

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

1 In the Matter of:

2 IE TMI INVESTIGATION INTERVIEW

3 of Lynn Owen Wright, Control Room Operator, Unit 2
4
5
6
7
8

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

13 May 9, 1979
14 (Date of Interview)

15 July 1, 1979
16 (Date Transcript Typed)

17 179
18 (Tape Number(s))
19
20
21

22 NRC PERSONNEL:
23 John R. Sinclair
24 Tim Martin
25

681 103

7908280680

1 SINCLAIR: The following interview is being conducted of Mr. Lynn Owen
2 Wright. Mr. Wright is a Control Room Operator, Unit 2, Three Mile
3 Island Nuclear Power Facility. The present time is 3:59 P.M., Eastern
4 Daylight Time. Today's date is May 9, 1979. Place of the interview is
5 Trailer 203, located immediately outside the South Gate to the Three
6 Mile Island site. The individual present for the interview will be Mr.
7 Tim Martin. Mr. Martin is an Inspection Specialist, Performance Appraisal
8 Branch, I&E Reactor Construction Inspection. My name is John R. Sinclair,
9 and I'm an Investigator, Office of Inspector and Auditor, U.S. Nuclear
10 Regulatory Commission. Prior to the interview being recorded, Mr.
11 Wright was provided a copy of the document explaining his rights concerning
12 information to be obtained regarding the Incident at Three Mile Island.
13 In addition, Mr. Wright was apprised of the purpose of the investigation,
14 the scope and the authority by which Congress authorizes the Nuclear
15 Regulatory Commission to conduct investigations. On the second page of
16 the document, Mr. Wright has answered three questions. Questions that
17 Mr. Wright's replies are now being recorded as part of the interview.
18 The first question Mr. Wright is: Do you understand the document?

19
20 WRIGHT: Yes.

21
22 SINCLAIR: The second, do we have your permission to tape the interview?
23
24
25

1 WRIGHT: Yes.

2
3 SINCLAIR: Third question, do you want a copy of the tape?

4
5 WRIGHT: Definitely.

6
7 SINCLAIR: Okay. The purpose of this investigation by the U.S. Nuclear
8 Regulatory Commission is to determine exactly what occurred regarding
9 the incident at Three Mile Island, Unit 2, which began on March 28,
10 1979, and the responding actions taken by Metropolitan Edison Company.
11 The investigation will include a review of the condition of the plant
12 prior to the incident and the period investigated will extend to 12:01
13 a.m. March 31, 1979.

14
15 You are asked to provide information in as much detail as you can recall
16 concerning your site-related activities during this period, including
17 your recommendations.

18
19 The U.S. Nuclear Regulatory Commission was given the responsibility and
20 authority by the Congress of the United States in the Atomic Energy Act
21 of 1954, as amended, and the Energy Reorganization Act of 1974, as
22 amended, to license nuclear power plants and to see they are operated
23 safely to protect the health and safety of the American Public. It is
24 from this Act and Title 10, Code of Federal Regulations, that the U.S.
25

1 Nuclear Regulatory Commission's Office of Inspection and Enforcement is
2 conducting this official investigation.
3

4 You have the right to refuse to be interviewed. If you consent to an
5 interview, you may have someone of your choice present. To assist in
6 obtaining every comment, exactly as it is given, and to expedite the
7 interview, your permission to tape record this interview is requested.
8 You have the right to refuse to have the interview tape recorded. As an
9 alternative, U.S. Nuclear Regulatory Commission investigators may prepare
10 a written record of your statements and request you to sign it. You
11 have the right to refuse to give a signed statement. In the absence of
12 a tape recording or a signed statement, the U.S. Nuclear Regulatory
13 Commission investigators will, to the best of their abilities, write
14 your comments for inclusion in the investigative report. Upon your
15 request you will be given a copy of your tape recording or signed statement.
16

17 You have the right to request that your identity be protected and not
18 used in the U.S. Nuclear Regulatory Commission investigation report.
19 However, because of the deep concern over this incident by the American
20 Public and government officials, the U.S. Nuclear Regulatory Commission
21 cannot assure you that we will not release your name and interview
22 contents if we receive official requests and requests by the public
23 through the Freedom of Information Act. If specifically requested, all
24 attempts will be made by the investigators to keep from disclosing to
25

1 Metropolitan Edison or other parties specific information. You must
2 recognize that this is not an absolute guarantee. Federal law prohibits
3 your employer from discharging you or discriminating against you because
4 of your interview with the U.S. Nuclear Regulatory Commission.
5

6 Your help and cooperation in providing information to the Nuclear Regula-
7 tory Commission will be appreciated.
8

9 SINCLAIR: At this time, before I turn it over to Mr. Martin, I'd like
10 to get a brief explanation or a background from you as to your affiliation
11 with the Nuclear Power Industry either as an Operator here with Met Ed
12 and maybe any academic training or military training that you have as
13 background, so if you could just give us a couple of minutes of that.
14

