

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

1 In the Matter of:

2 IE TMI INVESTIGATION INTERVIEW

3 of W. Scott Wilkerson
4 Engineer II, Nuclear

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

11
12 May 16, 1979

(Date of Interview)

13 July 9, 1979

(Date Transcript Typed)

14 201 and 202

(Tape Number(s))

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21 NRC PERSONNEL:

22 Thomas H. Essig
23 Dorwin R. Hunter
24 Tracy Binion
25 John R. Sinclair

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1 SINCLAIR: The following interview is being conducted of Mr. W. Scott
2 Wilkerson. Mr. Wilkerson is an engineer II-nuclear, Three Mile Island
3 Nuclear Power Facility. The present time is 5:02 p.m., eastern daylight
4 time. Today's date is May 16th, 1979. The place of the interview is
5 trailer 203 which is located immediately outside the south gate to the TMI
6 site. Individuals present for the interview will be interviewers Mr.
7 Thomas H. Essig. Mr. Essig is a chief Environmental and Special Projects
8 Section Region III USNRC. Also interviewing will be Mr. Dorwin R. Hunter.
9 Mr. Hunter is inspection specialist, Performance Appraisal Branch, I&E
10 Reactor Construction Inspection. Also present during the interview will be
11 Miss Tracy Binion, Inspector Auditor, Office of Inspector & Auditor USNRC.
12 My name is John R. Sinclair. I am an investigator, Office of Inspector &
13 Auditor, US Nuclear Regulatory Commission. Prior to the interview being
14 recorded Mr. Wilkerson was provided a copy of a document explaining his
15 rights concerning the information to be obtained regarding the incident at
16 Three Mile Island. In addition, Mr. Wilkerson was apprised of the purpose
17 of the investigation, its scope, and the authority by which Congress author-
18 izes the Nuclear Regulatory Commission to conduct an investigation. On the
19 second page of the advisement document, Mr. Wilkerson has answered three
20 questions. The questions and Mr. Wilkerson's replies will now be recorded
21 as part of the interview. Mr. Wilkerson did you understand the document?

22
23 WILKERSON: Yes, I did
24
25

1 SINCLAIR: Thank you. Second question, do we have permission to tape the
2 interview?

3
4 WILKERSON: Yes

5
6 SINCLAIR: Thank you. Third question, do you want a copy of the tape or
7 transcripts?

8
9 WILKERSON: Yes.

10
11 SINCLAIR: Ok, thank you. At this point we would like to briefly have you
12 give us a little of your background or training as it relates to the nuclear
13 industry.

14
15 WILKERSON: I graduated from Rensselaer Polytechnic Institute in 1976 with
16 a BS degree in nuclear engineering. I took employment with Metropolitan
17 Edison in the plant performance and engineering group in September of 1976.
18 I worked in that group for approximately 3 months before they reorganized
19 the structure of the corporate group at which time I went into the nuclear
20 fuels group. I worked in the nuclear fuels group from approximately December
21 1976 until January 1979, at which time I was transferred down here to work
22 as a nuclear engineer for Unit I.

23
24 SINCLAIR: Ok, thank you. At this point we will turn the interview to Mr.
25 Essig.

1 ESSIG: Mr. Wilkerson what we would like to do with you today is to go
2 through, walk through with you as best you can, your involvement in the
3 assessment of actions that took place following the event of 0400 on March
4 28, 1979 at Three Mile Island, Unit II. What we would like you to do as
5 best you can is to tell us when you arrived onsite and just sort of walk
6 through all your actions that you took as best you recall, persons you
7 dealt with, what types of calculations you were asked to make, various
8 types of assessments you were asked to make, assistance that you provided
9 to others, any of this type thing or any actions that you may have directed
10 others to do. We would like you to go through that as best that you can
11 recall and where you can we would like you to pin it down in terms of the
12 time. We recognize now that its the 16th of May and we are talking about
13 an event that happened on the 28th of March and your recollection may be a
14 little fuzzy, but we ask you to do the best you can. At this point I would
15 like to turn it over to you and tell us where you were on the morning of
16 March 28 and carry it up through the 30th. We may interrupt as the need
17 arises with questions that we want to key a particular point; others, we
18 may just leave. If you look like you are flowing fairly well, we may just
19 leave things go right till the end. Okay?

20
21 WILKERSON: Prior to the Unit 2 trip, I was down at Unit 1 in preparation
22 for physics testing for Unit 1. After the Unit 2 trip, I was informed by
23 somebody that we'd had a turbine trip down at Unit 2. So I proceeded over
24 to Unit 2 just to follow up and take data from the normal trip review. So
25 I went over to Unit 2 and I got over there approximately 5 or 10 minutes

1 after the trip and generally just sat back and watched, looked at the data
2 as it came off of the recorders for post trip review, just to collect the
3 data using the nuc engineers put together trip reports here. When it
4 finally came out I looked at things, noticed what had happened as far as
5 normal sequence of events. I made a copy of that post trip review and, in
6 general, kind of watched what was going on. A little bit after that I went
7 up to check to make sure that all the rods had gone in, checked the present
8 boron concentration and performed assessment of our subcriticality shutdown
9 margin. Upon doing that for the most of the next half hour or so just kind
10 of went around and watched and listened to other people as they were working
11 trying to control the pressure and the temperatures of the normal post trip
12 type of efforts. Pretty much I stayed uninvolved during the first hour or
13 so with what was actually going on, other than like I said to take a look
14 at the post trip review, to notice that the feed pumps had tripped, the
15 reactor tripped, and the turbine tripped, and, you know, just to look at
16 things that happened. The emergency feed pumps had come on and I come in
17 there a little, about 10 or 15 minutes after the initial trip. I went back
18 over and was filling out sheets for shutdown margins calculations and
19 little things like that. I can't remember what time, but at one time one
20 of the shift supervisors that was on duty at the time ask me to give a
21 number of people a call. At the time, knowing my memory the way it is, I
22 wrote down who I called and what they said and what time it was called at.
23 As to what happened to those sheets of tablet paper I really couldn't tell
24 you. I don't know. It was about, the first phone calls I made were about
25 as I remember about 5 o'clock or a little bit afterwards. And that was to

