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OFFICIAL TRANSCRIPT OF PROCEEDINGS

Agency: Nuclear Regulatory Commission
Incident Investigation Team

Title: Nine Mile Point Nuclear Power Plant
Interview of: MIKE CONWAY

Docket No.

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PAGES: 1 - 77

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Exhibit 3-1 (continued)

ADDENDUM TO INTERVIEW OF MICHAEL S. CONWAY STAT. SHIFT SUPV.
(Name/Position)

Page	Line	Correction and Reason for Correction
6	11	EPR TO APRM : TERMINOLOGY CORRECTION
7	6	EPRM TO APRM : " "
10	21	STRIKE/REMOVE THE "I" : NOT RELEVANT & MAKES NO SENSE
12	1	CHANGE FLAT TO BLACK IE: NO POWER AVAIL/INDICATES
15	8	ADD 'IN' FOLLOWING FILTER : TO MAKE MORE SENSE
16	3	RCI TO RCIC : CORRECT TERMINOLOGY
16	13	RCI TO RCIC AND THAT IS "WAS" RUNNING, NOT "WASN'T"
17	2	CHANGE LB-10's TO LV-10S : TO CORRECT TERMINOLOGY
18	9	202.3 FROM 2023 : WHICH IS ISSUE 8
20	7	SHIELD TO SEAL : CORRECT TERMINOLOGY
20	21	MGANS TO MAINTENANCE : CONTEXT REFERENCE
21	19	RAB TO ROD : CORRECT TERMINOLOGY
22	11	PURSING TO PURSUING : TYPO
23	6	QUOTE : UNCERTAIN WHY THIS IS IN THAT LINE
24	13	ARCH OR TO RHR : CORRECT TERMINOLOGY
26	8	INC TO I&C : CORRECT TERMINOLOGY
26	12	INC TO I&C : " " "
26	17	RAB WASH TO ROD WORTH : CORRECT TERMINOLOGY
27	15	RAB TO ROD : CORRECT TERMINOLOGY
28	14	RPB TO RPV & OP TO EOP : TERMINOLOGY CORRECTION
28	15	WOIGHT TO WAIT : PROP. TERMINOLOGY
31	8	RNC TO I&C : PROP. TERMINOLOGY
31	17	RFS TO RPS : " "
32	6	RFS TO RPS : " "
33	1	PLANNED TO POINTED : CONTEXT REFERENCE
36	14	S ET AL TO S @ ALL : PROPER TERMINOLOGY
36	19	AT COOL TO COOL : " " "
44	25	PRINTING TO PRINT : CONTEXT REFERENCE
45	17	FINS TO FANS : CONTEXT REFERENCE
46	7	EPRMS TO APRMS : PROPER TERMINOLOGY
46	23	" " " "
52	2	AND I HAD TO AND ARI HAS COME IN : CONTEXT REFERENCE

Page 1 of 2 Signature [signature] Date 10/2/91

ERRATA SHEET

ADDENDUM

Page	Line	Correction and Reason for Correction
55	15	MAB TO MANNAR : CONTEXT REFERENCE
59	15	MODERATING TO MONITORING : CONTEXT REFERENCE
59	16	NON-LOP TO NON-LOT : CORRECT TERMINOLOGY
61	2	HILLIKER TO HOLKER : CORRECT NAME
63	19	ADD "POWERS FROM" : ADD CLARIFY CONTEXT REFERENCE
73	8	MIGHT TO RISK : CONTEXT REFERENCE
74	21	ALL RODS IN TO ALL RODS NOT IN : CORRECT PROCEDURE REFER
75	1	DOWN TO DOWN : CONTEXT
75	8	RPB TO RPV : PROPER TERMINOLOGY

Date 10-7-91 Signature

BS 2 of 2

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

INCIDENT INVESTIGATION TEAM

- -

Interview of :

MIKE CONWAY :

(Closed) :

- -

Conference Room B
Administration Building
Nine Mile Point Nuclear
Power Plant, Unit Two
Lake Road
Scriba, New York 13093
Saturday, August 17, 1991

The interview commenced, pursuant to notice, at 12:12 p.m.

PRESENT FOR THE IIT:

John Kauffman, NRC

Mike Jordan, NRC

PROCEEDINGS

[12:12 p.m.]

MR. KAUFFMAN: Today's date is August 17, 1991. We're in the P building at Niagara Mohawk power unit number 2. My name is John Kauffman. I'll be leading the interview. I'm with NRC/AEOD.

MR. JORDAN: I'm Mike Jordan. I'm with the NRC, out of Region III. I'm a section chief.

MR. CONWAY: And I'm Mike Conway. I work for Niagara Mohawk. I'm a station shift supervisor.

MR. KAUFFMAN: Great. Now that we have the preliminaries out of the way, I'd just like to have Mike start off and tell us a little bit about his previous work history, background, education, number of years on the job, et cetera.

MR. CONWAY: Okay. Prior to working for Niagara Mohawk, I graduated from high school; I never went to college; I joined the Navy and became a Navy nuke. I spent six years in there, aboard submarines out of Charleston, South Carolina. Then I got hired by Niagara Mohawk.

When I first came to work here, I got hired as an auxiliary operator at Unit One. I was sent to license class and received a hot license, reactor operator, at Unit One, at which time there were several of us that did that, and then we were sent to Unit Two, which was in the construction

phase.

MR. KAUFFMAN: What year was it you were hired on as an aux operator?

MR. CONWAY: November, 1982.

MR. KAUFFMAN: When did you get your license?

MR. CONWAY: The first license -- I want to say that was February -- around that time -- early '84.

MR. KAUFFMAN: And then you stood shift --

MR. CONWAY: I didn't have any operating time. Basically, I believe, the company's philosophy at that time was to obtain a hot license on Unit One and then start learning Unit Two, which was in construction, because we had to obtain cold licenses, and they felt that that would give us a good basis and background for a cold license on Unit Two. It worked pretty well. I successfully passed a Unit Two cold license reactor operator exam.

MR. KAUFFMAN: When was that? Do you know? A long time ago?

MR. CONWAY: I don't remember the specific dates here, or time. That's on record someplace. I'm sure you can obtain that information.

I spent at least five years as a reactor operator at Unit Two, control room operator, plant operator. The way we work our shift program is, we rotate in plant and in control room for responsibilities.

Then, a year and a half ago, I was sent to senior reactor operator class, and last August I passed the exam. Prior to that, I was in the union. Once they send you to class and you get your SRO, they offer you a management position, and I was offered a station shift supervisor job and accepted and started December 1 of last year.

MR. KAUFFMAN: In the Navy, you were --

MR. CONWAY: Machinist's mate.

MR. KAUFFMAN: I'm just trying to establish background.

I guess the next thing we'd like to talk about is the August 13 event that you were station shift supervisor for, the plant conditions prior to the event and then what you saw and what you did.

MR. CONWAY: Okay. We were just finishing up a midnight shift. It was approximately 10 of 6 in the morning, and we had 100 percent power, preparing our shift turnovers. The work was done for that shift.

MR. KAUFFMAN: Can I interrupt?

MR. CONWAY: Sure.

MR. KAUFFMAN: One thing I haven't heard from anybody is the power history, how long the plant had been up and operating before this.

MR. CONWAY: It's funny you should say that, and it's one of those things we knock on wood when we say; we

kind of keep track of how long we've been on the grid and stuff like that. It had been about 121 days we had been operating, and of course, I knocked on wood after I said, Yes, 121st day, on the shift brief and stuff like that.

We were doing our turnovers, and I think Mike Eron, my assistant, was reviewing the shift checks. Most of the plant operators were getting ready for their turnovers. I was at my desk in the control room, and we heard a pop, kind of a popping sound. When I looked up from preparing my turnover, I noticed all the annunciators in the control room were out. They were not lit, any of the ones that were previously lit.

An eerie silence type thing. Normally you hear typers printing or the hum of fans blowing, power supplies, that type of thing. Everything went quiet. Of course, I ran out of the office and asked what happened, what's going on. It looked to me like some sort of a power failure. It was very hard to tell immediately. Obviously, when you lose all the annunciators, that's related to a power supply problem.

We immediately checked what power level and pressure were on the 603 panel, and the records had all stopped, and indicators had failed either up-scale or down-scale, some of them as-is.

One of the odd things about it was that the

instrumentation seemed to be not functioning, and the alarms didn't function at all, and all the computer CRTs went black, but we still had indications for all motors, the red-green lights, for valve positions, red-green lights -- we still had all those type of indications still available. Over on the electric plant boards, we still had a meter indication available for all power, for all our electric supplies to the different switch gears and stuff.

When I got the report that, we can't tell what power is because chart recorders had stopped, I yelled out, Somebody check the EPR meters in the back. I believe it was Mike Eron that went to the back, he and another operator -- I'm not sure which one; I want to say Dave Hanczyk, but I'm not sure.

While they went to the back, I immediately walked over to the 601 panel and looked at the PAM recorders, post-accident monitoring, and noted that they had tripped to fast speed. They normally run on slow but trip to fast speed when certain initiating conditions occur -- high reactor pressure or low water level in the vessel. They were running. Pressure was about 940, and vessel level was getting about 175, 180, in that range, and they were running at fast speed. It looked like a flat-line trace.

While I was there, I turned and looked at the 603 panel. I noticed that the recirc pumps had down-shifted to

low speed and that, on what we call the Rubik's Cubes, or the redundant reactivity control system, on 603, we had an indication of an ARI, alternate rod insertion, and a down-shift of the pumps.

At that time, I think, Mike Eron came up from the back panels and said the EPRMs are reading down-scale. He said, I recommend we place the mode switch to a shutdown. I said, I agree; some event's going on. I directed the CSO to place the mode switch in shutdown.

At that time, people started performing their immediate actions for the prior procedures for a scram. During that time, I was also receiving reports. Somebody said, It looks like the feed pump has just tripped. At that time, I believe, I assigned one of the non-licensed operators, Eric Hoffman, to watch level and pressure on the 601 panel and keep me informed of the status, if you see any changes in the trends.

Then I turned around to our EOPs laying on top of the computer CRT in front of the 601 panel. I turned around to that, and I asked power, level and pressure. They gave me the readings, and I'd jot them down on the boards there, just as a formality, to try to focus on what I need to do next.

I got the report that the level was starting to slowly lower, so I ordered RCIC initiated, and I believe

Mark Davis started. He reported a problem -- it appeared after he initiated that the speed was oscillating, and he ended up having to take manual control. I was inquiring, Do we have injection flow yet, and he said, Not yet; it looks like one of the inboard check valves did not open. Then he said, Okay, now I have indication of flow.

Let's see. What happened next?

MR. KAUFFMAN: Did he put it in manual?

MR. CONWAY: He placed the speed controller in manual. It's a flow speed controller type arrangement, and he placed it in manual. That steadied the flow out. The speed, pressure, and flow were all oscillating around, and that stabilized RCIC at that time.

MR. KAUFFMAN: Then he got the injection valve.

MR. CONWAY: Well, the injection valve had opened, but we were waiting for the inboard check to swing open. I don't ever recall him saying that it did swing open, but it did show that we were getting injection flow and we had a slowly rising trend in level at that point.

Also, simultaneously with that, pressure slowly started coming down, because RCIC was spraying in on top of the steam bubble inside the core.

I guess, prior to RCIC restoring the level, the level dropped down to a low enough value, 159.3. I think I received a report from the operator that the level was now

down to 159, and at that time I entered the emergency operating procedures; that's one of our entry conditions.

I made that declaration to everybody in the control room, that we had entered those; again, received reports on where we were. Once I entered the EOPs, I followed down through the RQ leg, which is dealing with power. Pressure was fairly stable -- we didn't have a problem with that -- and level was still lowering, but we had RCIC injecting, and I was expecting it to turn, at which time it did slowly start turning it.

I was in the RQ leg. I realized at that time that one of the conditions to exit RQ if there was a non-scram condition is all rods into at least 0-2. I realized at that time that we could not tell what the position of the control rods were, because the full-core display had gone black. We couldn't tell from the rod worth minimizer or the rod sequence control where the rods were. When we tried to select rods, of course, we couldn't tell where they were, either, on the full rod display.

At that time, I made the declaration to everybody, Be aware that, since we can't tell where the control rods are at this time, we believe we've had a scram, but -- since we can't tell the position of the control rods -- we are still in the RQ leg is EOPs, and that I'm exiting RL leg, which is our normal water level control in EOPs, and going

to C5, which is power level control, our contingency EOP.

I believe then, once I was in C5, I directed the ADS inhibit switches to be placed in on; that's one of the steps that has to be performed. Then I assigned, I think, another operator to come in, Brian Hilliker, who had come in early -- he was just starting a day shift -- to take control of RCIC and gave him a water level band, I believe, of -- I want to say 170 to 190 on wide-range indication.

MR. JORDAN: Who was that?

MR. CONWAY: Brian Hilliker -- I believe he was the operator assigned RCIC control.

MR. JORDAN: And he was on the next shift?