15 WRIGHT: Just briefly, I started with Met Ed eight years ago, almost to
16 the day of the accident, March 22, 1971 or 72. At that time I was a
17 Utility A Worker at Crawford Generating Station which was an approximately
18 130 megawatt coal fired plant. I worked there for a period of slightly
19 less than 2 years during which time I progressed to Auxiliary Bay Operator,
20 and I then interviewed to enter an Auxiliary Operator training program
21 at Three Mile Island. This was just prior to the commencement of Hot
22 Functional Testing in Unit 1. I spent 26 weeks in an Auxiliary Operator
23 training course and then onshift training and approximately 2 years as
24 an Auxiliary Operator in TMI Unit 1 and then went into a Unit 2 Control
25

1 Room Operator training program, went through the TMI training course, an
2 8 week B&W Simulator training course followed by mock NRC Orals and
3 Written and Casualty Drill. I returned to Three Mile Island where we
4 were in training for I'd say approximately 2 more years until our final
5 licensing exam by the NRC, and I've been operating in the Control Room
6 since that time.

7
8 SINCLAIR: Okay, thank you. At this time I'm turning the questioning
9 over to Mr. Tim Martin.

10
11 MARTIN: Mr. Wright, we are trying to establish a sequence of events of
12 the operations that occurred on March 28 from the time of the trip
13 approximately 4 o'clock until the reactor coolant pump in the A loop was
14 re-established that afternoon or evening around 8 o'clock. That's the
15 primary period of my interest. I would like to get from you the periods
16 of your involvement in the event and then I will focus in on the events
17 that occurred during those periods and attempt to better understand
18 them. So, if you can, would you start with approximately what time you
19 became involved and start into a scenario as you remember it. I have in
20 front of me and for the record a copy of the plant's strip chart, the
21 Reactor Coolant wide range chart for pressure, which will assist us in
22 sequencing through the event. So if you'll start, I'd appreciate it.

23
24
25

1 WRIGHT: Okay. I was called at my home in Middletown, which is about 2
2 miles from the plant by my Shift Foreman, Adam Miller. At that time I
3 was scheduled to report to work at 0700 for the normal 7-3 shift. The
4 time of the phone call was approximately 5:45. He called me, explained
5 that he was calling from his residence in, I believe it's Annville, Pa.,
6 that he had just been called by someone from Three Mile Island and
7 informed that there had been a reactor trip, turbine trip, I don't
8 recall fully, but I don't believe he mentioned anything about the fact,
9 or I don't even know if at the time he knew, there had been a ECCS
10 Actuation, Safety Injection, but he said that I was to report to the
11 plant as soon as possible. And I arrived here, I would say approximately
12 6:15. And at the time, I entered the Control Room, I came in by the
13 West door started around the Diesel Generator control panels, and the
14 turbine plant, and electrical system panels. I got as far as the Diamond
15 Control Panel and saw that there was what appeared to be a solid pressurizer
16 or a bum indication. At that point I didn't know which it was, and the
17 Shift Supervisor, Bill Zewe, was on duty at the time and told me, you
18 have the Secondary Plant, meaning the turbine generators, secondary
19 auxiliary systems, take a turn over from Craig Faust, shut it down; in
20 other words, what the normal response to a turbine reactor trip, securing
21 unnecessary secondary plant systems, making sure that everything is
22 going as it should. From that point forward, I would say at least
23 several hours, that was my major function, and most of what I know of
24 what was going on on the primary plant, was just from grabbing sight and
25

1 hearing of what was happening. I know that when I came in there may
2 have been, as I recall, maybe 2 or 3 RMS Channels in alarms. Now, we
3 have had trouble in the past with some of the Victoreen channels, usually
4 liquid monitors on systems that aren't even in service that have had
5 alarms on them for one reason or another. At that time, I could not,
6 with the time that I had to look at RMS, say that I saw anything that
7 was indicating, at 6:15 or whatever time it was that I got up there
8 somewhere, between that time and 6:30, that there was anything that
9 indicated to me that we were getting into a site emergency situation. I
10 was processing, trying to get information from the, one of the 11-7
11 CRO's, Craig Faust, regarding by what means he was feeding the generators.
12 I did know very shortly after my arrival just from observation and it
13 was explained to me that the "B" Steam Generator was bottled up because
14 they had indication that they had a tube leak in that generator. So,
15 one of my primary concerns became to make sure that, if nothing else, we
16 did not lift any, either the atmospheric reliefs on either main steam
17 line, or any main steam safeties. At that point, we were feeding with
18 the emergency feedwater pumps. I know that both main feedpumps were
19 tripped, and it was rather difficult, with the situation that these
20 fellows had on the panel, for the two of us to get together to try to
21 make any kind of a smooth turnover. I would say it was probably an hour
22 before it was fully turned over, as to that I had the turbine plant by
23 myself and knew everything that was going on, and running it. I would
24 say that it was somewhere around 6:45 to 7:00 o'clock in that area when
25

1 we started getting a lot more RMS alarms, started coming in. We had...at
2 that point, I believe it was my shift foreman, Adam Miller had arrived
3 by that time and was monitoring RMS, and I don't recall if it was he or
4 if it was some other Control Room operator, possibly some of the engineers
5 or supervisory people who were there, one who turned around to, I'm
6 pretty sure it was Jim, no it wasn't Jim Seelinger. It may have been
7 Gary Miller at that point said we have...that this person said, I believe,
8 we have a Site Emergency, that HPR 214 is exceeding 8R per hour.