1 people such as Joe Logan, just higher operation's personnel and that was
2 because at the time I guessed we noticed that there was some steam in the
3 building and things just weren't perfectly normal, ok. They were calling
4 other people and make assessments of what was going on. Between, some time
5 between 5 and a little bit after 6 in the morning, again I can't pin down
6 exact times, Mike Ross had arrived to come over and asked me if I had done
7 a shutdown margin. I said yes, we are shutdown considerably, naturally one
8 stuck rod which didn't stick in at ... all the other shutdown margin calcu-
9 lations. And he disappeared again. A little bit later, he came back
10 asking the same questions he said because he noticed the source and inter-
11 mediate ranges had come back on scale at the time. So I went over and took
12 a look at the recordings and graphs and noticed that indeed, they had come
13 up on, checked all the calculations for shutdown; tried to figure out any
14 way that there could have been a recurrent criticality event looking at the
15 temperatures and the boron concentrations. And it didn't appear that there
16 was anything that could have caused it ... an actual criticality. At
17 this time, they were already borating and the rods were in. So as far as
18 what else you would have done if it would have been a criticality, we were
19 in the processing of doing, and so, not knowing what caused their indication,
20 they were doing what I would have expected to be doing if it had been
21 indeed a criticality. Also in the same time span here between 5 and 6,
22 George Kunder asked me to call all his lead engineers. We contacted them
23 and asked them to come in early. Not, the tone at the time wasn't one of
24 dire emergency but was, one of things aren't exactly as they are, we are
25 probably going to have to assess what's happened. He wanted his engineers

1 in there early that morning so that they could get all the data they were
2 going to need and keep things smooth. I guess that goes to about 6. In
3 between a quarter after six, six thirty, a lot of stuff went on concerning
4 the charge feedback on scale, back checked the procedures, check the data
5 to make sure everything was correct. Had some boron samples drawn to
6 verify the boron concentration. They showed the boron lower than it would
7 have been, ... was supposed to be in the vessel which was low like 700 and
8 400 ... samples taken almost immediately after one another. Again even
9 with those samples, the thing was shutdown. It didn't explain any, it
10 didn't explain an apparent recriticality. And some people thought, we knew
11 the temperatures were hot, considered what effect the voids might have, not
12 voids like in covering voids but two phase voids of some sort or another.
13 That type of thing might cross your mind, would have had on criticality,
14 No, that wasn't going to increase that was going to decrease it, if anything.
15 Again, people put out all sorts of other different theories at that time if
16 it was actually criticality, how it could have been caused. When they, I
17 guess the next step and one thing I do remember was the first time they
18 attempted to start a pump, I can't tell you what pump it was or exactly
19 what time it was. My concern at the time was the intermediate and source
20 range indications and concurrent with that start up, with that attempt, the
21 turning of the switch, the instrument and source range dropped right back
22 off scale, back down to where they were prior to the, immediately after the
23 trip, range. They didn't explain why they were up there but it took away
24 part of the immediate concern about criticality concerning it, at least in
25 my mind as far as criticality was concerned. Then after that, I went over

1 zeroxed some more data that was being printed out on the recorder, different
2 sections of the post trip review; finished up some of the criticality,
3 subcritical calculations based upon the new boron samples that they brought
4 out; and then, the time between that time and the time at which they declared
5 it a general emergency, again it was more or less sitting back watching
6 what was being done. I wasn't recording what was happening. I was just
7 kind of listening out of my own interest. I guess at about a little bit
8 before seven, I am not sure exactly what time it was. I heard concern
9 about radiation levels down at hot machine shop in Unit 1, and a site
10 emergency was declared by the supervisors and superintendent that were
11 there at the time. Let's see what happened after that. I believe at that
12 time, or it was a little bit later, but again here at this particular
13 sequence of time again between say 7 and again 7:30 what I more or less did
14 was stay out of peoples' way that were very busy running around setting up
15 tables, putting up charts. I had been here for about, at the time I had
16 been here for about three months, and I myself have not gone through an
17 emergency drill here at the site. And at 7:20, 7:30, two of the other nuc
18 engineers here from TMI come in the morning. One of them had been called
19 in, in fact, he came in a little earlier than that, before 7 or right
20 around 7. He is one of the engineers that I called when I called the lead
21 engineers in Unit 2. They came in. They were there prior to, I believe,
22 the general emergency being declared. When that was declared my basic job
23 then became go over watch, HP214, HP219, the monitors. That's basically
24 what I did for the next 2 hours, 3 hours, that was in the control room.
25 Noted that, watched the monitors, reported when the monitors went up. When

1 I started watching the monitors, the HP214 was reading about 10^3 , I don't
2 remember where HP219 was, it was down on the scale. For the first half
3 hour, 20 minutes to 45 minutes I don't really remember any distinct movement
4 of the monitors but some where in that time span HP219 I know was moving
5 first. It went up, followed very quickly by 214 which very steadily increased
6 until it stopped out at about 5×10^5 . There's an indication on the reading
7 and I don't know where PH219, offhand, I don't remember where it stopped. I
8 was relaying this information back to Howard Crawford and Mike Benson, who
9 were over at the, with the maps doing source terms, dose calculations type
10 of information. I was not involved in the emergency plan calls which were
11 made. Although I did make calls early in the morning to Med Ed personnel
12 to ask them to come in. I made some calls to the incoming shift supervisor,
13 lead engineers, I don't remember. I wrote it down, if anybody ever finds
14 the piece of paper that I recorded when and whom I contacted. And the rest
15 of that morning, I had been there since the night before at about 11 o'clock
16 for the physics tests on the night shift for Unit 1, and when they started
17 having concerns about airborne in the Unit 2 area in the reactor building,
18 at that time I had a beard and I was tired. I went home about 11 or 12
19 o'clock that day. I left the site.

20
21 HUNTER: Did you shave while you were home?

22
23 WILKERSON: The next day I came to work. I brought my razor and my shaving
24 cream with me although I hadn't shaved, I had really hoped when I had
25 gotten home, I called in at about 9 o'clock that night to ask what was

1 going on and how things were. I myself had expected things to have been
2 settled down much more than they were.

3
4 HUNTER: You indicated that you were watching HP214 and 219 and you were
5 supplying data to Howard Crawford and Mike Bensen. Did you do any calcula-
6 tions yourself or basically you were feeding information?

7
8 WILKERSON: Not that day.

9
10 ESSIG: You indicated that the HPR214 was reading about 10^3 .

11
12 WILKERSON: Well, I picked it up, yes.

13
14 ESSIG: Would you, do you recall about what time that was?

15
16 WILKERSON: It was probably about an half after the general emergency was
17 declared.

18
19 ESSIG: Ok, so around ten of eight or five of eight, somewhere in there.

20
21 WILKERSON: Yes.