MR. CONWAY: He is actually a relief shift person who was coming in to work days. He had come in a little bit early.

MR. JORDAN: Okay.

MR. CONWAY: I also directed actions per -- you know, following down the RQ leg, is ARI initiated? I asked that question, and that report was, Yes, it had. I dropped through, got down, turbine was off the line, dropped through, I MSIV still open, got down to another decision block, where we have to start implementing actions per our EOP 6, our support procedure for taking action to insert control rods. I think the oncoming day-shift CSO was in at that time, also, and I assigned him that responsibility --

that was Dave Rathbun -- to do EOP 6, attachment 14, to start working that and seeing what we can do to insert control rods. I told him, I know at this time we don't have any indication, but we need to start working on something.

Sometimes during this time period, our aux operators all started coming back from downstairs -- all the lights had gone out in the control building, where they do their turnover -- and they came all running back up the control room to find out what was going on.

MR. KAUFFMAN: When you say lights off in the control room, you mean all lights, part of the lights?

MR. CONWAY: In the control room we still had lighting. As far as which lighting went out, you'll have to ask those guys; they were out there. I can't specifically say.

MR. KAUFFMAN: So the report to you, you don't remember.

MR. CONWAY: They never said anything about the lighting; they just all came running in. They saw that we were in some sort of event, that I was implementing the EOPs. I directed, I think, Aaron Armstrong and a couple other guys to go down to the normal switchgear building and down to the UPS's and check out what was going on; there must be a problem down there. Those guys went running out.

Of course, during this time we didn't have our

Gaitronics available, either. We noticed that was flat. We wanted to make a station announcement, the reactor scram, call the troops. That wasn't possible.

Also, Al Denny, who was our shift emergency plan coordinator, approached me somewhere in this time frame and showed me his recommendation for classifying the event based on EAP-2. He recommended site area emergency, based on loss of control of annunciators and a transient in progress. As soon as I read that, I said, I concur. I made the announcement to the control room. That was like 6 o'clock.

MR. KAUFFMAN: This whole discussion here is all in about 10 minutes.

MR. CONWAY: All in about 10 minutes -- a lot of things going on at once.

I believe at that time Mike Eron says, I'll call Unit One and have them make the announcement, because we didn't have our Gaitronics available. He went into the clerk's office, I believe -- or he did it at the phone desk; I'm not sure where he did it, but he made the phone call to Unit One. We didn't hear the announcement, because, of course, our Gaitronics were out. I assumed that they had done that, because then people started taking actions accordingly.

Eventually -- I want to say from the time I entered the EOPs, which was, I want to say, three to five

minutes after the initial event occurred, through the next five minutes, we eventually turned level. I don't remember the lowest it goes; I want to say 140 was the lowest at that time, before level started turning and coming back up.

Meanwhile, pressure was starting to slowly decay off. It was down in the 800s at that time, as RCIC started turning levels. The level was coming up, and the pressure was slowly starting to come down.

MR. KAUFFMAN: Is that normal for the decay heat you had or after other scrams?

MR. CONWAY: Is that normal? I would say I would expect it to do that because RCIC was running; it uses steam from the vessel as motive steam, and it also sprays inside the core.

MR. KAUFFMAN: I'm really asking your plant-specific -- You know, at some plants you might expect that it won't bring pressure down, based on what people see after transients; and at some plants you might say, yes, it takes enough steam, and that brings it down.

MR. CONWAY: I expected this type of thing to happen, and of course I had continuous updates on what level and pressure were from Eric Hoffman. He was keeping me pretty well informed. Every minute, I've got to say, he was giving me an update on what was going on. I was becoming aware of the fact that level was going up, was rising, and

pressure was lowering. Since we were in RQ and C5, we could not commence a cool-down until we knew where our control rods were. I was being very conscious of that and starting to get worried. This seemed to be our only injection source.

At the time, it looked like pressure, level were under control. Power was less than 4 percent, so it looked like we weren't in an ATWS condition because of the way the plant was responding.

MR. KAUFFMAN: Can I interrupt with a question here real quick?

MR. CONWAY: Go ahead.

MR. KAUFFMAN: You said it was your only injection source. Did you not have CRD? Did something happen?

MR. CONWAY: CRD was also running.

MR. KAUFFMAN: Okay.

MR. CONWAY: I tend to overlook that as an injection source. It's a very small quantity.

MR. KAUFFMAN: Sure.

MR. CONWAY: Yes, it was running and injecting, I guess you could say, at that point.

MR. KAUFFMAN: Okay.

You recognized that the EOPs wouldn't let you cool down at the point I interrupted. It was your only source -- RCIC was --

MR. CONWAY: I was starting to inquire about those other sources. We knew that all the instrumentation -- I also inquired on the drywell parameters. I think I assigned one of the guys coming in to find out what drywell pressure is; I need to know what drywell pressure and a full set of drywell parameters. I think it was Jay Lawrence I asked; he was one of the oncoming shift personnel, also.

At this time, people were starting to filter, a few at a time, into the control room. As soon as people were coming in, I was directing them out. I sent one of the other non-LOPs out, for instance, to check down on the local instrument panels on the reactor building, 261. I asked him to check level and pressure at the instrument racks down there to confirm what our level and pressure -- that the instruments that we were reading were in fact accurate. I was fairly comfortable, because both PAM recorders were indicating the same, both Div 1 and Div 2. These instrument racks, of course, they are strictly analog indicators, direct hook to the vessel, and there is no way that these can be misleading me. Since there was no Gaitronics, he had to run all the way down and come all the way back with a report. And, yes, his report confirmed that level and pressure were where we thought.

Let's see.

Right now the level is rising, the pressure is

lowering. It's going to get concerned with cool-down.

I made that apparent to Brian Hilliker, who was controlling RCI -- Brian, watch our pressure, I don't want a cool-down, don't drop below 600 pounds I believe I told him. I think I wrote down EOPs maintain 500 to 600 or something like that. I may have given him that band. I don't remember. At that time I think was just making him aware that we're cooling down -- that we don't want to cool down, maintain it above 600 pounds.

Level was back up in the normal band, I want to say in the 180s, in that range, when it looked like we were going to have a problem with pressure, that it was going to start lowering, continue to lower because RCI wasn't running and injecting and I had him stop injection with RCI at that time.

Level continued to rise and pressure continued to lower, get down to about 590 pounds and I was getting pretty concerned. It looked like one time it had stabilized and that was only for it looked like a period of a minute and then the next report I got was that, yes, it's still lowering.

Then I became conscious of another problem. The booster pumps, booster pumps were still running and I was concerned that once we dropped below their shutoff head that I asked close -- you know, I'm worried about injection from

the booster pumps at this time. We don't want that to happen, let's close the LB-10s for the feed pumps and then the report back was I got that we can't, they are locked up, we don't have any power to them, at which time I said does it look like we may be injecting with the booster pumps and they said we don't know, we can't tell. The instruments aren't registering that, at which time I said, very well, secure the booster pumps. We don't want injection from that source and during that time it was reported that the level had gone above 202 on their wide range recorders, the PAM recorders. The pressure was down around I want to say 530 pounds. I'm not real specific on the pressure. If I had a flow chart in front of me I could tell you about where we were but it was in the 500 range and level had gone off our indicator at that time.

MR. KAUFFMAN: Quick question. Did you just think that the booster pumps injecting or was there some procedural guidance that led you to that?

MR. CONWAY: I was aware of the fact that the booster pumps could inject, especially if the LV-10s were open. That would have been the only flow restriction in their flow path and since they had several options closed the feed pump discharge valves, which take about -- well, it seems to me about five minutes a stroke -- I don't think they take quite that long, close the 21s which are the feed

header stops and the same type thing. They're long-winded valves so I felt that securing the booster pumps was the surest way to stop injection if there was any from the booster pumps and the way the level was rising I had to believe with RCI secured, you know, we are going to get a combination of the level swell from cool water injection and I was concerned that, yes, they were injecting.

So we have a procedure that says if we reach Level 8, which is 2023, and if we believe we have booster pump injection we're supposed to take action to prevent that from happening because they are worried about over-filling the vessel, flooding up to the steam lines and then taking away pressure control.

During this time bypass valves appeared to be controlling pressure stable. That's when it was maintaining it around 940 initially, then the report I got was we had half a bypass valve open and then it ended up dropping up to a quarter open and that was I think the last report I got on bypass valve position.

MR. KAUFFMAN: That was real early on.

MR. CONWAY: That was much earlier, yes.

That was back when I first entered EOPs. I dropped down through and found out what I am going to use for pressure control. It didn't look like -- you couldn't tell if any SRVs were cycled unless you were there when they

initially did. I guess we found out afterwards that two SRVs did actuate but initially at that time we did not know that.

I don't believe anybody saw that. I personally did not see any SRV actuation occur. Of course one of the key indicators of that is annunciation of the valve actuation and we didn't have that.

We were about I would say pretty close to 30 minutes into the event now and the pressure was starting to stabilize right around mid-500s or mid to low 500s. Level was offscale high. We couldn't tell where it was when suddenly annunciators started coming back on and meters started coming back on scale and chart recorders started running and I breathed a sigh of relief and said, all right, we'd got annunciators and instrumentation back.

I immediately asked for a report of level. I still had an indication that it was still upscale, greater than 202.3 and shortly within I've got to say two or three minutes after that, it started coming back on and I got the report of 198 inches and lowering.

I then told one of the other operators that was in the control room -- I want to say Jim Graff, who had come in -- he's also a relief operator, he'd come in early for days -- to start making preparations to restart the booster pump. I wanted to be able to have those as an injection source.

I had -- somebody reported condenser vacuum was 23 inches and it looked like it was slowly lowering and so we started making some plans at that time. More people had come in and we had -- I was working with Mark Davis to try to get a plan for him and Mike Eron what's going on here, and we talked about stuff like -- started getting aux boilers running so we can establish shield steam for the main condenser and utilize that as a primary heat sink.

Booster pumps of course, available so that we could have a reliable source of injection in addition to RCI.

What else? Work on getting the condenser removal pump started, the hoggers to work on our vacuum problem.

We talked about -- let's see, early on after I had ordered RCI started I also ordered suppression pool cooling on RHR alpha pump and so that was -- that was circulating.

We wanted to make plans to get RHR Bravo and Charlie, which were in an out of service condition. We had just marked them up to our maintenance earlier that shift si we had started taking action to get that back.

MR. JORDAN: Which one was on means?

MR. CONWAY: RHR Alpha -- or excuse me, RHR Bravo and Charlie. They were out of service ECCS pumps.

MR. KAUFFMAN: The work hadn't started. They were just more or less tagged out but --

MR. CONWAY: We had valves de-energized that we were going to do electrical PMs on and pump control switches were in pulled lock.

MR. KAUFFMAN: That's not on the floor. He could have gotten them back relatively easily by --

MR. CONWAY: All we knew is we sent people out and they cleared the tags on the valves, turned the breakers back on so they were on in fairly quick time.

What else were we doing? There was a lot going on at once. I remember I was giving updates, you know, during this time period to keep everybody informed of what was going on and where we were going, where we are now, here's what we're doing, control level and pressure.

One of our plans was to assign someone eventually to use the -- to the bypass valves but at this time we still didn't know -- well, wait a minute.

We got power back and we had -- I got the report. Finally, it took about ten minutes because we had to go around and check, using the Rad Select and between that and RSCS and we had to restart the rod drive control cabinet, and finally we got core scanned and we got the report that six -- we could not tell the position of six rods and I made that clear in my update.

MR. KAUFFMAN: You were the Emergency Director during all this time?

MR. CONWAY: Yes. One of the responsibilities of the shift Emergency Plan Coordinator, of course, is to assist me in implementing that duty. He makes -- he can make an initial recommendation on classification. He ensures all the notifications are make to outside agencies, for instance. That's part of his duty.

Also during the first few, I guess I'll say the first ten minutes Tom Tuttle, one of our STAs, had come in to relief Al Denny and I asked him if he would verify that we are doing everything we can do for loss of annunciators. This is prior to getting the power back so he was pursing looking at that. We have had a procedure for loss of all annunciators but nobody thought we'd ever use that.

He was looking at that.

MR. KAUFFMAN: Did you have any problems sounding the sirens or making announcements?

MR. CONWAY: Once we got power back to the UPS we immediately made a follow-up announcement to let everybody know what was going on.

We also started getting reports that -- from the guys we sent out into the turbine building to start working on getting the aux boilers back and starting up the condenser air removal pumps, that were CAM, Continuous Air Matters in alarm in the building and of course we reported that to Rad Protection immediately and we made an

announcement to stay clear of the turbine building and then worked with Rad Protection to get people in and out and they were doing surveys of both the reactor building and the turbine building to find out what levels were in there.

It turns out there was no problem at all. They were I guess, quote, since we were running all our people through them, when they had to go out of the building they were keeping track of who was going where and that kind of thing along with our CSO. Of course he was keeping --

MR. KAUFFMAN: Maybe I'm jumping ahead. What time did you get relieved as the Emergency Director? We're not, it's not our charter to look extensively at the emergency planning aspects but certainly we're interested in how you got around your communications and how all the people coming in and being sent out in the plant and this and that and the other got handled.