9
10 MARTIN: What monitor is that ...?

11
12 WRIGHT: That's the Reactor Building Dome monitor. And I wish this had
13 been a month ago, I could have given you the names. But I can recall
14 that Bill Zewe is Shift Supervisor and who was in charge from the opera-
15 tions standpoint of that crew prior to the emergency. Mike Ross, Unit 1
16 Supervisor of Operations, and I believe George Kunder, Unit 1 Technical
17 Supervisor, Unit 2 Technical Superintendent, whatever, were there. I
18 don't recall just who declared the site emergency, all I remember is, it
19 was declared and immediately a couple of engineers, I believe one was
20 the Lead Electrical Engineer, Dick Bensei, immediately went back into
21 the Shift Supervisors' office, started making phone calls per our emergency
22 procedures.

23
24
25

681 111

1 MARTIN: Mr. Wright, the thing which appeared to key the site emergency
2 was the reactor building dome monitor?
3

4 WRIGHT: That appeared to me to be the thing, again my attention was
5 focused more on the secondary plant. That was the thing that I heard
6 that drew my attention to, hey, we have a real problem here. That is
7 when I became aware of the severity of the situation, that, you know, we
8 had activity anywhere to the extent that we had a site emergency on our
9 hands.
10

11 MARTIN: All right. Would you continue in the scenario?
12

13 WRIGHT: Okay. It's rather difficult going into the scenario, but just
14 two key things during that day, I guess, that stick in my mind more than
15 anything else because I was directly involved in them. One was the fact
16 that as were reducing in our main steam pressure, so forth, and had gone
17 onto auxiliary steam to feed our turbine gland sealing steam so that we
18 could maintain vacuum in the condenser, which we needed to use our
19 turbine bypass valves to remove heat from the "A" Steam Generator. At,
20 when we came to a point where we just did not have sufficient steam, we
21 saw it blip downward in condenser vacuum, upward on the chart, at that
22 point it's in trying to hold on, I had the gland steam control valve
23 bypass full open so that we could get maximum steam flow through the
24 seals and noticed that we lost, I would say, in the neighborhood of a
25

1 half-inch vacuum. It was very quick, I didn't know when it was going to
2 stop, and drew this to the attention of several very busy people, Mike
3 Ross and Bill Zewe...drawing their attention to it and trying to go
4 ahead and get communications with Unit 1, which...their people control
5 our auxiliary boilers, which we needed to supply steam at this point...in-
6 forming them of this matter and being informed that the situation was in
7 hand...Unit 1 had people tending the auxiliary boilers. I tried to open
8 the...have an auxiliary operator open...the manual bypass around our
9 Unit 1, Unit 2 Aux Steam Isolation Valve, which is the motor-driven
10 valve in the Control Room, ASP-23. Rather than opening that, because I
11 was aware that they had only 1 Aux Boiler in service, and we were doing
12 feedwater heating on Unit 1 preparatory to their startup following a
13 refueling, I had an Aux Operator go down and start to cut in ASB-209,
14 which is the manual bypass valve around the motor driven, so that we
15 would take the minimum amount of steam required, take very little steam
16 for the seal of the turbine, which was my only consideration at that
17 point. But we did have some trouble communicating with Unit 1, and I
18 got to say I don't know if the people over there realized the severity
19 of the situation that we were in at the time, because it seemed to be
20 taking an undue amount of plugging of them and getting in touch with
21 them before they finally committed that, you know, let's use Priority 1
22 to get us the auxiliary steam. What happened with the auxiliary boilers,
23
24
25

1 whether they got a dirty fire eye, whether they lost drum level, I don't
2 know, but for some reason the one auxiliary boiler that had been handling
3 the load went off while they were trying to get the second boiler in
4 service. And at that point we lost gland steam again. We had had just
5 some very slight positive pressure, enough to the hold seals. And I was
6 informed of this by phone by one of the Unit 1 Operators. I can't remember
7 for sure who it was, but at that point I asked Mike Ross and Bill Zewe
8 what they wanted me to do with this. My recommendation was: let's take
9 our chances with the seals, turbine seals aren't very important items at
10 a time like this, let's try to maintain our condenser vacuum. We started
11 to lose a little vacuum again and finally the decision was made. I
12 believe it was Mike Ross that ordered me to do it, was to go ahead shut
13 down our vacuum pumps, break condenser vacuums. And at that time, I
14 would say that time would be somewhere in the neighborhood of 8:30-9
15 that we stopped vacuum pumps and opened the vacuum breakers on the main
16 condenser, and of course at that point, approximately 18 inches of
17 vacuum, we go on our atmospheric dumps for steam pressure control, which
18 by a virtue of the main, goes to the atmosphere. And at that time, we
19 did not know how severely crapped up our feedwater might be, but we
20 certainly had to assume after having for some small period of time, I
21 don't know without going back in the log and looking just how long it
22 was, the time the leak was detected from "B" Steam Generator until it
23 could be isolated, but I was sure that we had some activity in our
24 feedwater.
25

1 MARTIN: Mr. Wright, at this time you were feeding with the emergency
2 feedpumps?

3
4 WRIGHT: That's right.