22
23 ESSIG: And what were the units on that 10^3 ?

1 WILKERSON: Millirem per hour, however, there is a shield over the detector.

2
3 ESSIG: Were you relaying the reading on that monitor directly as you got
4 it off the monitor to Mr. Crawford?

5
6 WILKERSON: As it changed. I was where I could turn around and speak
7 across the room to him.

8
9 ESSIG: Okay, and the value you gave him was actually the monitor readings
10 in terms of mR/hr?

11
12 WILKERSON: Yes, It would have been the monitor reading.

13
14 ESSIG: Ok, then he had to then take, as I understand it, because I have
15 already interviewed him, he apparently then had to take the reading that
16 you gave him and convert that mentally to R/hr so that it could be used
17 with the procedure 1670.4 which is the offsite dose calculation procedure.
18 Is that about how it went?

19
20 WILKERSON: That's how I understand it, yea.

21
22 ESSIG: Ok. You said HPR219 at the time that you first noted HPR214 to be
23 about 10^3 mR/hr and 219 was roughly normal? Or what ...?
24
25

1 WILKERSON: I don't know what normal would be on that ... on the instrument.
2 It's the first time I ever looked at the radiation monitor instruments
3 around here. If I remember correctly it was less than half scale and thats
4 about all that I can give you on it.

5
6 ESSIG: Did you attempt to roll back the chart to see what it might have
7 been?

8
9 WILKERSON: No, I was directed by Dick Dubiel at the time, just to go over
10 and monitor them and notify of any changes that occur. And that's what
11 exactly what I did. I just set there staring up at the tube, monitors
12 between the tube.

13
14 ESSIG: And then you proceeded to do that the rest of the day then?

15
16 WILKERSON: That is pretty much what I did the rest of the day that I
17 stayed there. Like I said I had been there the night before, and I left
18 that day to go home. I left the control room. I don't know if the other
19 people, another of us left about the same time. I don't know if it was 10
20 thirty or 11 o'clock, but it was right around that region of time. We left
21 about the time that the first people were leaving the site. I believe we
22 were in the north auditorium. We were the last of the people that left the
23 site from the north auditorium, the collection area, we were to call it.
24
25

1 ESSIG: Ok, so you would have been watching that monitor then from roughly
2 a little bit before eight until sometime before you went home about 11
3 o'clock?

4
5 WILKERSON: About 10:30.

6
7 ESSIG: Ten thirty, so two and one half hours worth. Do you recall in that
8 period of time what the highest level was you saw on that HPR214?

9
10 WILKERSON: 6×10^5 , it went up there very rapidly when I first saw it move
11 and it went very steadily through 10^4 , 10^5 it went, then you could watch
12 the needle move. And it peaked out about 5×10^5 and then it kind of edged
13 up a little bit more and I never saw it move past that. The last time I
14 noticed, it didn't move anywhere.

15
16 ESSIG: Ok, and it did this fairly rapidly?

17
18 WILKERSON: When it went up, when it started moving from the 10^3 it went up
19 fairly rapidly. what I mean by that is noticeable, you could sit there and
20 watch the needle move and it didn't matter really whether it was 10^3 or
21 10^4 scale, you could see it move.

22
23 ESSIG: Ok, and you were relaying or attempting to relay as it was increasing?
24
25

1 WILKERSON: I told him it was increasing and like I said it was very steady,
2 it went up, stopped, and then it would go up, that's where it is now, and
3 told him what the new reading was essentially. They probably wasn't two
4 minutes, four minutes, I don't how quickly time goes when you're thinking
5 like we were at the time but probably no more than two minutes it took to
6 make the whole transition from where it was in the center of the scale to
7 the top of the scale.

8
9 ESSIG: And did this transition occur within probably the first hour that
10 you ... that you looked at it?

11
12 WILKERSON: Watched it, yes.

13
14 ESSIG: Within the first half hour, perhaps?

15
16 WILKERSON: No, I don't think so. Then again as far as when I actually
17 started watching it, it was probably a half hour. It wasn't immediately
18 after general emergency. Some other people were over there working with
19 the meters, probably Dick Dubiel, when they started to get busy with other
20 things, they asked me to go over and take care of that particular job. And
21 I believe it was about a half hour maybe 45 minutes after the initial decla-
22 ration. Again I am really not, unfortunately, I wasn't sitting back and
23 taking notes, although I could curse myself for not doing it. I can't give
24 you time sequences very good.
25

1 ESSIG: That happens a lot to everybody. Don't feel badly about it because
2 as I said earlier that it's been a little while ago since this happened and
3 we are just depending on your recall. We would like as best you can to pin
4 down the times because then we will put these, match these up against other
5 peoples' times and maybe two or three people to agree to decide on the
6 time. Ok, so we got the HPR214 stating off at about 10^3 mR/hr when you
7 first started watching and within about a half to three quarters of a hour
8 it increased fairly steadily and then leveled off at about 6×10^5 mR/hr.

9
10 WILKERSON: Yea, that's what I remember.

11
12 ESSIG: Ok, now that reading. I just want to make, ask you one other
13 clarifying question on that particular one. As I understand it, the true
14 exposure rate then in containment is the factor of 100 above that. Is this
15 the actual shielded monitor reading. Is that correct?

16
17 WILKERSON: To make it even simpler, at the time I was reading the instrument
18 I did not know that there was a shield over the instrument. So what I read
19 was what was on the instrument face.

20
21 ESSIG: Ok

22
23 WILKERSON: When I first started looking at it. I mean later on somebody
24 told me, we went through the whole bit about it being a shielded detector
25 and you know that morning, we went through it that evening. But when I

1 first starting reading it and the readings that I relayed were instrument
2 readings off the face of the detector.

3
4 ESSIG: We have taken you now through the first day, through your first
5 day, which ended about 11 o'clock or so on the 29th. Then you came back in
6 at about what time? Would have been that Thursday evening? Would you pick
7 it up from there?