MR. CONWAY: I got relieved as Site Emergency Director at 7:38 by Marty McCormick.

MR. KAUFFMAN: Did you ever start getting help I guess from the TSC and OSC?

MR. CONWAY: I found out afterward, it seemed to take an awful long time to me to even get communications from them. It turned out that there was a little bit of a problem at Security in that I found our, afterwards of course, that there was a couple TSC staff members that they

weren't letting them through even though they had emergency-related functions. That was just a matter that they had new ID cards issued, emergency ID cards and I think the guards just were not familiar with the new format and once they got that cleared up, they were in.

They got staffed up and then of course it was matter with me becoming comfortable with having time to turn over and so it wasn't like as soon as they got in there I was going to give it to them. I wanted to make sure the plant was in a stable condition, we had a plan of action and that we had backup contingencies like steam condensing available with all those normally de-energized valves for Appendix R purposes turned back on and available on Arch or Alpha in the event that we lost -- we couldn't maintain vacuum in the condenser -- that was going to be our heat sink.

When it looked like pressure had stabilized, we had gotten power back to our UPS's and we had a booster pump running finally and they were having problems getting injection into the vessel. Its level was starting to slowly lower.

It turned out the problem, they were -- comes with our, I guess our procedure has a start to booster pumps. They were worried always about our feed pump seals and would like to protect them, had a lot of problems with them in the

past, and what we did to start the booster pump back up was to close the suction valves for the feed pumps. My intention of course was to use the LB-55s, which are the high pressure, low flow feedwater control valves as a method of injection control in the vessel.

They couldn't get the feed pump suctions, the MOV-84 valves open because of the DP across them. The feed pumps were locked in. Downstream the MOV was like 200 pounds and upstream was like 700 and that was too excessive a DP and at that time we were restricting access to the turbine building and hadn't worked our plan out with Rad Protection yet and we hadn't gotten the survey results back and we couldn't send anybody in to it, which is where the location of the bypass valve is, to equalize around them.

They were feeding on the low flow, low pressure valve, the LV-137 at full capacity and the level was still lowering.

Got down to -- I started asking, well, you know, we need to find out what we can do and I think I assigned another operator to assist him and Jim Graff into working out what we can do to get injection we need to get that available.

I think the lowest level it got was I ended up re-entering EOPs on low water level when we crossed 159 again and we -- at about 140 inches I am thinking, the core is

still covered but we need to start thinking about getting RCI running again and available for injection.

I was just getting ready to get that work when my reports were the level looks like it's stabilized and it was at 133 inches and the next report I got after that was level is now 134 and slowly rising and it rose real slow.

During this time period still hadn't -- we were trying to get INC people in through the TSC. They were still being kept out off-site, into the building and computer people into the building to get the process computer restarted, the rad waste SPDS computer back up, get the INC guys in to -- INC people in to work on getting our control rod indication back.

We weren't sure where the rods -- we were showing a blank display on our four rod display and you couldn't tell -- we weren't getting the red full in lights on the RSCS and the rad waste minimizer was giving us conflicting information. It said all but one were in and then it said they're all in and then it would go back to all but one and we were getting conflicting data so we were still under the assumption that all rods were not in and we were operating under that restriction.

I had given direction to Jim Graff to feed slowly based on the fact that all rods were not in. We didn't want to get power excursions.

I told Mark Bodoh, who was watching level on 603 to be conscious of reactor power and notify me if we have any increase in counts on our SRMs.

MR. JORDAN: What were you injecting with to turn the level? You got it down to 133 and then it started to come to 134.

MR. CONWAY: It was with the condensate booster pump through the low flow, low pressure valve which has a limited capacity. It's like a four inch line and I think we were getting between 400 and 600 gallons a minute and then we said he started a second condensate pump and that got a little bit more flow because it increased the discharge head of the booster pump.

So while were trying to work on getting people to get rad indication back, it looked levels started to turn. It was being taken in control but rising in a very slow rate. Pressure was still fairly stable and now starting to recover and come back up and slowly rise.

So we had pressure coming back up, level coming back up, pressure rose about 600 or 700 pounds I would lose my booster pump injection so I started thinking we need to stabilize pressure at this pressure range and I assigned that task to R. J. Reynolds on the turbine bypass valves. I said R. J., maintain 500 to 600 pounds; we are in an ATWS. We don't want to cool down. Be conscious that we don't have

vacuum stabilized yet. We don't have the hogger on. We don't have steam seals. We are working on getting the boiler and hoggers running but in the interim you need to be conscious of condenser vacuum so if you get -- if vacuum drops to 15 inches I want you to close turbine bypass valves to protect the condenser.

Let's see. We began cracking the bypass valve to stabilize pressure using the bypass opening jack and pressure at that time stabilized right in that range, around 550. That level was still slowly, real slowly rising. Of course he was bleeding a little steam off and we were limiting the injection so it was coming up real slow.

During that time period Mike Eron pointed out to me in the RPD control of the OP there is an override in one of the weight blocks, or stop sign shaped block that gives you the chance that it says if the reactor is shut down and no boron has been injected you can continue past that stop and commence a cooldown.

At that time I asked what power was, so when he said ten to the third on the SRMs I said okay, we are definitely below the heating range and we haven't injected boron -- we can begin a cooldown.

One of our ODIs gives us a little description that part of our departmental policy is we feel that we are shut down if we are less than the heating range on IRMs, which is

less than range 6 or 7.

MR. KAUFFMAN: Sounds like a conduct of ops procedure, something like that.

MR. CONWAY: It is Operation Department Instruction on EOP implementation, lessons learned from simulator runs.

MR. JORDAN: What point is that? What's the condition you consider shutdown?

MR. CONWAY: On IRMs, below the heating range, which is range 6 or 7.

MR. JORDAN: So below 6 or 7 on the IRMs --

MR. CONWAY: We're fairly confident that we are shut down.

MR. JORDAN: As long as you are below the heating range.

MR. CONWAY: Correct and it was reported to me that we were on SRMs, about ten to the third.

MR. KAUFFMAN: We are probably interested in seeing that procedure. Do you happen to know the number of it? No?

MR. CONWAY: I don't remember the number of it, not specifically.

It gives that kind of guidance in there though.

MR. KAUFFMAN: Okay.

MR. CONWAY: It's not specific but we have been

trained on saying, yes, we can say that. Same thing with one rod is out. We know that our shutdown margin test covers the fact that our most reactive rod is fully withdrawn so if we had all but one rod full then we know we could still say we're shut down, fairly confident.

So he pointed that out to me and at that time we still had to stay in the power level control because it doesn't give me an out until all rods indicate in, so we were still in there for level control and it gives me a pretty wide band, minus 14 to 202 I think is my band at that point and I gave them the band. I changed the level band with the booster starting, 165 to 180, so that we didn't refill too rapidly and I told him to feed slowing and he said he was feeding as fast as he could anyway. The level was still coming up slow.

At that point things were starting to shape up a lot better. We had a lot more people in. Jerry Helker was in. He's -- I was asking him for advice and between he, myself and Mike Eron and Al DeGracia, who is head of the Op Support Department for us -- he was in also.

We were formulating a plan to where we were going to go and what we were going to do next and since we were now able to cool down, we could start lowering our pressure band and enable conditions to even get better.

MR. KAUFFMAN: About what time was this?

MR. CONWAY: This was right around the time I got relieved by Martin McCormick of the TSC, so it was about 7:38.

It's written down here. Let's see -- 0630 I had all rods in except for six, the six control rods and 0700 we had finally got the indication that all rods were in and we had done stuff interim to that, trying to -- we hadn't gotten RNC techs in yet. We were working at EOP 6, Attachment 14, and one of the things we can do is reset the scram.

I think it was Dave Rathbun we felt that one of the reasons we may not have had indication of these rods is they may be over-driven in, and that by resetting the scram it may allow them to settle out to 00 and get an indication back so I said very well, let's take those actions.

Well, one of the things that we needed to do is then install the RFS jumpers. I said make it so, and he installed it. We reset the scram and we got our rod indication back at that point.

MR. JORDAN: And that is what you were looking for before you started cooling down, was the rod indication for the six rods?

MR. CONWAY: No. We didn't need that specifically because the RP leg says if you are shut down and no boron has been injected and the determination was mine that since

we were below the heating range on IRMs we were in fact shut down and that, you know, when I made that call and made the announcement that we were transitioning here to be conscious of power rising on SRMs, notify me immediately, I told Mark Bodoh, who was over on 603 panel.

Once we installed the RFS jumpers and reset the scram we did finally get an indication of all rods in and then it took a while for them to confirm that also, but they checked it on several sources and the rad waste minimizer was showing still one rod and we had full-in on full core display and full-in on RSCS but our rad waste minimizer was still in and out whether or not whether that rod was in or not.

We had it at least confirmed on two different indications.

In any case, one rod is definitely within our shutdown margin requirement.

Shortly after that, the process computer got restored; the computer techs came in and restored the process computer.

MR. JORDAN: So you're saying you started cooling down around 7; is that what you said? I was just curious.

MR. CONWAY: Specifics as far as time? I don't remember a specific time that I gave that. Let me think here a minute.

I remember Mike had planned that out to me, Mike Eron. I don't remember specifically when that was, time-wise. I know it was before we had all the rods indicating full in, though.

MR. JORDAN: Okay.

MR. CONWAY: And that was at 0700. It had to have been 6:30, after we got our power back to the UPS's, and 7:00, which is when all rods were indicated full in, except for -- yes, all rods were indicated full in at 0700.

MR. JORDAN: Okay.

MR. CONWAY: It had to have been fairly close to that time period, because we logged here we started the booster pump at 0640, and that was right after we had restored power. We had worked on getting that back; we had people out in the plant to do that.

We restored power to the UPS's at 0622.

Then, at 0738, I got relieved by Marty McCormick. I turned over to him where we were, what my intention were on what we do with the plant, and my feelings that things had stabilized fairly well and that I was interested in turning the site emergency directorate over to him. He said, Yes, he was ready, and we conducted a turnover over the phone. He relieved me of that function, and I made the announcement to everybody in the control room. We continued to cool down the plant.

You know, we placed RCIC in standby after making sure the booster pumps were running. We lowered our pressure band; we waited a full hour maintaining 500 to 600 pounds so we'd ensure we didn't exceed our cool-down rate. I think at quarter after 7 I lowered the pressure band 300 to 400 pounds.

Over the next couple hours, we just worked with getting things going. One of those things was trying to work with the OSC, ops support center, to get people in and out of the plant and get damage control teams out looking at UPS's. I discussed early with Marty McCormick about his interest in trying to get the UPS's back on their normal power supply and have the maintenance and DC available again as a backup. We formulated a plan, and we discussed this with Jerry Helker and Al de Gracia, Mike Eron -- the group of us in the control room, the senior management guys. We got together and came up with a plan of doing this, going from the Charlie and Delta, Bravo, Alpha, and Gulf, in that order, to minimize the possibility of losing one of them in the interim. We didn't know the status of the UPS's, other than that they were on a maintenance power. Doing the lighting ones first, Charlie and Delta were the minimum impact, other than that we would have lost half our Gaitronics system, our alarm announcement system, if one of them failed to transfer successfully. But we successfully

transferred all of them, except for the Alpha and Bravo, which were the major instrument bus suppliers.

My concern, of course, with those two was that at that time feedwater level control was in automatic on the LV-137, feeding with a booster pump, and the impact was that we could have lost that feedwater level control function. Everybody was aware of when we were doing that, and we were keeping TSC updated and posted.

Then we started shutting down our auxiliary systems, off-gas, steam generator-injectors. I got a report that the vent GEMs -- or, no, the stack GEMs -- had given us an alarm, saying it was inop, and we notified the dose assessment advisor, and he was going to get grab samples arranged for. We got results back.

MR. KAUFFMAN: Who is responsible for the samples?

MR. CONWAY: The chemistry department does it through the dose assessment advisor. They send out teams from the OSC to do that.

MR. JORDAN: Information like that gets fed through the control room, and then you feed it from the control room to the TSC; is that how that works?

MR. CONWAY: Correct.

MR. JORDAN: Okay.

MR. CONWAY: Of course, during this time, I was doing updates with Al Denny, the shift emergency plant

coordinator, 30-minute updates on where we were and where we were going, as far as further notification purposes.

Let's see. Did I forget anything?

We continued to shut down the auxiliary systems that we no longer needed that were part of the steam plant. During that time period where I was concerned about cooling down. I had ordered Jim Emery to work on using OP-101-Charlie, which is our shutdown procedure, to start closing off aux steam loads and steam drains to lower our pressure reduction. That helped stabilize things, too, finally, as far as pressure. That was back early on, though, before we got power restored.

Other things we did: We started our shift checks for -- we call them S et al., which covers all our different modes and assures we have the required instrumentation available to monitor the plant in all five modes of operation. It covers all those things. We started those to start checking our instruments.