5
6 MARTIN: To the "A" Steam Generator? What was the source of their
7 suction?

8
9 WRIGHT: The source of their suction? The source of their suction would
10 have been to the best of my knowledge the condensate tanks.

11
12 MARTIN: Thank you, Mr. Wright. You can continue.

13
14 WRIGHT: At this point, I lose all track of time frame. There's only
15 other major event that sticks out in my mind as far as time, which would
16 be at 1400, when we had I would say no less than our second or third
17 containment isolation signal, and our building spray pump started, which
18 we have since been told has been figured out to have been caused by a
19 hydrogen explosion in the building. At that time, I know it was an
20 instantaneous spike up to roughly 29 pounds on our reactor building
21 pressure recorders. But people were zeroed in on the pressurizer,
22 trying to get some type of bubble and at this point I'm not sure whether
23 this was when we were trying to reduce pressures and try to get on decay
24 heat removal, which is one thing we did. Whether it fell into this time
25

1 frame or not, but I know we were trying to jog our electromatic relief
2 isolation valve hoping to draw a bubble, and again some control over
3 pressurizer level and pressure. But when this occurred, I was again on
4 the secondary plant and I'm sure that by this time, we were feeding with
5 our condensate pumps to our normal startup feedwater valves. Once we
6 ge down to approximately 120 pounds pressure, anything less than 150,
7 we can feed our steam generators just off of our condensate pumps.

8
9 MARTIN: Mr. Wright, do you have any idea approximately what time you
10 shifted from the emergency feed to the condensate pump for feeding Steam
11 Generator? Can you tie it in with an event which might of occurred at
12 approximately the same time?

13
14 WRIGHT: I can't, I can't recall anything that sticks out in my mind on
15 that.

16
17 MARTIN: Can you tie to a reason for shifting from the emergency feed to
18 condensate?

19
20 WRIGHT: The only reason I can tie in was the difference in hot-well
21 temperature by coming right off, straight off, storage tank. The fact
22 that the condensate pumps could handle the load at that point, it was a
23 normal shutdown situation. We were maintaining our 50% or greater
24 level, I know. At one point we had increased level greater than 50% in
25

1 the generator. I said I'm just sorry this interview is so darn far down
2 the road, so I can't remember some of the sequences of events. I'm sure
3 your computer printout shows a lot of this. But as far as anything in
4 particular, I would just say steam generator pressure, due to cooldown
5 and so forth, got low enough that we were less than 150 pounds. I would
6 say we were in the neighborhood of 100 pounds on the steam header pressure
7 in the "A" Generator at the time that we shifted to the condensate
8 pumps.

9
10 MARTIN: Fine, Mr. Wright. To help bracket the time that you were
11 involved in the event, what time did you leave the site during this
12 event?

13
14 WRIGHT: I left here approximately 1930.

15
16 MARTIN: All right Mr. Wright. I'd like to take you through the scenario
17 as we understand it, and attempt to pick up some information of possible
18 things that you saw, hopefully to jog your memory. At approximately 6:15
19 in the morning, 6:20, somewhere in that area, the block valve on the
20 electromatic relief was shut, do you remember that? Did that event
21 register?

22
23 WRIGHT: No. I can't say it did. I know now from hearing everyone talk
24 when we tried to put things together that it was shut at that time. I
25

1 would have guessed that it had been shut earlier. I would say it was
2 shut, evidently, just prior to my arrival.
3

4 MARTIN: All right. When you did arrive in Unit 2 Control Room, what
5 impression did you have of things that were going on at the Makeup Panel
6 as you entered the Control Room, and why you were assuming it?
7

8 WRIGHT: My initial impression was, just from looking at all the alarm
9 panels and so forth, it was pretty obvious that safety injection had
10 occurred. Like I said, the thing that stopped me short when I got to
11 the Diamond Panel, about that far over, on my way to look and see what
12 the situation was at the Makeup Panel, was pressurizer level being
13 out-of-sight high. At that point, I had no idea whether that was a true
14 indication, whether level had been, level indication, had failed high,
15 or what the situation was. I wish I could recall pressure, just what
16 the pressure was at the time. But the ...
17

18 MARTIN: All right Mr. Wright. Sometime after this and while you were
19 assuming your watch on the condensate system on the secondary system, we
20 had a start of a reactor coolant pump. Do you remember any problems
21 that they had in starting that pump?
22

23 WRIGHT: Here again, it was mostly hearing what was going on but I
24 would, as I recall, there was a problem on the pump. It seems to me
25

1 they tried to start more than one pump. There was a problem with
2 several...at least one would not start...and if I'm not mistaken, one
3 gave no start indication but the oil pumps went off and it gave, as far
4 as amps, it gave indication of running. That pump, as I recall, was
5 shut down because of vibration, and also this totally illogical situation
6 of non-running indications as far as light indications, so forth, yet
7 oil pumps which knock off when you get a full speed signal on the pump,
8 going off and having amps showing on the pump running amps.