8
9 WILKERSON: Wednesday evening about 9 o'clock or so I gave a call into Unit
10 1 control room which ... that is ... when I left They moved the ECS
11 from Unit 2 to Unit 1. I am sure you have that time probably pretty close.
12 I came over with that to Unit 1 and then stayed there 5 or 10 minutes and
13 proceeded down and out from the site. About nine o'clock that night I gave
14 a call into Unit 1 control room just to see how things were going. At
15 which time I was told that things hadn't straightened out yet. I don't
16 think we had pumps running. All I remember is the conversation I had which
17 just merely was that things weren't settled yet at the time. And in the
18 next, I went to sleep. The next morning, I came into the observation
19 center. I got there about 8 o'clock that morning, spent time there in the
20 morning making calls, contacting people from (I can't remember the name)
21 but one of the labs that provide this monitoring equipment the first day.
22 Try and tell exactly when was it going to get here and the people that own
23 the whole body counter. Trying to get everything located so that we could
24 use their equipment. I did that early in the morning, I did a little odds
25 and ends, I

1 ESSIG: Excuse me. This would have been on Friday then, the 30th?

2
3 WILKERSON: This was Thursday. It was the next day. I went home Wednesday
4 at 11 o'clock in the morning, went to sleep essentially. Came in the next
5 morning at 8 o'clock on Thursday. Went over to the observation center,
6 made some contacts with Radiation Monitoring Services, I think that's the
7 people, RMC

8
9 ESSIG: Radiation Management Corporation.

10
11 WILKERSON: Yes, that's it.

12
13 HUNTER: Ok, Helgeson. You say you contacted the whole body counter people?

14
15 WILKERSON: Yes.

16
17 HUNTER: Ok.

18
19 WILKERSON: Then I set down at the table that they had put together there.
20 Did some little work with mapping on the maps they had keeping track of the
21 onsite radiation levels, on the plastic enclosed maps of the site. Showed
22 locations GE-1 through GE-10 on those maps.

23
24 SINCLAIR: Let me break in here, the time is 5:31 p.m., and we are going to
25 break and change the tape.

1 SINCLAIR: The time is now 5:32 p.m. We will continue with the interview
2 with Mr. Wilkerson.

3
4 WILKERSON: About 12:00 or 1:00 that day, whatever, we talked with the Unit
5 1 over the radio. I went and shaved my beard that I had and proceeded to
6 come onsite. I came onsite approximately 3:00 that day, and went up to the
7 Unit 1 control room to relieve Mike Benson who was directing and monitoring
8 the offsite radiation reading in the teams. I worked in conjunction with
9 Mike for approximately 3 hours or so. I believe he left there around six,
10 maybe a little bit after six, by the time he finally left the control room.
11 At which time I started keeping track of the winds, which direction they
12 were blowing, the intensities, directing the monitoring teams or providing
13 direction to the person who was on the phone as to where to send the moni-
14 toring teams or, keeping track of results, passing them on to the Bureau of
15 Rad Health. And that was pretty much what I did straight through for 8
16 hours, until I got my relief the next morning, through that night. I did
17 do some source term calculations as per the procedure which Med Ed has
18 depending upon the wind class, the velocity and most of the source terms
19 that we did were essentially back-calculated source terms. Essentially,
20 let me clarify that a little bit as far as what was done there usually was
21 in trying to get a estimate of the source term coming out of the stack, or
22 coming from wherever it could have been coming from the island. Generally
23 what was done was when I was working there was a helicopter would be plume
24 modium, mapping essentially. They were taking the highest plume readings
25 that they could determine. Taking the worst case of X/Q value from the

1 isoplots of X/Qs they had and backfitting out for a source term. And that
2 pretty much takes care of what I did that day, what I did the next day. If
3 you have any particular questions I can answer them but it was the same
4 type of thing, keeping track of winds, readings, and passing them on to the
5 Pennsylvania Department.

6
7 ESSIG: You indicated that you had not been through a drill before and that
8 you had gone over with Mike Benson what you were doing for about a 3 hour
9 period. Would you, did you have any indoctrination or training in addition
10 to that either prior to that time or subsequent to that time that you were
11 being provided?

12
13 WILKERSON: In particular to Unit 1, Unit 2, TMI?

14
15 ESSIG: In regard to the implementation let's say of this procedure that we
16 were discussing earlier 1670.4 which covers the offsite dose assessment.

17
18 WILKERSON: No

19
20 ESSIG: Ok, so you were resequencing events

21
22 WILKERSON: What I got as for as briefing was the three and a half hours
23 that Mike and I worked together. Mike Benson.

1 ESSIG: Ok. The times that the, let me haul out the survey sheets here,
2 probably a little easier to speak from. I have in front of me, for the
3 record, the copies of the log maintained at the emergency control station
4 which is a calculation of all the survey, offsite survey results that came
5 in over the radio. And the question that I have on this survey log, since
6 you were involved with this on the second and third day. Is the time that
7 is recorded here the time that the survey was performed or the time the
8 result was received via the radio.

9
10 WILKERSON: What was being done on the first day, was that as the teams got
11 the readings, they relayed them. So in other words if the teams was at a
12 location GE-10, they were saying - I am at GE-10 reading so many millirem
13 per/hr and the time was recorded by control room operator. Whoever was up
14 there, not the CR ok, but who was operating the phone in the control room.
15 So at those times that they reported back immediately they gave us a reading
16 as they got them. For the times which they were out of radio contact
17 during those first few days, times that I remember they used the times that
18 they took their readings at.

19
20 ESSIG: Ok, so for the first day then the measurements were relayed via
21 radio when they got them. So the time was jotted down and would the
22 person making the survey say something like I'm at GE10 and the dose rate
23 is 3 mR/hr and the 3 mR/hr is as of, ok what 1015 or something like that?
24
25

1 WILKERSON: Ok, only go for what ... the times that I was over there working
2 near the radio, because I did not work the radio that day. But all the
3 readings were coming and the best I could tell you is as they were taking
4 the readings they were relaying them. I not sure if the person who gave
5 the readings said at such a such a time, or if their watch might have been
6 different from the control room clock or whether or not the radio operator
7 was jotting down the control room time. We know that they were jotting
8 down control room times, many times. And so I believe that that's how the
9 times were set. They were in accordance with, when I turned around and
10 they gave me their little slip of paper they recorded on, at which time I
11 put in the book and looked at the maps and the winds. They did seem to me
12 very close to the time.

13
14 ESSIG: In looking at this same log, this survey log, it appears that
15 during the first day, I've just gone through and tallied the number of air
16 samples that were collected and it appears that there were something on the
17 order of 22 air samples collected during the first day. And in going to
18 the second and third days, it appears like there were, at least according
19 to this record that there were only about 2 collected each day. Now I know
20 from other information that there were additional samples that were collected.
21 Can you explain what it appears to be a discrepancy? Why were the fact
22 that a sample was collected or why was that fact not recorded by the ECS?