Also, early on, it started the OSP-RCS at 001, which monitors your cool-down rate. Earlier on, we were concerned -- it was like shortly after we had declared the site area emergency, and I wanted somebody watching that specifically. I think it was Rich DeLong. He was watching that specifically and keeping me informed of what our rate was.

MR. JORDAN: He was monitoring the cool-down rate based on --

MR. CONWAY: He was using steam pressure and saturation tables to monitor the cool-down rate.

MR. JORDAN: Okay. That's what his function was, though.

MR. CONWAY: Yes.

MR. JORDAN: Okay.

MR. CONWAY: He ended up turning that over to somebody else, I believe, later on, but initially he was the one keeping track of that.

We also began restoring the things we had overridden -- ADS -- placed those back in normal -- ADS inhibits, which is back into normal -- and removed the RPS jumpers we had installed to reset the scram once we had risen above 159, the low scram setpoint, or reactor water scram setpoint.

During this time, Mike Eron was trying to get me to start a cool-down, and I was hesitant to do that, because my level was still low. I felt that, if I had started a cool-down and begun lowering, I was going to cook my level off, and then I would have less inventory. With lower pressure, granted, I might be able to get a little more injection flow, but I wanted to make sure level was back in a stable band. Once level got back up to 180 inches, I

directed the pressure band to be changed at that time -- that in conjunction with the time period that all this occurred. So like at quarter after 7, I said, Okay, we have water level now, and now we can lower our pressure band 300 to 400 at that time.

Eventually -- and it seemed like forever -- I got relieved.

MR. KAUFFMAN: What time was that?

MR. CONWAY: I want to say 11 o'clock, pretty close to 11 o'clock. I don't have the exact time written down in my log here, but right around 11 o'clock -- 10 of, something like that. We started a turnover. George Moyer was my relief.

MR. KAUFFMAN: You had an exciting morning.

MR. CONWAY: Yes. Then I went home and had a cocktail.

[Laughter.]

MR. KAUFFMAN: And had to get back in at midnight.

MR. CONWAY: That's right.

MR. KAUFFMAN: We won't get into how much shift work he's allowed to work.

[Laughter.]

MR. CONWAY: I met the requirement. You mean the eight hours off and all that?

MR. KAUFFMAN: Yes.

MR. CONWAY: I had the eight hours off. Is that what you mean by the shift work requirement? No more than 16 hours, eight hours on the panel.

MR. JORDAN: So, during your time up until 11 o'clock, was it the suction valves for the feedwater that were closed, so that you could not equal-pressurize around, so that you could get -- You were just using your -- You were feeding with your condensate booster through the --

MR. CONWAY: LV-137 valve.

MR. JORDAN: LV-137?

MR. CONWAY: That's correct.

MR. JORDAN: Okay.

So when you left, they were still feeding through LV-137? Was that the level?

MR. CONWAY: Startup valve, low-flow, low-pressure, feedwater control valve.

MR. JORDAN: Okay.

MR. CONWAY: I may have missed a few things here and there in my recollection of what happened, but a lot of things were happening at once.

MR. JORDAN: We're here for 10 days, trying to figure out what happened and reconstruct the event.

MR. CONWAY: I think the best reconstruction occurred at the initial debriefing, to tell you the truth, where we had everybody that was there inputting all the

information. That was all we did, and we ran it like our simulator critiques that we have at training. We don't tell people what we saw; we just ask -- what did you see, you know, and just poll everybody that was there. People supply everything. It pulls a picture together a lot better.

MR. KAUFFMAN: This question probably has been asked before, because Gene was here and it's Gene's favorite question: Were there any things that you would like to have had? Obviously, you'd like to have the UPS's.

MR. CONWAY: The UPS's would have been a nice thing to have back.

MR. KAUFFMAN: But do you have any ideas of things that could have made the response better or that you would like to have had that would have helped, or, for the things that you felt happened good, is there a reason that you think is important enough that everybody should have?

MR. CONWAY: The fact that we had a separation between normal instrumentation and, of course, divisional safety-related instrumentation was a major factor in helping figure out what we had now. When the event first occurred, we were scrambling to find out what we did have.

All our balance-of-plant equipment continued to run. The fact that we couldn't monitor it -- it still ran fine. That was, of course, a plus. We didn't have to deal with any major losses like loss of our condenser. That kind

of thing would have really complicated things. I mean, it would have made it more difficult to stabilize the plant, but it could have been done, in my opinion.

That, alone, helped us grasp control, to assess what we had, take the necessary actions initially, and grab control of what we had and stabilize the plant with the minimum number of people we had there, until we could get more people coming in. It worked.

RCIC worked. There were little problems with control. The oil has to heat up, and we don't run it routinely; quarterly is about all we ever run it.

Those kinds of things all help pull it all together to tie it up.

We had, still, all our drywell parameter indications available from the divisional meters. We knew there was no concern with the drywell. Although drywell temperature was starting to rise, one of the reports I got was that drywell unit coolers had tripped off. Mike Eron specifically brought that to my attention, that temperatures were rising, pressure was slowly rising. I think the pressure got to 0.7 psig, and the highest temperature was reported at 165 by Jay Lawrence. He said he had one at 165, one at 150, and the other four were at about the 130- to 140-degree range. I assessed that and felt that I didn't need to enter the primary containment EOPs. I knew that the

reason they were rising was that drywell cooling was off.

The fans had tripped. The cooling water valves were still lined up, which are primary containment isolation valves; they were still lined up. We didn't get an isolation. That would have been another thing. They come off another, separate UPS, the 3-series UPS, for all that primary containment logic and scram logic and all that. I'm thankful we didn't have a problem -- if primary containment had bottled up, with MSIVs shut, that would have pretty much sent us into using SRVs as pressure control and the suppression pool as our heat sink. That would have made things a little bit more difficult still, but I think we would have had it all under control eventually.

Other things that helped: having people knowledgeable enough to know how to re-energize the UPS's available at the time. That was a plus. There was a certain --

MR. KAUFFMAN: Is that normal, that people know how to do that, or was that some expertise that just happened to be there that day?

MR. CONWAY: I think there are enough people that know that, because of the way they have the shifts complemented out -- I want to say that the people of my vintage, for instance, we had some training on doing that because we were involved extensively in the start-up program

here. There were enough of us that were involved or working with marking these things up for maintenance that, I think, the diversification of enough people were on each shift that knew how to do it -- I guess I'm just pointing out that I was lucky enough to have one on my shift at the time.

MR. JORDAN: Do you know if it's the normal training program to have people know how to do that?

MR. CONWAY: I don't believe it is.

MR. JORDAN: In your normal routine, refresher training or anything like that, there's not a normal --

MR. CONWAY: We don't cover how to restore from a loss of all UPS, no. I mean, that's something you don't even conceive of happening.

MR. JORDAN: Okay.

MR. CONWAY: We talk about transfers back and forth, what causes them, that kind of thing, and how they work. Of course, that how-they-work type thing, coupled with the way the failure looked, we didn't observe it as a load problem, because all of them went. All but that one series -- every one of them -- had tripped. For that reason, we didn't feel it was a load problem; it was just a matter of getting the power back. Whether or not it was available was -- [Pause]

MR. JORDAN: I'm just curious about what parameters you were monitoring. You stated you had an

individual at the -- was it 603?

MR. CONWAY: The 601.

MR. JORDAN: The 601?

MR. CONWAY: Yes.

MR. JORDAN: -- that was looking at the level and pressure and maintaining the level with the RCIC.

MR. CONWAY: Correct.

MR. JORDAN: You mentioned you had somebody that at least -- You got reports back on a continuous basis; you said once every minute or some period of time.

MR. CONWAY: Three minutes, sure.

MR. JORDAN: Well, you felt comfortable knowing your knowledge of at least level and pressure. What other parameters did you have a feedback or a person that, while you were in the condition, for the 30 minutes or whatever --

MR. CONWAY: I was getting parameters on drywell, primary containment conditions --

MR. JORDAN: On a continuous basis?

MR. CONWAY: Not on a continuous basis. When I got the initial set of parameters for the containment, I felt that there was no cause for concern in the containment, other than the slowly rising temperature; we started taking action to correct that. Once we got power back, of course, I know Mike Eron was looking into the printers to try to

figure out how to get some jumpers in, to get the unit coolers back running, because ultimately we would have ended up in those.

We tried our LOCA bypass, which is our normal way of --

MR. JORDAN: Oh, they didn't come back on as soon as you got power back to them?

MR. CONWAY: When we got power back on, we then had power to allow the LOCA bypass switch relays -- the switch is actually relays to bypass the contacts. Those relays were de-energized when the UPS's went down, so, even with our LOCA bypass switches on, we could not restart the fans; the valves were fine, but we couldn't tell the fans, Hey, the valves are really open, because the relays wouldn't pick to allow that function to occur. Once we got the UPS's re-energized, it was just a matter of going back and restarting the fines to get drywell cooling restored, and that's exactly what we did.

MR. JORDAN: Did you have somebody go out locally to reset the relays?

MR. CONWAY: The control switches are on one of the panels in the back of the control room.

MR. JORDAN: Okay.

What other parameters did you have somebody stationed at to give you some type of a feedback? Level,

pressure, containment --

MR. CONWAY: After we got our power back to the UPS's, somebody was monitoring power at 603.

MR. JORDAN: Did you have somebody monitoring power before that?

MR. CONWAY: Prior to that, no. After the initial report Mike Eron gave us that EPRMs were down-scale -- I think Dave Hanczyk was back there with him, too -- Mark Davis, I think, was driving in detectors at that time. I think, as a matter of fact, Dave Hanczyk asked, Well, how are we going to know what power is if we're coming down? I said, Well, we can always look at the meters, the IRM meters on the back panels, on the drawers. He says, All right; I'll go check those. I know he went and looked at them -- I believe he did. I don't know specifically that he did. He never gave me a report back that he did, but Mark Davis was telling me that we had down-scale indications on IRMs when they would come in, so he was giving me feedback from that aspect -- that, yes, power was tracking down -- and then, when we got our front-panel meters restored, we got reports that we're on SRMs now and that they're trending down, also.

MR. JORDAN: I'm somewhat confused. You originally went back and looked at the EPRMs that were indicated down-scale, the LPRMs that were indicated down-scale, which indicated that the reactor power was down.

MR. CONWAY: Less than 4 percent, yes.

MR. JORDAN: Less than 4.

And that was early in the program.

MR. CONWAY: That was one of the first things we did.

MR. JORDAN: Okay.

MR. CONWAY: We knew where pressure was; we knew where level was; we needed to plan where power was.

MR. JORDAN: Okay. Then, from that time until you got power back, with your 601 panel -- is that what it is, the main panel? Is that 601 or 603?

MR. CONWAY: It's 603, where the full-core displays are.

MR. JORDAN: Okay, the 603 panel.

-- until you got power back to your NIs from the 603, who was doing what as far as power goes?

MR. CONWAY: I didn't assign somebody specifically to monitor power.

MR. JORDAN: Okay.

MR. CONWAY: I believe Mark Davis was doing that, when he could. I know he was driving in detectors, and I don't know if he was going back and checking it or not. I didn't get any further reports until after we got power restored, and that we were on SRMs.

MR. JORDAN: Okay.

MR. CONWAY: I believe he had driven the detectors in and he was ranging down on the range switches, because he had down-scale alarms in on that 603 panel. So I believe he was monitoring it, and I believe one time he also reported to me that IRMs down-scales are in, but, until the chart recorders got power back, we couldn't track them on the front panel, and I don't think he felt comfortable enough to leave the front to go to the back to check, but you can ask him.

MR. JORDAN: Okay.

MR. KAUFFMAN: I guess I have a couple more follow-up questions.

This one I brought with me from Washington, because of the 50.72 report that initially came in. It said that pressure control was lost at the start of the event, and I was wondering where that came from, if you guys said that or we got it wrong on our end or I have a misunderstanding.

MR. CONWAY: I have never said that, and up to this point I have never heard we had lost pressure control. I've got to believe that, based on the load reject that we took because of the main transformer fault, yes, in fact, pressure did go high enough to pick up two SRVs on pressure-relief function. If that constitutes loss of pressure control then that's why they said that, but I don't believe

at any time I had lost control of pressure, and I was taking actions, if I felt I was getting that way, to control it, and I did.

MR. KAUFFMAN: Who made the red phone calls here?

MR. CONWAY: Our communicator. Initially it's done from the control room by our rad waste operators, who are trained as communicators. Basically, they read the fact sheet that's prepared by our shift emergency plant coordinator and authorized by myself as the SED. They read that to the red phone line.

MR. KAUFFMAN: You don't recall signing anything like that.

MR. CONWAY: That might have come from the TSC, but no.

MR. KAUFFMAN: Okay.

MR. CONWAY: All we made mention of was loss of annunciators and that all rods weren't in and that kind of stuff. The rod position was unknown, and level and pressure were stabilized.

I'm not sure where that came from. That's interesting, though. I wouldn't even perceive it that way.