9
10 MARTIN: Do you remember the approximate amperage that was observed?

11
12 WRIGHT: No. I would not have been able to see that from my vantage
13 point.

14
15 MARTIN: How does this event tie in with the declaration of a site
16 emergency? Was this before or after?

17
18 WRIGHT: I really can't honestly answer that.

19
20 MARTIN: All right. The reactor coolant pump was in actuality run for
21 about 19 minutes. It was finally tripped, we don't whether it was by
22 operator actions or by something else. Do you have any insights in this
23 area?

1 WRIGHT: No, I really don't.

2
3 MARTIN: Once the pump was tripped off the line, what operator action
4 was taken relative to the Makeup Panel? Did you observe anything over
5 there?
6

7 WRIGHT: I can remember at least one time, having high pressure injection
8 re-initiated. At this time, I believe the people in the Shift Supervisor's
9 office and were on the phone on some type of communications with the
10 NRC, and with Babcock and Wilcox. And the order came out, get high
11 pressure injection, and I would say it was probably coincident with this
12 inability, or whatever was tripping or operator actions as far as reactor
13 coolant pump.
14

15 MARTIN: Now, during this period the "B" Steam Generator is isolated and
16 we are steaming the "A" Steam Generator, heating with the emergency
17 feed, and what level was being maintained?
18

19 WRIGHT: As I can recall we were approximately 50% on the operating
20 range in the generators at the time. I know that . . .
21

22 MARTIN: Does that level correspond to some procedural limit?
23
24
25

1 WRIGHT: Okay. A 50% limit would be to induce natural circulation on
2 loss of the reactor coolant pumps.
3

4 MARTIN: All right. For the next several hours, were you still attempting
5 to maintain 50% level?
6

7 WRIGHT: You know that one day runs to another, and we were doing various
8 things, but I would say the day of the emergency also that, that at
9 least on one occasion, we took level higher than 50% range. We took
10 that, and we know we kept logs of the steam generator levels in the last
11 month. But I don't know why the numbers, they could be all wrong. I'm
12 sure you can tell me better than I could tell you. I'd say we probably
13 had it up to 380 inches or so, at least at one point.
14

15 MARTIN: All right Mr. Wright. Approximately at this time, Mr. Miller
16 came in, Mr. Rogers came in, several other people arrived on site. Was
17 there ever another attempt to start the reactor coolant pumps?
18

19 WRIGHT: It runs in my mind here, there's more than one attempt. But
20 there again, I don't know if I'm associating the multiple attempts that
21 we talked about previously or whether it was the second attempt later in
22 the day.
23
24
25

1 MARTIN: All right, Mr. Wright. Let's proceed further, pressure was
2 slowly dying off on the primary system during this period, and who was
3 operating the makeup system at this time, do you have any idea?
4

5 WRIGHT: The people I remember being over at the makeup system operating
6 it, Ed Fredericks and the foreman, Fred Scheimann, was at one point, in
7 fact for quite a while, you could see it on the charts, they were cycling
8 the electromatic relief block valve, trying to hopefully establish some
9 kind of a bubble. I do recall that, and I would say that most of the
10 manipulations, if not all of them as far as makeup pumps, as far as
11 initiating or securing high pressure injection, was done by Ed Fredericks.
12

13 SINCLAIR: The time is 4:30 PM and we're gonna break for just a moment
14 to change the tape.
15

16 SINCLAIR: The time is 4:31 PM. We are continuing the interview with
17 Mr. Wright.
18

19 MARTIN: All right, Mr. Wright, sometime after 9 o'clock in the morning,
20 a decision was made to increase the pressure in the primary system and
21 to control pressure in a band between 2200 and 2000 pounds, cycling some
22 valve on the pressurizer, are you knowledgeable of what valve was chosen
23 for this duty?
24
25

1 WRIGHT: At the time I would have said it would have been the electromatic
2 relief valve. But here again, this is with hindsight and knowing that
3 there had been indication all too late, I guess, that the electromatic
4 was not receding when it should, that I would say now that the controlling
5 pressure had to be doing it on the block valve.
6

7 MARTIN: Approximately 7 hours into the event, around 11:00 o'clock,
8 another decision was made to increase the range of pressures that would
9 be allowed to be controlled in. Do you have any knowledge of the basis
10 for that decision?
11