23
24 WILKERSON: Actually what we were doing as far as recording were recording
25 monitoring readings, and that's when I started working and when I continued

1 working. We had been taking air samples wherever they had hot spots. If
2 they were going to take an air sample, we had them take it, if the downwind
3 team, had them take one where the center of the plume was felt to be. At
4 the same time if we had a team on the other shore they would take an air
5 sample any how some where to record what isn't there essentially. And we
6 did not record when the samples were taken on a sheet, you might see the
7 first two days samples, I noticed when I looked at them, when I got there
8 that they had numbers on them. I assumed that they were taken with some
9 one of the equipment which essentially gives you a immediate readout of
10 iodine levels.

11
12 ESSIG: Would this be the Eberline Sam-2?

13
14 WILKERSON: I don't know.

15
16 ESSIG: Okay.

17
18 WILKERSON: But as far as why we no longer recorded them, I don't think
19 they ever were recorded. It wasn't until later on that we started recording
20 where and when an air sample was taken. Earlier what we recorded were
21 readings that were relayed over the radio. I assumed that those readings
22 of iodine levels on the first day were probably relayed over the radio by
23 the team which had sampling equipment with them, for immediate readout
24 type of sampling. That probably explains why, I don't know why they switched
25 from immediate readout to air samples. I assume the air samples, as I

1 understand it, are more accurate for actual numbers, although the portable
2 monitors work. I don't know if we had problems with the monitors. I
3 really don't know why they switched from one to the other type of reading.
4 They may have put them in control rooms or some place where they felt they
5 needed more efficient, quicker response to level readings.

6
7 ESSIG: Was Mr. Sidney Porter of Porter-Gertz Consultants in the emergency
8 control station at the time that you were there on the second and third
9 day? Or do you know Mr. Porter?

10
11 WILKERSON: I know Sid Porter. I saw him from time to time. I could not
12 tell you what time, what day, that I saw him there. I did not myself work
13 with him, ok so he was just another person that was in the control room.
14 No, since I really don't have any good recollection of what times, I really
15 don't know what was the first day I saw him there.

16
17 ESSIG: Do you recall who was in charge of the emergency control station at
18 the time you were there on the second and third day?

19
20 WILKERSON: Lex Tsaggaris, the ECS coordinator when I was working there,
21 the first couple of days. I realize it then changed off when people changed
22 shifts.

23
24 ESSIG: Was Mr. Bill Potts there also?
25

1 WILKERSON: Bill Potts was also there.

2
3 ESSIG: Was he there at the time you were?

4
5 WILKERSON: No, in fact he, I really cannot tell you for sure if he was
6 there when I first came in. I don't remember him. I do know that when we,
7 like the second, no, he was not on the shift I was on. When I was going to
8 go to the shift that he was on, that Bill Potts was on ECS, he went to Unit
9 2. So I never did work directly with him, maybe a little bit during shift
10 changeover. He was around, but generally the person I was working with was
11 ECS coordinator, Lex Tsaggaris

12
13 ESSIG: Ok, what type of direction was Mr. Tsaggaris giving you?

14
15 WILKERSON: The main direction he wanted to know, and keeping track of it
16 was the wind shifts, any radiation level readings which were higher than
17 previous readings, and to keep the on and offsite maps updated as to what
18 the levels were. And that's, during those first few days, that's the
19 information that we relayed and that was about it.

20
21 ESSIG: I would like to go back to the very first day, realizing that you
22 may have not been involved with this has heavily as you were the second and
23 third day. I would like to just ask you a question anyway and see if you
24 can perhaps help me. The ECS log sheets that I have for the first day
25 appear to start, the times are somewhat out of order, but they appear to

1 start at about 08:42 in Goldsboro, with being the first survey on March
2 28th. I know from other information that they were some earlier surveys
3 actually made on the island at the various points that you have already
4 mentioned, that you gave 10, 1, 2 and so on. Do you know where these
5 particular survey results may have ended up?

6
7 WILKERSON: I believe I do know where some of what you are looking would be
8 and as to where it is right at the moment all of the slips of paper that
9 were filled in the later days, all of the calculational sheets that were
10 used like during the first day from the monitors to determine what would be
11 the dose, taking worst case, leakage rates and this type of thing, downwind,
12 were kept in the box in two or three plastic bags and they were kept up in
13 ECS. They may even still be up in Unit 1 control room at this moment. In
14 there as part of the procedure for calculating potential dosage rates were
15 the readings that were given. Something was done based upon the stack
16 readings and the dome monitor readings. It was compared to what action was
17 being found downwind, it was being used to buffer against the two of them,
18 to try to come with a actual type of release rate. A lot of things are
19 done on a worst case, release rates, maximum for the Reactor Building,
20 which would have been at, 55 pounds. That type of calculations. On those
21 sheets you should be able to find some of the earlier readings, as far as
22 whether or not anything earlier was recorded down on paper, I don't know.

23
24 ESSIG: You indicated earlier that with respect to the source term calcula-
25 tion and the offsite dose assessment that, and this would be the assessment

1 that's outlined in procedure 1670.4, you indicated that the calculation was
2 run backwards at least during the second and third day. That is the offsite,
3 if I understood what you were saying correctly, the dose rate measured
4 offsite would be backed up through the atmospheric dispersion parameter X/Q
5 to give an apparent source term then which would have resulted in that
6 offsite dose rate. Is that correct?

7
8 WILKERSON: That was being done in that manner by the individuals working
9 with radiation monitoring teams. Again my understanding at the time was
10 also that there were other people involved with calculating source terms
11 based upon monitor readings and flow rates and documenting that type of
12 information.

13
14 ESSIG: Were you involved with that particular calculation of the calcu-
15 lations of source terms from which then a estimate could be made of the
16 offsite dose rate for comparison with the measured values?

17
18 WILKERSON: No, I don't believe I ever did one that faced that direction.
19 The only one that I was a party to was the ones that were done the very
20 first day in the morning at which time I essentially watched what was being
21 done based upon monitor readings and, like I said, the procedures sets out
22 and calculates potential down site readings.

23
24 ESSIG: This one in particular would involve the use of the HPR214.
25

1 WILKERSON: Yes

2
3 ESSIG: That dose rate which gives then a noble gas rate release in terms
4 of curies per second which then can be used with a procedure to estimate an
5 offsite dose rate. Do you recall what some of those early estimates were
6 that you were sort of watching as you said.

7
8 WILKERSON: No

9
10 ESSIG: Dorwin, if you have any questions at moment would you go ahead? I
11 will come back to some others that I have here.