MR. KAUFFMAN: Ultimately I can go back to Washington, I guess, and if need comes up we can have them play the tape, because those are all taped.

This week has all been kind of hectic for me, too.

In fact, I had a good Tuesday. I was not working Tuesday. When I came in, I grabbed the reports that were there and talked to people about what happens. I may have, in haste, misread it, or it might not have been a report from when you were there. I don't recall the specifics of the 50.72 phone call.

MR. CONWAY: It was approximately three hours in, I believe, that TSC called over and had one of the -- I think it was, as a matter of fact, Tom Tuttle at the time -- asked him to check on a few indications. One of the things he was looking at was SRV temperatures. As soon as he read the recorder, he said he showed two that had spiked significantly higher than the rest, or showed two spikes, I should say. He said that may have indicated an SRV. He reported that to me, and I said, Well, keep the TSC informed and let them know what happened.

At that time, we suspected that those two had lifted, so we initiated our procedure for cycling our drywell vacuum breakers, which is supposed to be done within two hours. Of course, we didn't even think that we actually had an SRV. We had no way of telling that; no one had seen the valve actuate, as far as indication of the change. And our annunciation was lost. That first ten minutes was a lot of unknowns in there.

One of the things we didn't think to look at was

that recorder. There was no power to that recorder, anyway; it wouldn't have shown anything. At least I don't believe there was power to it. Obviously there was something, or the residuals were still there from when they opened, to show the spikes. I'm not sure.

MR. KAUFFMAN: I guess another question I had was what you've said and what we've heard from other places: that the RO recommended a scram, and I guess my basic question is just the background and what's the policy on when ROs initiate scram, when they recommend scram.

MR. CONWAY: Well, I had already come to that conclusion and was basically waiting to hear what power was.

MR. JORDAN: At your ASSS?

MR. CONWAY: That's correct.

MR. JORDAN: That's the assistant?

MR. CONWAY: The assistant station shift supervisor.

MR. JORDAN: Your assistant. Okay.

MR. CONWAY: He becomes the legal STA once we enter the emergency plan.

MR. JORDAN: All right.

MR. CONWAY: He had just come from the back panel. I was at the 601 panel, looking at the level and pressure. I recognized that some event had occurred, other than just the loss of the annunciators, and, when I had turned my head

to look at the 603 panel, on 602 recirc pumps had down-shifted and I had come in at that point. At that minute, he said, I recommend we scram. I said, I agree.

It's ultimately my call to direct that, unless one of the reactor operators -- or senior reactor operators, for that matter -- feels that conditions warrant that, and they don't need to wait to be told to do that.

MR. KAUFFMAN: My question was really, is it a requirement they do it? Is it a courtesy? Is it something that, if they're not really sure, they tell you what they think and let you make the decision?

MR. CONWAY: That's correct, and they're always told that: if they're not sure, they're supposed to raise that question, of course, to the SSS, and he makes that decision. That's why I get the big bucks, right?

MR. JORDAN: Right.

[Laughter.]

MR. KAUFFMAN: You got the big bucks for what happened on Tuesday.

MR. CONWAY: Right.

MR. KAUFFMAN: Another question I had is, I guess a lot of people eventually came up to the control room, and I guess the question of crowd control and how you maintain control of the people and how you got them to do what you wanted without losing control of them and having all those

people running around doing things you didn't want to do -- just how you handled that whole thing.

MR. CONWAY: Congestion in the control room -- it started building a couple times. What I did is, I just grabbed the first person I saw, and I would say, Clear everybody out of here that isn't actively doing something right now. The control room is getting very congested and noisy. I could have yelled out, Hey, everybody shut; anybody that doesn't belong here, get out of here. But I know Mark Davis had assigned people to do certain functions, as to the CSO, because I had given him tasks to perform. Rather than just clear everybody out and then find that those people were actually doing something over here, I wanted to let this person -- I had to do that twice, and the person that I did assign that to, they would walk; they would ask somebody, Do you have business here, or are you just hanging -- because that's our assembly area, also, and that promotes that congestion. If they said no, then they were asked to move someplace else in the control room; the noise was becoming a bit much, and the congestion.

That's how I ended up clearing the control room twice.

MR. KAUFFMAN: It was really two parts. It's how just basically you can manage it, how you control the crowd and then to some degree how you kept track of what

everybody was doing and --

MR. CONWAY: Through Mark Davis -- I would continually check with him on what's the progress on the board, the hoggers, who's working on it, you know, and he would say so-and-so is working on that, so-and-so on this, this and that. He knew who was doing what where and of course the people in the control room that I had assigned positions I kept aware of them.

You know, like I assigned one of the other CSOs they had coming in the duty of following along with what we are doing here and OP-101-C, our shutdown procedure, and verify, try to parallel it and confirm and one of the things he pointed out was our cooldown rate is limited from normal temperature down to 450 degrees because they're worried about crudburst and complicated chemistry controlling the core and he pointed that out to me after I had R.J. Reynolds, who was controlling pressure and at that point we had started a cooldown rate that I told him 100 degrees an hour was his rate and don't exceed that. He had just -- I don't think he had even started yet. He was still in the pressure stabilization type process when Bob Spooner had pointed that out to me, that 25 is the limit and then of course at that time I corrected, made the correction to my order to limit down to 25 down to 450.

MR. KAUFFMAN: If the people in the plant ran into

problems or had questions they were dealing with the CSO?

MR. CONWAY: Yes, unless there was something that they felt needed to be brought specifically to my attention or Mark would bring them over to me and say this and this and this and we would make the necessary decisions.

A lot of them were done as a group like that. We would get together and talk as a group -- here's what our plan, here's how we're going. We've got a lot of contingency backup in case this fails or this fails. We look like we are in good shape here.

MR. KAUFFMAN: Can you recall any problems that the people out in the plant had that needed to be brought up and resolved?

MR. CONWAY: One of the those problems was after the TSC got mad and the OSC everything had to go through the OSC as far as for accountability process, right?

That as far as I am concerned bottlenecked our recovery. I mean it slowed it right down because we had to physically at first send people over to the OSC, which is at Unit One and then they would be dispatched as part of a damage control team out to the plant, which later on we got them to change that into just notifying them who was going out and where but initially that's how they were running it. Boy, that slowed it down a lot!

MR. JORDAN: How did you communicate with the OSC

in Unit One?

MR. CONWAY: Through our communicator. Gus had a phone number we could dial. We found out what the phone number was.

MR. JORDAN: Was communications available? I mean was --

MR. CONWAY: We don't have a direct line to the OSC. To the TSC we do and basically we would tell people, you know, the TSC, that we are sending people out to go do this and then they would notify the OSC and then the OSC would call and say, hey, you need to send them over here. We'd say "Aw-w-w."

MR. JORDAN: How about just normal communications. I mean you'd use the telephone, okay. Is that because the communications was lost or that is the normal method you would have done it like to the TSC or the OSC?

MR. CONWAY: TSC is done by phone.

MR. JORDAN: Okay, how about the OSC?

MR. CONWAY: OSC we do not have a dedicated line for that but of course any phone in the control room could have called them.

MR. JORDAN: So that is how your normal communications --

MR. CONWAY: With the OSC.

MR. JORDAN: If you hadn't lost your power

supplies, okay, you would still have had the problem with the communications that you had with the TSC -- not the TSC but the OSC.

MR. CONWAY: I don't know if I would call it a problem, other than the fact that it was more of a procedural type thing.

MR. JORDAN: Okay.

MR. CONWAY: Right? They were saying, oh, you've got to come over here to do it. It wasn't really a communication type thing.

MR. JORDAN: Okay.

MR. CONWAY: Initially the only communication problems were okay, we couldn't make an announcement to everybody on the site, in the Two site, right?

Unit One had to make that call and the Gaitronics merge when either stations makes, sounds one of the station alarms -- the fire alarm, the station alarm or the evacuation alarm, both systems merge and the announcements are heard at both stations simultaneously, but we lost our Gaitronics and so their station announcement -- they heard it at their station but nobody at our station did.

MR. KAUFFMAN: Was there some kind of a contingency or backup to deal with that?

MR. CONWAY: Not that I am aware of.

I was asked to speculate on that the other day and

my answer to that was I would have probably contacted security and had them dispatched to various locations of the plant and make sure people were kept informed that they were supposed to be at their assembly areas.

Of course there were very few people on site at that time anywhere so when Security was notified that that was occurring they stopped everybody from coming in and that helped for accountability purposes and notification of people.

The Gaitronics of course -- one half is powered off of one UPS and the other half is powered off the other UPS and then our radio system, Leaky Wire, is powered off a third UPS, so chances of losing all three simultaneously were pretty --

MR. JORDAN: -- remote but it happened.

MR. CONWAY: -- remote but it happened, yes.

MR. JORDAN: So you don't know when you notified Unit One to notify the plant whether or not that notification actually went into Unit Two or not? Or you do know?

MR. CONWAY: We did not hear any announcement over the Gaitronics in the control room, let me put it that way, and we would have heard it -- we routinely hear it every Friday they test their station alarms and we test ours.

MR. JORDAN: Okay.

MR. CONWAY: And we usually hear theirs in the control room and I didn't hear it, so I've got to believe it did not go out.

MR. KAUFFMAN: I've got some more good questions here.

One of the questions I have was as the UPS's got re-powered and started getting their annunciators back, how did you go about I guess looking at them and figuring out if there are more problems. How did you just handle the situation of the alarms coming back.

MR. CONWAY: The people on those boards handled it.

For instance, Brian Hilliker was assigned a 601 panel. He was over there running RCI and then I had him relieve Eric Hoffman for moderating level and pressure because he is a reactor operator and Eric was just non-LOP initially. He was all I had so I stationed him there. I wanted my ROs doing other things.

He responded accordingly by the procedure to the alarms that were in. If he felt that something needed to be brought to my attention he was going to do that.

I did not give any specific directions on, you know, if there are any abnormal alarms, let me know. Everybody knows. If it's abnormal, they're going to let me know. They have to. The procedure will even say notify the

SSS right in it and so as the alarms came back in, of course some of them were fast flash, some slow flash, which means the condition had been an alarm and cleared, they would have kept me notified.

I didn't get any notification of anything abnormal from annunciators that were received or cleared, that I recall.

MR. KAUFFMAN: I guess these two are kind of tied together here. It just occurred to me now and it might have been a good thing to write them all down since -- I guess the printer and stuff wasn't working then but --

MR. CONWAY: Oh, I see, yes. Hindsight.

MR. KAUFFMAN: It just occurred to me too, but that's like one of our assistant SSS's was -- he had gotten there early also and he was walking around with a pad of paper, keeping a rough log of what was going on.

MR. KAUFFMAN: That was my next question --

MR. CONWAY: When I saw this log --

MR. KAUFFMAN: That's where a lot of this information came from. No offense to -- I guess it is your writing in here early on --

MR. CONWAY: This is me, yes!

MR. KAUFFMAN: It's kind of sloppy and then when the event happened it gets neat and --

MR. CONWAY: What we did was, this log was

generated from I've got to say three sets of notes, one that was kept by Jerry Hilliker, who had come in after the event had occurred. I am not sure specifically what time he came in.

He and I together worked out the site emergency director checklist to make sure we were doing everything we had to do prior to being relieved by the TSC.

Don Bosnick, who was the Assistant SSS that was oncoming, who had come in early to start a turnover, he had kept some notes, and then Mike Garbus, who is one of our CSOs on relief shift who had also started keeping a rough log from approximately seven o'clock on when he came in.

In between all those three notes, basically between Mike Eron, Mark Davis and myself, we read through what they had written down and filled in blanks where they weren't sure of what was going on when and then I told Don, put in a log, Don, and that is where this log came from.

So it is not like we were writing during the whole thing. I personally -- the only place I was writing was on the EOP boards. That's where I was doing my writing.

MR. KAUFFMAN: We would be asking other questions I think if the reactor melted but you kept a really good log!

[Laughter.]

MR. KAUFFMAN: So -- this is kind of an EP

question again that just occurred to me. Do you know what you would do if say you hadn't restored the UPS's and the TSC is now up and activated, right, and they want information on point parameters and this, that and the other and your SPDS is down, your computer is down -- well, I'm guessing. I would guess in the E-Plan there is some way to get information to the other emergency response facilities that need if the primary means are down.

MR. CONWAY: The communicator, the communications aide who is in the control room, of course is in direct communication with the TSC the whole time and with the communicator on the other end and they have I believe a data sheet they ask for parameters for and basically he would say ask me or someone else -- I think Don Bosnick who as a matter of fact was taking care of a lot of that because I wasn't aware of them asking for anything --

MR. KAUFFMAN: What about the old paper method?

MR. CONWAY: Basically the paper method, yes. They had a checksheet and for different parameters and they would have asked for those and if we had the instrumentation available we would have given them what they wanted. If not, then it would have been sorry, not available or we would have tried to figure out how to get that information for them, if it was important.

You would be reading it to them and they would

have a similar sheet on the other end of the phone and writing it all down and that's how they would get it.