12 WRIGHT: No, I don't.
13

14 MARTIN: All right. At approximately 11:35, something like that, we saw
15 that the pressure in the primary systems starts to tail off very rapidly,
16 heading for a low of around 400 pounds. Do you have any knowledge of
17 why this occurred?
18

19 WRIGHT: Now you are saying as far as time, you say around 11:00 o'clock.
20

21 MARTIN: It was 11:35, approximately.
22

23 WRIGHT: It seems a little early for me, but that was an awfully long
24 day.
25

1 MARTIN: I understand.

2
3 WRIGHT: But I would say that that was the point at which a decision was
4 made, let's try it and get this pressure down, try to get on the decay
5 heat removal, so that we can run into decay heat removal pump and know
6 we have flow, have cooling of the system. Because I remember there were
7 two different operators, myself and later another CRO on my shift, Mark
8 Coleman, who went down to the shutdown from outside the Control Room
9 panel to watch reactor coolant system pressure. We were trying to head
10 it down below 320 pounds so that we can go on the decay heat removal.
11 The lowest I saw on that indication down there, which is a digital
12 readout, was 385 pounds. And it held there for awhile and moved up to
13 387 and then started back up. Now, we were down below and I don't know
14 if a decision was consciously made at that point this won't work, or
15 whether other things happened.

16
17 MARTIN: All right, Mr. Wright. During this transient down from around
18 2000 pounds to 500 pounds, was...you were I believe at that time on the
19 atmospheric dumps?

20
21 WRIGHT: Yes, I'm sure we were at that time.

22
23 MARTIN: Somewhere probably between this period of time, you were directed
24 to secure those dumps. Do you remember that? And if so, do you remember
25 the basis for it?

1 WRIGHT: I'm sure of the basis of that, I know what a good sound reasoning
2 is, like limit the amount of possibly, and in fact at that point I would
3 say we were fairly sure we had some activity in the steam that we were
4 releasing to the atmosphere through those dumps.
5

6 MARTIN: Is that based upon samples from the steam generators?
7

8 WRIGHT: I can't really honestly answer that because at that point I
9 don't even know if we had people that were onsite that would have been
10 taking samples of steam generators. It seemed to me that we had people
11 in the Control Room and out on emergency parties and that was about all
12 we had. What was going on in the Chem Lab's, I don't know.
13

14 MARTIN: When you did secure the atmospheric steam dumps? How soon
15 before you were able to re-establish steaming to the condenser?
16

17 WRIGHT: I'd have to look at a chart.
18

19 MARTIN: Do you have a gut feeling?
20

21 WRIGHT: I couldn't begin to tell you what time. I remember putting the
22 condenser back under vacuums and establishing seals and going under
23 vacuum, but as how the time factor relates from when we secured the
24 steaming of the atmospheric dumps 'til we went back to the condenser
25 to the bypass valves, I couldn't even give you a good guess on that.

1 MARTIN: All right, Mr. Wright. I'll jump back a little bit in time.
2 I'm not sure of the exact time for this but when you shifted from the
3 condenser to the atmospheric steam dumps was there an operation that we
4 had to do with the condenser circ water pumps to satisfy interlocks.
5

6 WRIGHT: There's one thing that we must do that is quicker than waiting
7 for your vacuum on your main condenser, which is to go down the left of
8 three circ water pumps, which will automatically change the control from
9 the turbine bypass valves to the atmospheric dump valve.
10

11 MARTIN: Was this the mechanism we used to shift over to the atmospheric
12 dumps to prevent this...losing them all (?...on condenser vacuum?
13

14 WRIGHT: Anymore, I don't remember for sure, but it would definitely
15 have been the quickest way.
16

17 MARTIN: So, we don't know if you did that operation, but that was one
18 of the ways?
19

20 WRIGHT: It's amazing what you can't remember. I would say that we would
21 have to, though, because we've been through a problem before where we
22 did lose vacuum, and set a record for lifting a low pressure turbine
23 rupture disc because we tried to wait for the last possible moment
24 before going on the atmospheric dumps. Actually, the thing that had
25

1 gotten us that time was still steaming feed pumps to a condenser on
2 which the vacuum had been totally lost. I'd say with just that reaction,
3 you know, past practice you might say, we most likely did go to the circ
4 water pumps as the quickest means to avoid overpressurizing the main
5 condenser.

6
7 MARTIN: All right Mr. Wright. Let's continue at approximately noon we
8 were at 1,000 pounds and dropping, by 1:00 o'clock we were around 500
9 pounds, and we probably see some first indications of something about
10 core flood tanks. Could you give me any idea of what might of happened?
11

12 WRIGHT: Yeh, there was one idea being kicked around, of let's get
13 pressure down. Core flood tanks we maintained within tech specs 585 to
14 625, so we were somewhere, I'd say, about 600 pounds on core flood tank
15 pressure. To get down below that, let core flood go in, of course since
16 it wasn't controlled drop, in other words, not going to zero, not your
17 design basis LOCA or anything, they tended to, what's the terminology
18 used I don't know, but they emptied at a rather slow rate. It wasn't
19 the instantaneous discharge from the nitrogen overpressure that you
20 would expect on what they were really designed for...trying to get that
21 borated and cooler water right into the core.
22
23
24
25