12
13 HUNTER: I want to pick a couple of items. You left early in the morning,
14 you ended up in Unit 2 with the word in the turbine trip reactor trip and
15 you pulled off data off the post trip review, the computer. Did you know
16 anything different from this trip than any other trip that you looked at in
17 Unit 1 or 2?

18
19 WILKERSON: No

20
21 HUNTER: Did you get involved at that depth? Were you just taking the
22 data?

23
24 WILKERSON: Actually all I did was taking the data off, looking at, looking
25 at the points and saying, at first, first my information was a mid turbine

1 trip. I actually went over to Unit 2 to see how the reactor was behaving
2 in response to the turbine trip. Supposedly it will run back and maintain
3 at 15 percent power. And at which time I got over there, looked at the
4 first parts of the trip, not the ... the sequence of events log and noticed
5 that the feed pumps had tripped and nine seconds later or 10 seconds later
6 the reactor had tripped and that type of information. When I looked at the
7 post trip review, nothing really seemed out of the ordinary. I didn't even
8 know that feedwater was initiated some 8 minutes later. When I came in I
9 looked at the things for, like feedwater pump discharge pressure and saw
10 1200 lbs of pressure. That's good, which you expect to come up and go on
11 and expect pressure to drop. When I came in they were working with the RCS
12 pressure along with the cooling temperatures.

13
14 HUNTER: You noted the ... you noted the all rods in

15
16 WILKERSON: Yes.

17
18 HUNTER: By what, looking at the panel?

19
20 WILKERSON: That was going over and looking at the panel.

21
22 HUNTER: Ok, did you get involved in pulling reactivity, or data or did
23 they pull that later?
24
25

1 WILKERSON: No, I did not. They pulled that, as far as I know, much later.

2
3 HUNTER: You indicate that you did an early shutdown margin test, shutdown
4 margin procedure calculation. Do you recall what the shutdown margin was?

5
6 WILKERSON: If I remember correctly it was 8, 9 or 10 percent of that
7 region.

8
9 HUNTER: That's a normal shutdown margin with all rods in after a unit
10 trip?

11
12 WILKERSON: For Unit 2 for instance we are required to have a 2 percent
13 shutdown by tech spec. In addition there is a stuck rod which is almost
14 worth 4 percent. So I wasn't surprised to see something well over 6 percent.

15
16 HUNTER: You indicated then that you were basically watching the events.
17 Bill Zewe was there, the shift supervisor.

18
19 WILKERSON: Yes he was.

20
21 HUNTER: Ed Frederick was on the make up panel. By time you got there
22 Craig Faust was on the emergency feed pumps.

23
24 WILKERSON: Ok, actually I don't know the names of the operators.
25

1 HUNTER: Just make sure you know, I'm giving you an idea of who was there
2 and did you walk over and look at the panel? Particularly the pressurizer
3 level?

4
5 WILKERSON: Ok, I did not look at pressurizer level. I looked at things
6 like T_{av} , RC pressure, source and intermediate range indications. And I
7 said things were changing. I didn't think it was unusual that pressure was
8 dropping, the fault in the reactor trip and associated cooldown when I was
9 looking at it. But I really wasn't, I was letting the SRO's and CRC's who
10 are trained to do the work. Keeping out of the way out of the panel.

11
12 HUNTER: Have you had any reactor operating training on Unit 2 or Unit 1?

13
14 WILKERSON: No, all that I have ever received, okay, I received startup
15 certification, you know, a week down at the simulator at B&W.

16
17 HUNTER: Ok, do you recall talking with George Kunder at all.

18
19 WILKERSON: I mean he did, I don't know if I called George in the morning
20 and called him in. I did make most of the phone calls that were made
21 between 5 and 6 o'clock. George did ask me to call some other people. He
22 gave me a list of people, like oncoming shift supervisor and Mike Ross. I
23 don't know if he gave me Mike Ross at the time but Mike was already on his
24 way. A number of people I really couldn't tell you who they were or exactly
25 what time they were contacted. The only person that I contacted that

1 wasn't available was Jim Floyd, and it was because as I understand it he
2 was down in Lynchburg at the time. His wife told me he wasn't there.

3
4 HUNTER: The next, that was the activity they asked you to be involved in
5 as far as phone calls, you did a shutdown margin. Then, you indicated that
6 you went back and did another shutdown margin calculation later. Do you
7 recall the shutdown margin at that time?

8
9 WILKERSON: It was the same exact type of thing, I mean I just looked over
10 all the graphs again to make sure I read everthing right. Looked to see
11 how low boron would have to be to be critical. And it was like 150 or 200
12 ppm boron

13
14 HUNTER: With all rods in?

15
16 WILKERSON: Yes, to have gone critical again.

17
18 HUNTER: So except for the, well your understanding at that time was that
19 they had boron problem with the 300, 700 and 400 ppm.

20
21 WILKERSON: It seemed to me, yes they had some type of boron problem.
22 Whether or not it caused criticality didn't seem to be true.

23
24 HUNTER: You said you looked at the source range intermediate. Did you
25 look at them early on, like you came over right away from Unit 2, from Unit
1 to Unit 2 ... 10 after 4.? So did you look at them that early?

1 WILKERSON: Not probably 10 after 4. A little bit later, maybe another 10
2 minutes or so, and going over and looking at the instruments that were
3 there and looking at the panels and stuff just noted that the ranges,
4 things went off, you know, down range as I would expected them to go.

5
6 HUNTER: Ok, and then you indicated that you, in fact, looked at the source
7 ranges again later.

8
9 WILKERSON: Later when it was, I was told later on, I was asked by Mike
10 Ross to make sure, he wanted to know if I had done one. And I said yes I
11 had, they were shutdown. He came back a little bit later and said well,
12 you know, the intermediate and source range were back up on scale, at which
13 time yes I did go over and look at the, specifically, looked again at the
14 detectors.

15
16 HUNTER: The recorder is on the components up on the console, up on the ...?

17
18 WILKERSON: On the back panel console, the strip chart.

19
20 HUNTER: And they in fact did, the source range increased and the interme-
21 diate range did come on scale?

22
23 WILKERSON: Yes.

1 HUNTER: Did you and Mike Ross discuss that issue at that time?

2
3 WILKERSON: Discussed what possibly could have caused it, again I went back
4 to check to make sure. They said with a plant that runs all rods out, you
5 are required to have all sorts of shutdown margin anyhow. It seemed to me
6 that it would be shutdown, they were already in the process even then of
7 doing, if I remember correctly, borating. In other words the HPI was on
8 and it draws from a high boron source. We didn't really go into any deep
9 discussion as to why it could have done it.