MR. KAUFFMAN: I used to run drills. We'd break these sort of things to force the communications channels because that is a real good way to check the effectiveness of the communications in the organization if you are a drill controller is to interject something and see how long it takes to come out the other end.

MR. CONWAY: There is also another method. Of course they have the remote video camera that is controlled from the TSC.

MR. KAUFFMAN: Oh, I didn't see those up there.

MR. CONWAY: It's in the control room and I don't know when they pull the lens cap off but of course from that they can -- zoom in, zoom out and they can get a lot of the front panel information themselves. They can watch me pull my hair out, do anything they want, so that was available as another information-gathering device.

MR. KAUFFMAN: Where is that --

MR. CONWAY: I have no idea.

MR. KAUFFMAN: That's a rhetorical question.

MR. CONWAY: I understand. That didn't need an answer, eh?

MR. KAUFFMAN: Well, let's see. Anything on my list that we didn't cover? We might let Mike talk about

this one.

MR. JORDAN: Maybe we've already explored this and I have missed the concern, and that's if you didn't get the UPS back in a half an hour and it would have continued to be out, what was the major problems that you had? I mean you're into this thing half an hour and the adrenalin now is down to the point where you are doing something that is pretty stable, hopefully stable. What were your major problems that you had as far as if this thing went on for a long period of time that you had to overcome?

MR. CONWAY: The level was fairly well under control. The pressure was under control. Establishing a permanent form of heat sink would have been difficult. For instance, no vacuum indication would have been -- they had no idea what was going on in condenser vacuum and that was another thing I did. Somebody said, well, we don't know what the condenser vacuum is doing right now and we had half, that was when we had half a bypass valve open, right, so I'm like -- yeah, we better send somebody out to look at that, so I dispatched a non-LOP -- well, actually I think I told Jim Graff send somebody out to check condenser vacuum locally and get back to us on what we have.

MR. JORDAN: And did they do that?

MR. CONWAY: Because Gaitronics was down, the Leaky Wire system is down, they had to go out to the plant

and then get their reading and then come back to the control room.

MR. JORDAN: Did they have problems in doing that? Do you know?

MR. CONWAY: Did they?

MR. JORDAN: Yes.

MR. CONWAY: I didn't receive a report that there was difficulty doing it other than they were breathing hard when they got back.

I think that may have been the guy that reported the CAMs were alarming out in the turbine building, you know, and of course one of his responsibilities is to see if it is reading anything and get out of the area.

MR. JORDAN: Okay. We had some indication there were some lighting problems and I think you alluded to it earlier, that there was some lighting problems.

MR. CONWAY: I wasn't aware of any in the control room.

MR. JORDAN: As far as the control room lighting you noticed no degradation of the lighting system?

MR. CONWAY: I don't recall ever noticing it.

MR. JORDAN: Do you know what kind of lighting problems they had out in the plant?

MR. CONWAY: I understand that --

MR. JORDAN: What reports did you get?

MR. CONWAY: -- that control building lighting was out. I didn't receive any reports during it. Afterwards, in the debriefing it came out that lighting was out.

MR. JORDAN: As far as these guys who went out and coming back to you --

MR. CONWAY: No one said anything about the lights were out or anything like that.

MR. JORDAN: -- their access to and from to get this information, they didn't report anything to you about problems with lighting being out?

MR. CONWAY: No, they didn't.

MR. JORDAN: And the difficulty of transversing from one point to another?

MR. CONWAY: No, they didn't, not until the debriefing. It came out in the debriefing. Luckily everybody had their trusty flashlight though that we are not really required to carry but everybody does, at least the plant operators.

Most plant operators don't leave the control room without a flashlight or to go out in the plant so everybody had their flashlights.

MR. JORDAN: Okay.

MR. CONWAY: I don't know if I fully answered your question.

MR. JORDAN: You did. I was just curious.

MR. CONWAY: If it took longer we would to have come up with other contingencies and we were working on that. We were working on getting steam condensing available on RHR Alpha. That was going to be our secondary backup method, right, for if we couldn't tell what was going on in the main condenser and bypass valves.

MR. KAUFFMAN: Some plants aren't analyzed because of piping or whatever to use it, steam condensing mode.

MR. JORDAN: Have you ever used it?

MR. CONWAY: Yes. We used it during the startup and test program, I know that.

MR. JORDAN: Do you train on it?

MR. CONWAY: Yes. In the simulator we train on how to use that.

MR. JORDAN: Okay.

MR. CONWAY: So I think it would have taken a little bit longer to finally get to a stable, a more stable condition -- I don't want to say -- because it was stable during that time period anyway.

MR. JORDAN: But your main concern, you lost --

MR. CONWAY: As far having problems?

MR. JORDAN: You had eventually lost your heat sink and you recognized that so you are addressing the loss of heat?

MR. CONWAY: Alternate methods of heat sink.

MR. JORDAN: Of heat sink and as one of the concerns if this thing would have gone for a long period --

MR. CONWAY: We had to look at long term, right. We also had talked about making the high pressure core spray pump injection valves available and that was always available the whole time as a make-up source, high pressure make-up source.

We always had that available also. This was before, you know, we got control with the booster pumps and stuff, always had that available as an option for a make-up source so we had an option for heat sink and pressure control and an option for inventory make-up source.

MR. JORDAN: So what were we going to use for an option for pressure control?

MR. CONWAY: Steam condensing. Steam condensing does both.

MR. JORDAN: Does both.

MR. CONWAY: It will take steam off the reactor and condenses it and you can control your cool down rate on and off, just raise or lower level and that would have helped as our pressure control and ultimately the service water system is the heat sink.

MR. JORDAN: Okay. Any other things you have got as far as long term concerns? What you are saying is the communications, you circumvented that by sending people

running in and out, okay? And so that got to be less of a problem. It was a difficult problem but that was taken care of and I understand you were going to be using the RHR for the ultimate heat sink as well as pressure control and you are going to use HPCS or HPCI, HPCS I guess is what you have here --

MR. CONWAY: As a backup to RCIC.

MR. JORDAN: As a backup to RCIC once RCIC's pressure gets down too low or RCIC is no longer functioning.

Can you throttle the injection valve?

MR. CONWAY: We did not make it throttle-able. At the time we had discussed it, Mike Eron and I, had talked about that and Mark Davis that it was always available the whole time and we talked about it was always available. We could have started it and injected at any time --

MR. JORDAN: And you could throttle that valve?

MR. CONWAY: And we have a procedure in our EOP support procedure, the EOP-6, that allows us to make that, tells us how to make it throttle-able. We have to lift a lead out and a panel.

MR. JORDAN: Maybe you covered this also and I missed it.

Did the scenario of loss of annunciators and without the loss of your full core display -- have your people been trained on that?

MR. CONWAY: No. We have not. We have not trained on loss of annunciators.

MR. JORDAN: You lost a bunch of annunciators. Did you get any in?

MR. CONWAY: Yes. There were six alarms that were in and would not acknowledge. They were on the 601 panel, the 100 block, the first block there. There were four in a row and then the two below it were I think the 630, P-630, annunciator power supply failure -- I think that's what those read, those two, and the four directly above it which deal with service water were flashing and why those four above it came in I have no idea. I don't know how they related.

MR. JORDAN: And the two below? What do they mean?

MR. CONWAY: They mean that panel 630, one of our major annunciator panels down in the relay room, had lost power or they wouldn't acknowledge. We tried acknowledging them but they still wouldn't acknowledge and of course no audible alarm for them at all.

MR. JORDAN: Okay. As far as taking action outside of the EOPs, was there any actions that you took that says this -- or your procedures that you felt that in order to not do this you would just as soon not do it and chose not to do it?

Was there any actions that were required to be done by your EOPs or by your procedures that you had difficulty in doing? You said this procedure requires this but we are not quite in this condition and therefore we want to do this instead?

MR. CONWAY: No. I can't recall a single one.

MR. JORDAN: So you didn't have to use the 5054.X or anything else as far as your directing your people, that says, hey, I'm outside my tech specs --

MR. CONWAY: No. I guess the only thing that would have been along that line would have been get me the UPS's back. That was the direction I gave the operators I sent out. You know, once I got the report back that all the UPS's had tripped I sent Dave Hanczyk and a couple other guys out in the plant, you know, I need to get those UPS's back, do what you have to do.

That was the only other direction I gave that was not proceduralized per se. Everything else through the EOPs and our normal procedures that we were trying to parallel through the whole time. Everything worked well. You know, like the condensate booster pumps startup procedure complicated feedwater because we could not get that suction valves open and get flows through --

MR. JORDAN: You couldn't get the section valve open because of the --

MR. CONWAY: -- the DP on the valves.

MR. JORDAN: And you couldn't get the DP opened because of the fact that --

MR. CONWAY: One of the problems we had there --

MR. JORDAN: Why didn't go ahead and open them anyway?

MR. CONWAY: They tried that. They physically would not open but there is a large DP on it and those valves just don't operate against a large DP.

MR. JORDAN: They just wouldn't open.

MR. CONWAY: Correct. The other thing that probably complicated this was the fact that we lost the DRMS computer, which is like our rad monitoring computer and when we had these CAMs alarming we couldn't go to that and say, hey, here's what we really got -- we don't have anything else going on there, and they were the little portable ones out there, right, that they have out monitoring the building that were in alarm.

They probably went on rate of change because the rad levels changed or something. I never did get a report back why they were alarming but it was probably something simple -- all the rad levels dropped off.

MR. KAUFFMAN: Were there any places in the EOPs where the EOP put you in a loop and it was on something that maybe didn't seem important or good and you said, boy, the

EOP here has got me stuck and wasting my people and time on things that I could be better using elsewhere?

MR. CONWAY: The only time I felt even close to that was when I was in C-5 and I got the little override in RP that says the reactor's shutdown and no boron has been injected; start a cooldown.

Then there is also a precaution there that says if power starts to right or something, return it, B or something like that, and that brings you back in as a different form -- tells you to stop the cooldown, basically.

I read that and I wanted to apply it over here over on C-5 also but I couldn't because that particular permission was not given there. Because of that, you know, it didn't complicate things but that was the only time I felt that it would have been nice to have that over here too. I would have got out of C-5 and gone right into RL and normal water level control, but it didn't gain me anything and I didn't lose anything by doing that.

MR. JORDAN: The loop was the -- what was the loop? What was that? What was the restriction on C-5 that you were --

MR. CONWAY: It didn't give me the out I guess you could say, the permission to leave that, similar to the RP.

MR. JORDAN: I guess I don't understand what portion of it you were in that was difficulty. I mean

you're talking about rod control and we're talking about pressure. We're talking about level.

MR. CONWAY: Our C-5 is the power level control procedure.

MR. JORDAN: Okay.

MR. CONWAY: It gives me instructions on what I can use for injection, how I can inject, and what my band is.

MR. JORDAN: Okay.

MR. CONWAY: And once you get through the instructional type stuff you go down to the stop sign type device at the bottom and that basically says either all rods in or --

MR. JORDAN: All rods in? Is that what the loop was?

MR. CONWAY: That was down in there and that was what was keeping me in C-5. I knew I was already shut down and no boron had gone in and that was allowing me to cool down by RP but I still had to maintain a C-5 for level control purposes.

MR. JORDAN: And all rods in is what kept you in C-5?

MR. CONWAY: Correct.

MR. JORDAN: For level control.

MR. CONWAY: Correct.

MR. JORDAN: Even though you had your sufficient indication that the power was done --

MR. CONWAY: Correct.

MR. JORDAN: What you are saying is that you couldn't get out of C-5 because of --

MR. CONWAY: I'm saying that was the only thing that really boggled -- I don't want to say boggled me or it seemed -- I mean obviously if you are over in the RPB control ones those are formatted and you are very comfortable with that.

Here I am in a C-5 which we have routinely, you know always -- it seems like I always get the ATWS in training. I don't know why but it just seemed funny that that was not there and of course we have covered it in training before and there are purposes that you can cool down but in the event that you do start having a recovery of power because you are not fully shut down as you are cooling down you are already in C-5 and that can give you direction to lower level.

Now the leg of C-5 that I was in, of course, almost parallels with the exception of a few notes and restrictions and the systems you are allowed to inject with, the RL leg for the level condition I was at so there was no impact other than the fact that I felt more restricted because I couldn't use that in this case to get out of C-5.

MR. JORDAN: So there were systems but besides the fact of the no rods you felt there were systems you could use for injection that weren't allowed on -- I am trying to figure out what the restrictions were, the difference between two.

MR. CONWAY: The ones in C-5 are all the systems inject outside the shroud, so you always get pre-heating, RCIC, condensate feed water, CRD and boron, right?

MR. JORDAN: Okay.

MR. CONWAY: Whereas over in RL you can use those things plus it gives you HPCS and LPCS and all these other ones that of course are major distributors.

MR. JORDAN: Because you were in C-5 you were restricted? You couldn't use HPCS?

MR. CONWAY: Correct.

MR. JORDAN: Because you were in C-5.

MR. CONWAY: That's correct.