1 MARTIN: Did you observe that decrease in core flood tank level?

2
3 WRIGHT: I can't say that I stood there and decreased it at the time.
4 There again, with the conversation that was going on, and I'm aware that
5 there was a decrease, that there were several people back watching the
6 core flood tanks and at a later time when I got around that panel, yes
7 they were down. I would say somewhere in the neighborhood of around 8 -
8 8 1/2 feet, I believe.
9

10 MARTIN: During the following hour, and I guess your time is probably
11 lost to you, but did you hear anything during that morning or afternoon
12 while we sat at this low pressure? Anything peculiar?
13

14 WRIGHT: You mean like on the sound monitoring channels?
15

16 MARTIN: Sound monitoring channels by the ...
17

18 WRIGHT: Equipment ...
19

20 MARTIN: Any equipment or abnormal noises?
21

22 WRIGHT: I think I know what you're referring to around 1400, and I
23 heard that some people heard this. I didn't. Talk about something
24 coming over related...I've heard it described as a pop...or anything
25

1 that I guess was to have indicated that possibly we did have a hydrogen
2 explosion...I didn't hear it, but other people who were up there I know,
3 including Gary Miller, heard something.
4

5 MARTIN: What was the status of your steam generators at this point?
6

7 WRIGHT: The status of the steam generators. At this point? Well, I
8 know the "B" was bottled up, that's about all I would say. At this point
9 we better have been on feeding with condensate on the "A" generator. We
10 changed so many directions for certain things at various times that I am
11 trying to remember if and, if so, how many times we may have even gone
12 back to emergency feed. I don't really recall.
13

14 MARTIN: Let's continue. At any time during that afternoon, do you
15 remember Mr. Miller having to leave, Mr. Miller and Mr. Kunder having to
16 leave Unit 2 Control Room, and do you know for what purpose?
17

18 WRIGHT: The one time that I remember, I remember hearing...whether it
19 was a phone call directly from Jack Herbein on radio or what it was...I
20 know at one time Gary Miller had to leave. I was not aware of George
21 Kunder being called. Something of the idea of having to go either to
22 the Observation Center to meet with the Governor, or go up to the Governor's
23 Office, sometime during that afternoon, which was kind of a surprise to
24 me.
25

1 MARTIN: You were unaware of their having left, though?

2
3 WRIGHT: I'm aware that from time to time they were not...you know,
4 George I don't know, Gary had to leave at one point.

5
6 MARTIN: Do you have any feel for how long Mr. Miller was gone?

7
8 WRIGHT: No.

9
10 MARTIN: Who were you receiving your directions and orders from?

11
12 WRIGHT: Well, I was receiving them from Bill Zewe, from Mike Ross and
13 of course, we had other people coming in. I actually worked over, what
14 you might say, three different crews that day, the off going 11-7 crew;
15 my own crew, which was Greg Hitz, Shift Supervisor; and the crew that
16 relieved us, I believe it was Joe Chwastyk who was the Shift Supervisor.

17
18 MARTIN: All right Mr. Wright. During this afternoon up to around 4:00
19 o'clock, you were attempting to establish natural circulation in the
20 loops. Are you familiar with the operation that they were attempting,
21 to get this going?

22
23 WRIGHT: As far as establishing natural circulation I tell you the truth
24 it seemed to me like we changed again. I'll say we changed directions.
25

1 It seemed that somebody was on the phone. When someone suggested, this
2 we tried it, such as I mentioned, that we had high pressure injection.
3 At least once...I would say I come in twice...as we went to high pressure
4 during the day. I'd say probably somewhere between when I first
5 arrived...and it always seemed to come out of the Shift Supervisor's
6 office, meaning whoever the people were who were talking with Parsippany,
7 King of Prussia, Lynchburg and whoever. I don't rank high enough in the
8 hierarchy to know who was giving whom advice.
9

10 MARTIN: I understand.
11

12 WRIGHT: I know going back on the bit when we broke vacuum on the turbine,
13 it did not seem like the proper thing to do to me, but when you're in an
14 emergency situation like that, the last thing in the world you want is
15 for everybody to be going their own way. Somebody has to give directions.
16 Sometimes there's a lot of different ways of doing things, and there can
17 be some ways better than others. But just because it's not your way,
18 it's not always wrong. There were men like Mike Ross who were more less
19 standing back. It was their responsibility to have the big picture. It
20 was ours to manipulate the controls and operate the panels. That's the
21 way I felt about that, and as far as a lot of other things, I can defin-
22 itely say it wasn't a normal day. It wasn't something where everybody
23 there knew what everyone else was doing.
24
25

1 MARTIN: At some point of this afternoon, who decided to repressurize
2 the primary system, leave the core flood tanks behind and to attempt to
3 collapse the bubble in the reactor coolant system? Do you have a feel
4 for when that decision was made, and how it was executed?
5