10
11 HUNTER: Was George Kunder in that conversation discussing that issue or
12 Joe Logan?

13
14 WILKERSON: Not that I remember.

15
16 HUNTER: Just you and Mike Ross?

17
18 WILKERSON: It was just a short thing there. Mike was very busy at the
19 time.

20
21 HUNTER: You mentioned something about voids, formation of voids during
22 this particular period of time in or two phased liquid?

23
24 WILKERSON: In thinking about all the things that could happen to cause a
25 recriticality one of the considerations was since we had a very hot tempera-

1 ture in the hot legs at the time, was that, could you be getting some type
2 of nucleate boiling or something to give you other just moderator in the
3 core. And again the quick thought there was would that of caused a criti-
4 cality not was that happening. It's just the opposite effect, so that was
5 the last thought I gave as far as, myself, to that type of thing. Its just
6 a quick run down of other things which could have caused a recriticality
7 and end the result was I couldn't think of anything that would have caused
8 it but we were doing whatever we could do if it indeed was.

9
10 HUNTER: You indicated that during that time frame that higher pressure
11 injection was on?

12
13 WILKERSON: Thats the way I remember it.

14
15 HUNTER: Did you actually look at the makeup pumps and the high pressure
16 injection flows yourself?

17
18 WILKERSON: I remember it going on, being on, people talking about emergency
19 boration and that type of thing.

20
21 HUNTER: Then you were just watching what was going on?

22
23 WILKERSON: Essentially, yes.

1 HUNTER: Anything else? Anything about the emergency people folks not
2 being available? You indicated that you did not realize that until some-
3 time later?

4
5 WILKERSON: Sometime later, much later.

6
7 HUNTER: Much later the next day, maybe?

8
9 WILKERSON: Yes

10
11 HUNTER: Ok, so you weren't aware of that.

12
13 WILKERSON: I was surprised when somebody told me that. Like I said, the
14 two things I had done was going through the post trip and checking out what
15 this point was and what it was reading and did I expect it to do that;
16 analyze the feed pump; discharge pressure came right up from some low
17 reading to somewhere above 1,000. So I just assumed we had, my own assump-
18 tion at the time was that we had emergency feedwater.

19
20 HUNTER: We have ... that was 14 seconds?

21
22 WILKERSON: Is that right?

23
24 HUNTER: You had full pressure, line pressure, so that indicated that
25 everything was available as far as the feedwater system. Okay, Tom, I

1 ESSIG: I just have a few more questions. Again going back to the very,
2 your initial involvement the first day, I think we've already discussed the
3 procedure which is used to calculate the offsite dose rate based on the
4 source term. Were you involved in any of the discussions which I think
5 took place between Mr. Dubiel and Mr. Crawford with regard to the initial
6 prediction in Goldsboro which you say you don't recall what it was. Mr.
7 Crawford has told me that his initial prediction was about 40 R per hour at
8 Goldsboro.

9
10 WILKERSON: I remember that it was high but I didn't remember what it was.

11
12 ESSIG: The question I have is were you involved in any of the discussions
13 which took place between Mr. Dubiel and Crawford with regard to the source
14 term that, using the procedure, was coming up with? In other words, appar-
15 ently they were convinced that it was an over estimate because the contain-
16 ment pressure was only about around 2 psi and the table was prepared based
17 on containment pressure of about 55 psi and the leak rate of course was
18 quite a bit less.

19
20 WILKERSON: And maximum leak rates.

21
22 SINCLAIR: We are going to have to break here real quick. The time is 6:02
23 p.m. and we are going to have to break to change the tape. SINCLAIR: The
24 time is 6:03 p.m. We are now continuing the interview of Mr. Wilkerson.
25

1 ESSIG: I believe the question that I was exploring prior to our going to a
2 new tape was were you, Mr. Wilkerson, involved with the discussions between
3 Mr. Dubiel and Crawford with regard to the actual source term that the
4 procedure was predicting and maybe attempting to come with a correction to
5 that source term because at the time it was believed to be an overestimate.
6 Where you involved in any discussions of maybe how to adjust the source
7 term downward to correct the difference in containment leak rate which
8 might result from a lower containment of pressure?

9
10 WILKERSON: No I wasn't. The only thing that I did, was party to and that
11 was just a matter of listening not being involved in the conversation, was
12 the fact the rates or the building levels that we were talking about were
13 higher than those that were already tabled in the procedure and how they
14 were going to quickly come up with an appropriate source term.

15
16 ESSIG: Do you recall what was done to come up with that?

17
18 WILKERSON: No, I don't know.

19
20 ESSIG: Were you aware of any time during the three days that we are discus-
21 sing here when surveys, the direction of the survey teams, when that was
22 performed at a location other than from the ECS?

23
24 WILKERSON: No, I cannot remember any time. From the time I started until
25 the time I stopped working up in ECS, we were directing the radiation

1 monitoring teams. So I was telling them were to go, when to go, when to
2 take air samples. That was essentially the job that we did have to do.

3
4 ESSIG: Where you aware of any information which might have been made
5 available from your meteorological contractor Pickard, Low and Garrick with
6 respect to atmospheric dispersion, parameters X/Q values. Were those made
7 available to you in the ECS?

8
9 WILKERSON: They were made available, however they were past times, if you
10 know what I mean when we got it it was 8 o'clock in the morning or that
11 type of thing. Essentially all that I ever did was look at them and say,
12 gee did they agree with basically what we were using if we did the source
13 term at that time, for that direction. And the two or three that I looked
14 at they looked close, to me, and were pretty much the same by a factor of 2
15 or 3, within each other, that was used, that we used based off the plot
16 which would be more of a worst case than what they were actually getting.
17 And other than that the only time I did that was the first time we got and
18 them and wanted to know what to do with the sheets that were from 8 hours
19 before and I didn't really see what they were going to do for me. But we
20 did have a little bit and pass them on to Tom Potter, Sid Porter and some
21 other people that were working with the information.

22
23 ESSIG: Did anybody ask you to do anything with them or were they just
24 handed to you and you had to decide whether or not you were to do anything
25 with them?

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1 WILKERSON: At the time I got ahold of them they were given to me to be
2 passed to two or three other people. I looked through it because I had it
3 in my hand.

4
5 ESSIG: You indicated earlier that you were getting the wind direction
6 data. Where did you get that data?