MR. JORDAN: You couldn't use LPCS, you were in C-5.

MR. CONWAY: Correct.

MR. JORDAN: Because they inject inside of the shroud, is that what it is?

MR. CONWAY: That's correct.

MR. JORDAN: Okay, and that's the restriction that you said because I've got these systems and I would like to

use them if I could and you were in a condition that you felt -- of course they were available the whole time anyway and ultimately if it became a problem you would end up using them anyway. It was by the way you routed around in C-5 --

MR. KAUFFMAN: I don't have any more.

MR. JORDAN: I don't have any more.

MR. KAUFFMAN: We would like to thank you for your time.

MR. CONWAY: Okay.

[Whereupon, at 2:05 p.m., the taking of the investigative interview was concluded.]

REPORTER'S CERTIFICATE

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission

in the matter of:

NAME OF PROCEEDING: Int. of MIKE CONWAY

DOCKET NUMBER:

PLACE OF PROCEEDING: Scriba, N.Y.

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Jon Hundley

JON HUNDLEY
Official Reporter
Ann Riley & Associates, Ltd.

07-1143-91

OFFICIAL TRANSCRIPT OF PROCEEDINGS

Agency: Nuclear Regulatory Commission
Incident Investigation Team

Title: Nine Mile Point Nuclear Power Plant
Interview of: MIKE CONWAY

Docket No.

LOCATION: Scriba, New York

DATE: August 17, 1991

PAGES: 1 - 77

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Exhibit 3-1 (continued)

ADDENDUM TO INTERVIEW OF MICHAEL S. CONWAY STAT. SHIFT SUPV.
(Name/Position)

Page	Line	Correction and Reason for Correction
6	11	EPR TO APRM : TERMINOLOGY CORRECTION
7	6	EPRM TO APRM : " "
10	21	STRIKE / REMOVE THE "I" : NOT RELEVANT & MAKES NO SENSE
12	1	CHANGE FLAT TO BLACK IE: NO POWER AVAIL/INDICATED
15	8	ADD 'IN' FOLLOWING FILTER : TO MAKE MORE SENSE
16	3	RCI TO RCIC : CORRECT TERMINOLOGY
16	13	RCI TO RCIC AND THAT IT "WAS" RUNNING, NOT WASN'T
17	2	CHANGE LB-10'S TO LV-10'S : TO CORRECT TERMINOLOGY
18	9	202.3 FROM 2023 : WHICH IS LISTED
20	7	SHIELD TO SEAL : CORRECT TERMINOLOGY
20	21	MBANS TO MAINTENANCE : CONTEXT REFERENCE
21	19	RAB TO ROD : CORRECT TERMINOLOGY
22	11	PUSHING TO PURSUING : TYPO
23	6	QUOTE : UNCERTAIN WHY THIS IS IN THAT LINE
24	13	ARCH OR TO RHR : CORRECT TERMINOLOGY
26	8	INC TO I&C : CORRECT TERMINOLOGY
26	12	INC TO I&C : " " "
26	17	RAD WASTE TO ROD WORTH : CORRECT TERMINOLOGY
27	15	RAB TO ROD : CORRECT TERMINOLOGY
28	14	RPB TO RPV 1 OF TO EOP : TERMINOLOGY CORRECTION
28	15	WOIGHT TO WAIT : PROP. TERMINOLOGY
31	8	RNC TO I&C : PROP. TERMINOLOGY
31	17	RFS TO RPS : " "
32	6	RFS TO RPS : " "
33	1	PLANNED TO POINTED : CONTEXT REFERENCE
36	14	S ET AL TO S @ ALL : PROPER TERMINOLOGY
36	19	AT COOL TO @ COOL : " " "
44	25	PRINTERS TO PRINT : CONTEXT REFERENCE
45	17	FINS TO FANS : CONTEXT REFERENCE
46	7	EPRMS TO APRMS : PROPER TERMINOLOGY
46	23	" " " "
52	2	AND I HAD TO AND ARI HAD COME IN : CONTEXT REFERENCE

Page 1 of 2 Signature _____ Date 10/2/91

ERRATA SHEET

ADDENDUM

Page	Line	Correction and Reason for Correction
55	15	MAB TO MANNING : CONTEXT REFERENCE
57	15	MODIFICATION TO MONITORING : CONTEXT REFERENCE
59	16	NON "LOP TO NON-LOT : CORRECT TERMINOLOGY
61	2	HILLIKER TO HELLER : CORRECT NAME
63	19	ADD "POWERS FROM" : ADD CLARIFY CONTEXT REFERENCE
73	8	MIGHT TO RISK : CONTEXT REFERENCE
74	21	ALL RODS IN TO ALL RODS NOT IN : CORRECT PROCEDURE STEP
75	1	BOWL TO DOWN : CONTEXT
75	8	RPB TO RPV : PROPER TERMINOLOGY

Date 10-7-91 Signature

PS 2 of 2

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

INCIDENT INVESTIGATION TEAM

- -

Interview of :

MIKE CONWAY :

(Closed) :

- -

Conference Room B
Administration Building
Nine Mile Point Nuclear
Power Plant, Unit Two
Lake Road
Scriba, New York 13093
Saturday, August 17, 1991

The interview commenced, pursuant to notice, at 12:12 p.m.

PRESENT FOR THE IIT:

John Kauffman, NRC

Mike Jordan, NRC

PROCEEDINGS

[12:12 p.m.]

MR. KAUFFMAN: Today's date is August 17, 1991. We're in the P building at Niagara Mohawk power unit number 2. My name is John Kauffman. I'll be leading the interview. I'm with NRC/AEOD.

MR. JORDAN: I'm Mike Jordan. I'm with the NRC, out of Region III. I'm a section chief.

MR. CONWAY: And I'm Mike Conway. I work for Niagara Mohawk. I'm a station shift supervisor.

MR. KAUFFMAN: Great. Now that we have the preliminaries out of the way, I'd just like to have Mike start off and tell us a little bit about his previous work history, background, education, number of years on the job, et cetera.

MR. CONWAY: Okay. Prior to working for Niagara Mohawk, I graduated from high school; I never went to college; I joined the Navy and became a Navy nuke. I spent six years in there, aboard submarines out of Charleston, South Carolina. Then I got hired by Niagara Mohawk.

When I first came to work here, I got hired as an auxiliary operator at Unit One. I was sent to license class and received a hot license, reactor operator, at Unit One, at which time there were several of us that did that, and then we were sent to Unit Two, which was in the construction

phase.

MR. KAUFFMAN: What year was it you were hired on as an aux operator?

MR. CONWAY: November, 1982.

MR. KAUFFMAN: When did you get your license?

MR. CONWAY: The first license -- I want to say that was February -- around that time -- early '84.

MR. KAUFFMAN: And then you stood shift --

MR. CONWAY: I didn't have any operating time. Basically, I believe, the company's philosophy at that time was to obtain a hot license on Unit One and then start learning Unit Two, which was in construction, because we had to obtain cold licenses, and they felt that that would give us a good basis and background for a cold license on Unit Two. It worked pretty well. I successfully passed a Unit Two cold license reactor operator exam.

MR. KAUFFMAN: When was that? Do you know? A long time ago?

MR. CONWAY: I don't remember the specific dates here, or time. That's on record someplace. I'm sure you can obtain that information.

I spent at least five years as a reactor operator at Unit Two, control room operator, plant operator. The way we work our shift program is, we rotate in plant and in control room for responsibilities.

Then, a year and a half ago, I was sent to senior reactor operator class, and last August I passed the exam. Prior to that, I was in the union. Once they send you to class and you get your SRO, they offer you a management position, and I was offered a station shift supervisor job and accepted and started December 1 of last year.

MR. KAUFFMAN: In the Navy, you were --

MR. CONWAY: Machinist's mate.

MR. KAUFFMAN: I'm just trying to establish background.

I guess the next thing we'd like to talk about is the August 13 event that you were station shift supervisor for, the plant conditions prior to the event and then what you saw and what you did.

MR. CONWAY: Okay. We were just finishing up a midnight shift. It was approximately 10 of 6 in the morning, and we had 100 percent power, preparing our shift turnovers. The work was done for that shift.

MR. KAUFFMAN: Can I interrupt?

MR. CONWAY: Sure.

MR. KAUFFMAN: One thing I haven't heard from anybody is the power history, how long the plant had been up and operating before this.

MR. CONWAY: It's funny you should say that, and it's one of those things we knock on wood when we say; we

kind of keep track of how long we've been on the grid and stuff like that. It had been about 121 days we had been operating, and of course, I knocked on wood after I said, Yes, 121st day, on the shift brief and stuff like that.

We were doing our turnovers, and I think Mike Eron, my assistant, was reviewing the shift checks. Most of the plant operators were getting ready for their turnovers. I was at my desk in the control room, and we heard a pop, kind of a popping sound. When I looked up from preparing my turnover, I noticed all the annunciators in the control room were out. They were not lit, any of the ones that were previously lit.

An eerie silence type thing. Normally you hear typers printing or the hum of fans blowing, power supplies, that type of thing. Everything went quiet. Of course, I ran out of the office and asked what happened, what's going on. It looked to me like some sort of a power failure. It was very hard to tell immediately. Obviously, when you lose all the annunciators, that's related to a power supply problem.

We immediately checked what power level and pressure were on the 603 panel, and the records had all stopped, and indicators had failed either up-scale or down-scale, some of them as-is.

One of the odd things about it was that the

instrumentation seemed to be not functioning, and the alarms didn't function at all, and all the computer CRTs went black, but we still had indications for all motors, the red-green lights, for valve positions, red-green lights -- we still had all those type of indications still available. Over on the electric plant boards, we still had a meter indication available for all power, for all our electric supplies to the different switch gears and stuff.

When I got the report that, we can't tell what power is because chart recorders had stopped, I yelled out, Somebody check the EPR meters in the back. I believe it was Mike Eron that went to the back, he and another operator -- I'm not sure which one; I want to say Dave Hanczyk, but I'm not sure.

While they went to the back, I immediately walked over to the 601 panel and looked at the PAM recorders, post-accident monitoring, and noted that they had tripped to fast speed. They normally run on slow but trip to fast speed when certain initiating conditions occur -- high reactor pressure or low water level in the vessel. They were running. Pressure was about 940, and vessel level was getting about 175, 180, in that range, and they were running at fast speed. It looked like a flat-line trace.

While I was there, I turned and looked at the 603 panel. I noticed that the recirc pumps had down-shifted to

low speed and that, on what we call the Rubik's Cubes, or the redundant reactivity control system, on 603, we had an indication of an ARI, alternate rod insertion, and a down-shift of the pumps.

At that time, I think, Mike Eron came up from the back panels and said the EPRMs are reading down-scale. He said, I recommend we place the mode switch to a shutdown. I said, I agree; some event's going on. I directed the CSO to place.the mode switch in shutdown.

At that time, people started performing their immediate actions for the prior procedures for a scram. During that time, I was also receiving reports. Somebody said, It looks like the feed pump has just tripped. At that time, I believe, I assigned one of the non-licensed operators, Eric Hoffman, to watch level and pressure on the 601 panel and keep me informed of the status, if you see any changes in the trends.

Then I turned around to our EOPs laying on top of the computer CRT in front of the 601 panel. I turned around to that, and I asked power, level and pressure. They gave me the readings, and I'd jot them down on the boards there, just as a formality, to try to focus on what I need to do next.

I got the report that the level was starting to slowly lower, so I ordered RCIC initiated, and I believe

Mark Davis started. He reported a problem -- it appeared after he initiated that the speed was oscillating, and he ended up having to take manual control. I was inquiring, Do we have injection flow yet, and he said, Not yet; it looks like one of the inboard check valves did not open. Then he said, Okay, now I have indication of flow.

Let's see. What happened next?

MR. KAUFFMAN: Did he put it in manual?

MR. CONWAY: He placed the speed controller in manual. It's a flow speed controller type arrangement, and he placed it in manual. That steadied the flow out. The speed, pressure, and flow were all oscillating around, and that stabilized RCIC at that time.

MR. KAUFFMAN: Then he got the injection valve.

MR. CONWAY: Well, the injection valve had opened, but we were waiting for the inboard check to swing open. I don't ever recall him saying that it did swing open, but it did show that we were getting injection flow and we had a slowly rising trend in level at that point.

Also, simultaneously with that, pressure slowly started coming down, because RCIC was spraying in on top of the steam bubble inside the core.

I guess, prior to RCIC restoring the level, the level dropped down to a low enough value, 159.3. I think I received a report from the operator that the level was now

down to 159, and at that time I entered the emergency operating procedures; that's one of our entry conditions.

I made that declaration to everybody in the control room, that we had entered those; again, received reports on where we were. Once I entered the EOPs, I followed down through the RQ leg, which is dealing with power. Pressure was fairly stable -- we didn't have a problem with that -- and level was still lowering, but we had RCIC injecting, and I was expecting it to turn, at which time it did slowly start turning it.