6 WRIGHT: Everything is going together to me. For the most part, the
7 first time that I really got on the primary plant was the following day,
8 when we actually did have a few inches of indicated pressure...a few
9 inches from being offscale on the pressurizer level.
10

11 MARTIN: All right, Mr. Wright.
12

13 WRIGHT: I'd say this was the point when pressure was brought back up to
14 try to collapse the bubble, and it was kind of tough to collapse the
15 bubble at a low point in your system, running at a reduced pressure.
16

17 MARTIN: All right, so at this point the primary system pressure was
18 increased to approximately 2300 pounds, and then we see a distinct
19 flattening-off of the pressure. Do you have any idea how they maintained
20 pressure control at this point?
21

22 WRIGHT: Well, if it's a whole bunch of squiggly lines like it was ...
23
24
25

1 MARTIN: It's not, it's flat.

2
3 WRIGHT: It's flat. How pressure was controlled? I can't help you
4 there. Like I said, the thing I remember is the cycling of the electro-
5 matic block valve.

6
7 MARTIN: All right. Just before you got relieved of watch, in fact
8 let's see, you got relieved about 1930?

9
10 WRIGHT: That's what time I got out of here, I anymore I don't know.

11
12 MARTIN: Were they attempting to start a reactor coolant pump as you
13 were getting relieved?

14
15 WRIGHT: Plans were being made to start one.

16
17 MARTIN: Do you have any idea of what kind of problems they were exper-
18 iencing?

19
20 WRIGHT: No, I can't say that off hand I do, other than that all I
21 remember is, again, the conversation regarding, you know, with the
22 pressure we were carrying. At this point people were becoming aware
23 that we had some bubbles in the system, or at least a bubble somewhere.
24 And the idea was, what happened if that goes into reactor coolant pumps.

1 As far as if you are referring to any, in other words, attempts to
2 start, attempts on the pumps that were unsuccessful, at that point I
3 don't recall.

4
5 MARTIN: Do you remember any discussion of problems with the lift pumps,
6 or back stop oil pumps?

7
8 WRIGHT: Only that I've mentioned earlier, about the incongruous indica-
9 tion; but there again I can't say that I witnessed...,you know.

10
11 MARTIN: All right, Mr. Wright. Let's leave the event for a moment, and
12 I'm looking for some background information. One of the hypotheses for
13 causing the initial trip was that we had a problem with the polisher
14 isolation valve system. Part of that hypothesis revolves around intro-
15 ducing water into the control lines for the air-operated isolation
16 valves. To your knowledge had that ever occurred?

17
18 WRIGHT: Yes. It has never occurred when I have been on duty, but I'm
19 aware that we have had problems before with that system, as far as air.

20
21 MARTIN: With water getting into the system and causing the controllers
22 to malfunction?

1 WRIGHT: Yes. As a matter of fact, at one point...this was back during
2 hot functionals...we even had resins from the polishers back through
3 demin water lines, and as I recall we even got them into, well, anything
4 that had a surge tank on it that was filled by demin water. We did have
5 our share of problems in polishing.

6
7 MARTIN: Could you describe or help me understand how this is possible?
8

9 WRIGHT: No.
10

11 MARTIN: Can you identify someone who might be able to help me?
12

13 WRIGHT: I would say any of your Auxiliary Operators who work the conden-
14 sate polishing panel.
15

16 MARTIN: Is there any specific engineer who works with this particular
17 system and could be very knowledgeable in its operation in malfunctions?
18

19 WRIGHT: We have two. Don Berry and, well, Walter Bubba Marshall.
20

21 MARTIN: All right Mr. Wright, I've exhausted my normal questions. I
22 guess I'm gonna ask for your assistance here. Is there any aspect of
23 this event that I haven't asked you a question about, which you have
24 knowledge of, and might assist me in analysis of this event. And if so,
25 would you please relate it to me.

1 WRIGHT: No. The only thing I could have given you was a day or two
2 after the event, when people were still arguing as to whether or not the
3 building spray pumps had started and how long they run, because I shut
4 them down and I know that they ran for a long-enough period of time to
5 spray, but I think you already established all that.

6
7 MARTIN: How long did they run?

8
9 WRIGHT: My best estimate...I'd say 5 or 6 minutes.

10
11 MARTIN: Do you have any other areas that you might be able to expand
12 on?

13
14 WRIGHT: Not off the top of my head.

15
16 MARTIN: All right, Mr. Wright.

17
18 WRIGHT: I didn't have any prepared notes.

19
20 MARTIN: At this time we usually ask if the interviewee has any comments
21 that he'd like to put on the record. I'll open it up to you right now
22 if you desire to do so.
23
24
25

1 WRIGHT: I don't have any more comments.
2

3 MARTIN: Mr. Wright, I appreciate it and I'm going to turn this back
4 over to Mr. Sinclair. It's all yours, John.
5

6 SINCLAIR: Thank you Mr. Wright. The time is presently 4:54 PM. We are
7 going to conclude this interview with Mr. Wright.
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25