7
8 WILKERSON: From the Unit 1 control room monitor. If you are facing the
9 panel it is on the left behind the main console.

10
11 ESSIG: What does that monitor provide to you?

12
13 WILKERSON: It gives you wind speed and direction, and also the one below
14 it provides Delta T stability class.

15
16 ESSIG: What, with respect to the use of the isoplats that you mentioned
17 before? These are the plastic overlays, I believe, which have the atmos-
18 pheric dispersion values, the X/Q values plotted on them. How did you
19 know which one of those to use?

20
21 WILKERSON: I used it at that time as per procedure depending upon the wind
22 class. And essentially there is in the system that TMI uses there is a
23 stable a neutral and unstable wind class, and there is all three. The
24 method upon determination was the wind spread as shown up on the monitor,
25 the wind directional changes. And that's what was used to determine which

1 plot to use and the appropriate plot was kept on the emergency map to be
2 used when people were maybe doing source terms. And also as another thing
3 that the ECS director would use just to keep track of the wind change and
4 stuff like that.

5
6 ESSIG: Did you use those isoplats at any time to actually verify a plume
7 width, did you direct a team for example to go out and make a cross-wind
8 survey and prepare say relative dose rate at point A versus point B and
9 then see if the X/Q isoplot would have predicted that the dose rate should
10 have different by that amount?

11
12 WILKERSON: I did not do that type of determination. The determination
13 that we would have done was to direct the team to travel north-south across
14 an east plume and get the readings and see indeed if they did drop right
15 off on the ground at the edge of the plume and that they were higher near
16 the center. As far as if they dropped off X percent for the first quarter
17 of a mile, then another percent for the next quarter of a mile, no I did
18 not do that. My main if you want to call it determination of the plume was
19 to make sure that the width of the plume was appropriate.

20
21 ESSIG: Did you at this, near as you can remember, find that it was about
22 what you expected?

23
24 WILKERSON: Yes, it was. I wasn't surprised at the readings that I got.
25 It maybe dropped off a little sooner than I expected. They went a little

1 bit longer than the exact map showed. But it was pretty close, the ones
2 that I did, you know.

3
4 ESSIG: Were you involved with directing the teams to when and where to
5 collect their samples on the second and third days?

6
7 WILKERSON: During the first couple of days I worked I really spent most of
8 my time going between the wind monitor, the map, recording readings, and
9 transferring them on to the State. Actual talking to the, I mean I know
10 that people would come in and say have air samples taken every hour and
11 pass it on to the people, we want air samples taken every 2 hours or every
12 3 hours at the time. I didn't go over and say "Take the reading here, take
13 a air sample here," that type of thing. I told them where to go take
14 readings but really wasn't giving definite direction as to when to take an
15 air sample. Later on as things settled down and less people where around
16 in ECS and started do more things and less things at the same time. By
17 that I mean we got a secretary in to transfer things on and record the book
18 and some other people left to do other things in Unit 1 and Unit 2. Then
19 we did definitely get involved very much with when to take a a r sample,
20 who to send it to, when to take it out that type of information. That
21 wasn't until a few days later, when things started to quiet a little bit.

22
23 ESSIG: Ok, I just want to look at my notes here for a second and see if
24 there is anything else I need to ask you at this time. I think I have
25 about exhausted my list of questions. Dorwin, were you

1 WILKERSON: I got one more comment too that I thought about.

2
3 ESSIG: Fine.

4
5 WILKERSON: John Flint, from B&W, came in that morning and one of the first
6 things that we discussed with him was the intermediate range and source
7 range, apparent criticality in the morning. And one of the things that he
8 put forth as a possibility at the time was that perhaps we had increased
9 leakage which was just showing up on the recorders. And the cause of
10 leakage being possibly some sort of void in the core region or the down-
11 comer region or somewhere between the detectors and fuel itself. The fact
12 that it went away when we started the pump and hadn't come back kind of
13 quieted any concern that I had at the moment with continuing problems, if
14 you understand what I am saying. That was just one little other tidbit to
15 add.

16 HUNTER: That discussion then appeared reasonable to you at the time.

17
18 WILKERSON: Yes it did.

19
20 HUNTER: And John Flint was in some where around 9:00 or so, I mean 9:30.
21 So would that be 9:30 or

22
23 WILKERSON: I seem to remember John Flint coming in much earlier than 9:00.
24
25

1 HUNTER: Ok, I will make sure. But then it appeared to be earlier to you
2 then. Okay.

3
4 WILKERSON: Maybe it wasn't, with everything going on it just seemed that
5 much sooner but that was one of the discussions we had when he first came
6 in. I guess that's about all that I have.

7
8 ESSIG: Scott I guess what we would like you to do since we are out of
9 questions that we had for you is to give you the opportunity if you wish to
10 make any remarks with regard to what you feel are lessons that we have
11 learned from this, the follow up evaluation that takes place following an
12 event of this type, or any comment that you would like to make either on
13 actions that you felt Med Ed could done better or that they could have been
14 better prepared for you either in terms of training, or particular type of
15 equipment that they should have had, or any involvement with NRC or other
16 offsite agencies that presented problems, or any comments that you would
17 like to make we would sure like to give you that opportunity now.

18
19 WILKERSON: Actually all the interfaces, a few interfaces that I did have
20 with the NRC or Pennsylvania Bureaus went smoothly as far as I could see.
21 And of course a lot of what I walked into was something that was set up
22 already. The only comment I have as far as things you can do better is
23 that it's so hard to get things documented straight and I think such about
24 things as these radiation monitor meters, one of the first things we had
25 such a hard time doing was making sure we kept all the date on things and

1 get the pages in order and I guess that is my one comment as far as things
2 of a long term. And that's about the only thing I can think really about
3 doing better is just better documentation while its being done even if it
4 causes things to go a little bit slower.

5
6 ESSIG: Were you satisfied with the radio communications that you had
7 available to you? Were you able to contact the offsite teams?

8
9 WILKERSON: They worked. Sometimes the batteries go dead, or go weak, and
10 you would have to get another battery out to the team. It would have been
11 nice if it had been like a telephone, but things seemed to have worked. I
12 wasn't dissatisfied with that. I thought the response that we got, like
13 the helicopter teams and stuff was very good. I can't think of anything
14 else to comment on. No, that's all I have.

15
16 SINCLAIR: Thank you, Mr. Wilkerson. We will conclude the interview at
17 this time. The time is 6:17 p.m., eastern daylight time. Today's date is
18 May 16, 1979.