I was in the RQ leg. I realized at that time that one of the conditions to exit RQ if there was a non-scram condition is all rods into at least 0-2. I realized at that time that we could not tell what the position of the control rods were, because the full-core display had gone black. We couldn't tell from the rod worth minimizer or the rod sequence control where the rods were. When we tried to select rods, of course, we couldn't tell where they were, either, on the full rod display.

At that time, I made the declaration to everybody, Be aware that, since we can't tell where the control rods are at this time, we believe we've had a scram, but -- since we can't tell the position of the control rods -- we are still in the RQ leg is EOPs, and that I'm exiting RL leg, which is our normal water level control in EOPs, and going

to C5, which is power level control, our contingency EOP.

I believe then, once I was in C5, I directed the ADS inhibit switches to be placed in on; that's one of the steps that has to be performed. Then I assigned, I think, another operator to come in, Brian Hilliker, who had come in early -- he was just starting a day shift -- to take control of RCIC and gave him a water level band, I believe, of -- I want to say 170 to 190 on wide-range indication.

MR. JORDAN: Who was that?

MR. CONWAY: Brian Hilliker -- I believe he was the operator assigned RCIC control.

MR. JORDAN: And he was on the next shift?

MR. CONWAY: He is actually a relief shift person who was coming in to work days. He had come in a little bit early.

MR. JORDAN: Okay.

MR. CONWAY: I also directed actions per -- you know, following down the RQ leg, is ARI initiated? I asked that question, and that report was, Yes, it had. I dropped through, got down, turbine was off the line, dropped through, I MSIV still open, got down to another decision block, where we have to start implementing actions per our EOP 6, our support procedure for taking action to insert control rods. I think the oncoming day-shift CSO was in at that time, also, and I assigned him that responsibility --

that was Dave Rathbun -- to do EOP 6, attachment 14, to start working that and seeing what we can do to insert control rods. I told him, I know at this time we don't have any indication, but we need to start working on something.

Sometimes during this time period, our aux operators all started coming back from downstairs -- all the lights had gone out in the control building, where they do their turnover -- and they came all running back up the control room to find out what was going on.

MR. KAUFFMAN: When you say lights off in the control room, you mean all lights, part of the lights?

MR. CONWAY: In the control room we still had lighting. As far as which lighting went out, you'll have to ask those guys; they were out there. I can't specifically say.

MR. KAUFFMAN: So the report to you, you don't remember.

MR. CONWAY: They never said anything about the lighting; they just all came running in. They saw that we were in some sort of event, that I was implementing the EOPs. I directed, I think, Aaron Armstrong and a couple other guys to go down to the normal switchgear building and down to the UPS's and check out what was going on; there must be a problem down there. Those guys went running out.

Of course, during this time we didn't have our

Gaitronics available, either. We noticed that was flat. We wanted to make a station announcement, the reactor scram, call the troops. That wasn't possible.

Also, Al Denny, who was our shift emergency plan coordinator, approached me somewhere in this time frame and showed me his recommendation for classifying the event based on EAP-2. He recommended site area emergency, based on loss of control of annunciators and a transient in progress. As soon as I read that, I said, I concur. I made the announcement to the control room. That was like 6 o'clock.

MR. KAUFFMAN: This whole discussion here is all in about 10 minutes.

MR. CONWAY: All in about 10 minutes -- a lot of things going on at once.

I believe at that time Mike Eron says, I'll call Unit One and have them make the announcement, because we didn't have our Gaitronics available. He went into the clerk's office, I believe -- or he did it at the phone desk; I'm not sure where he did it, but he made the phone call to Unit One. We didn't hear the announcement, because, of course, our Gaitronics were out. I assumed that they had done that, because then people started taking actions accordingly.

Eventually -- I want to say from the time I entered the EOPs, which was, I want to say, three to five

minutes after the initial event occurred, through the next five minutes, we eventually turned level. I don't remember the lowest it goes; I want to say 140 was the lowest at that time, before level started turning and coming back up.

Meanwhile, pressure was starting to slowly decay off. It was down in the 800s at that time, as RCIC started turning levels. The level was coming up, and the pressure was slowly starting to come down.

MR. KAUFFMAN: Is that normal for the decay heat you had or after other scrams?

MR. CONWAY: Is that normal? I would say I would expect it to do that because RCIC was running; it uses steam from the vessel as motive steam, and it also sprays inside the core.

MR. KAUFFMAN: I'm really asking your plant-specific -- You know, at some plants you might expect that it won't bring pressure down, based on what people see after transients; and at some plants you might say, yes, it takes enough steam, and that brings it down.

MR. CONWAY: I expected this type of thing to happen, and of course I had continuous updates on what level and pressure were from Eric Hoffman. He was keeping me pretty well informed. Every minute, I've got to say, he was giving me an update on what was going on. I was becoming aware of the fact that level was going up, was rising, and

pressure was lowering. Since we were in RQ and C5, we could not commence a cool-down until we knew where our control rods were. I was being very conscious of that and starting to get worried. This seemed to be our only injection source.

At the time, it looked like pressure, level were under control. Power was less than 4 percent, so it looked like we weren't in an ATWS condition because of the way the plant was responding.

MR. KAUFFMAN: Can I interrupt with a question here real quick?

MR. CONWAY: Go ahead.

MR. KAUFFMAN: You said it was your only injection source. Did you not have CRD? Did something happen?

MR. CONWAY: CRD was also running.

MR. KAUFFMAN: Okay.

MR. CONWAY: I tend to overlook that as an injection source. It's a very small quantity.

MR. KAUFFMAN: Sure.

MR. CONWAY: Yes, it was running and injecting, I guess you could say, at that point.

MR. KAUFFMAN: Okay.

You recognized that the EOPs wouldn't let you cool down at the point I interrupted. It was your only source -- RCIC was --

MR. CONWAY: I was starting to inquire about those other sources. We knew that all the instrumentation -- I also inquired on the drywell parameters. I think I assigned one of the guys coming in to find out what drywell pressure is; I need to know what drywell pressure and a full set of drywell parameters. I think it was Jay Lawrence I asked; he was one of the oncoming shift personnel, also.

At this time, people were starting to filter, a few at a time, into the control room. As soon as people were coming in, I was directing them out. I sent one of the other non-LOPs out, for instance, to check down on the local instrument panels on the reactor building, 261. I asked him to check level and pressure at the instrument racks down there to confirm what our level and pressure -- that the instruments that we were reading were in fact accurate. I was fairly comfortable, because both PAM recorders were indicating the same, both Div 1 and Div 2. These instrument racks, of course, they are strictly analog indicators, direct hook to the vessel, and there is no way that these can be misleading me. Since there was no Gaitronics, he had to run all the way down and come all the way back with a report. And, yes, his report confirmed that level and pressure were where we thought.

Let's see.

Right now the level is rising, the pressure is

lowering. It's going to get concerned with cool-down.

I made that apparent to Brian Hilliker, who was controlling RCI -- Brian, watch our pressure, I don't want a cool-down, don't drop below 600 pounds I believe I told him. I think I wrote down EOPs maintain 500 to 600 or something like that. I may have given him that band. I don't remember. At that time I think was just making him aware that we're cooling down -- that we don't want to cool down, maintain it above 600 pounds.

Level was back up in the normal band, I want to say in the 180s, in that range, when it looked like we were going to have a problem with pressure, that it was going to start lowering, continue to lower because RCI wasn't running and injecting and I had him stop injection with RCI at that time.

Level continued to rise and pressure continued to lower, get down to about 590 pounds and I was getting pretty concerned. It looked like one time it had stabilized and that was only for it looked like a period of a minute and then the next report I got was that, yes, it's still lowering.

Then I became conscious of another problem. The booster pumps, booster pumps were still running and I was concerned that once we dropped below their shutoff head that I asked close -- you know, I'm worried about injection from

the booster pumps at this time. We don't want that to happen, let's close the LB-10s for the feed pumps and then the report back was I got that we can't, they are locked up, we don't have any power to them, at which time I said does it look like we may be injecting with the booster pumps and they said we don't know, we can't tell. The instruments aren't registering that, at which time I said, very well, secure the booster pumps. We don't want injection from that source and during that time it was reported that the level had gone above 202 on their wide range recorders, the PAM recorders. The pressure was down around I want to say 530 pounds. I'm not real specific on the pressure. If I had a flow chart in front of me I could tell you about where we were but it was in the 500 range and level had gone off our indicator at that time.

MR. KAUFFMAN: Quick question. Did you just think that the booster pumps injecting or was there some procedural guidance that led you to that?

MR. CONWAY: I was aware of the fact that the booster pumps could inject, especially if the LV-10s were open. That would have been the only flow restriction in their flow path and since they had several options closed the feed pump discharge valves, which take about -- well, it seems to me about five minutes a stroke -- I don't think they take quite that long, close the 21s which are the feed

header stops and the same type thing. They're long-winded valves so I felt that securing the booster pumps was the surest way to stop injection if there was any from the booster pumps and the way the level was rising I had to believe with RCI secured, you know, we are going to get a combination of the level swell from cool water injection and I was concerned that, yes, they were injecting.

So we have a procedure that says if we reach Level 8, which is 2023, and if we believe we have booster pump injection we're supposed to take action to prevent that from happening because they are worried about over-filling the vessel, flooding up to the steam lines and then taking away pressure control.

During this time bypass valves appeared to be controlling pressure stable. That's when it was maintaining it around 940 initially, then the report I got was we had half a bypass valve open and then it ended up dropping up to a quarter open and that was I think the last report I got on bypass valve position.

MR. KAUFFMAN: That was real early on.

MR. CONWAY: That was much earlier, yes.

That was back when I first entered EOPs. I dropped down through and found out what I am going to use for pressure control. It didn't look like -- you couldn't tell if any SRVs were cycled unless you were there when they

initially did. I guess we found out afterwards that two SRVs did actuate but initially at that time we did not know that.

I don't believe anybody saw that. I personally did not see any SRV actuation occur. Of course one of the key indicators of that is annunciation of the valve actuation and we didn't have that.

We were about I would say pretty close to 30 minutes into the event now and the pressure was starting to stabilize right around mid-500s or mid to low 500s. Level was offscale high. We couldn't tell where it was when suddenly annunciators started coming back on and meters started coming back on scale and chart recorders started running and I breathed a sigh of relief and said, all right, we'd got annunciators and instrumentation back.

I immediately asked for a report of level. I still had an indication that it was still upscale, greater than 202.3 and shortly within I've got to say two or three minutes after that, it started coming back on and I got the report of 198 inches and lowering.

I then told one of the other operators that was in the control room -- I want to say Jim Graff, who had come in -- he's also a relief operator, he'd come in early for days -- to start making preparations to restart the booster pump. I wanted to be able to have those as an injection source.

I had -- somebody reported condenser vacuum was 23 inches and it looked like it was slowly lowering and so we started making some plans at that time. More people had come in and we had -- I was working with Mark Davis to try to get a plan for him and Mike Eron what's going on here, and we talked about stuff like -- started getting aux boilers running so we can establish shield steam for the main condenser and utilize that as a primary heat sink.

Booster pumps of course, available so that we could have a reliable source of injection in addition to RCI.

What else? Work on getting the condenser removal pump started, the hoggers to work on our vacuum problem.

We talked about -- let's see, early on after I had ordered RCI started I also ordered suppression pool cooling on RHR alpha pump and so that was -- that was circulating.

We wanted to make plans to get RHR Bravo and Charlie, which were in an out of service condition. We had just marked them up to our maintenance earlier that shift si we had started taking action to get that back.

MR. JORDAN: Which one was on means?

MR. CONWAY: RHR Alpha -- or excuse me, RHR Bravo and Charlie. They were out of service ECCS pumps.

MR. KAUFFMAN: The work hadn't started. They were just more or less tagged out but --

MR. CONWAY: We had valves de-energized that we were going to do electrical PMs on and pump control switches were in pulled lock.

MR. KAUFFMAN: That's not on the floor. He could have gotten them back relatively easily by --

MR. CONWAY: All we knew is we sent people out and they cleared the tags on the valves, turned the breakers back on so they were on in fairly quick time.

What else were we doing? There was a lot going on at once. I remember I was giving updates, you know, during this time period to keep everybody informed of what was going on and where we were going, where we are now, here's what we're doing, control level and pressure.

One of our plans was to assign someone eventually to use the -- to the bypass valves but at this time we still didn't know -- well, wait a minute.

We got power back and we had -- I got the report. Finally, it took about ten minutes because we had to go around and check, using the Rad Select and between that and RSCS and we had to restart the rod drive control cabinet, and finally we got core scanned and we got the report that six -- we could not tell the position of six rods and I made that clear in my update.

MR. KAUFFMAN: You were the Emergency Director during all this time?

MR. CONWAY: Yes. One of the responsibilities of the shift Emergency Plan Coordinator, of course, is to assist me in implementing that duty. He makes -- he can make an initial recommendation on classification. He ensures all the notifications are make to outside agencies, for instance. That's part of his duty.

Also during the first few, I guess I'll say the first ten minutes Tom Tuttle, one of our STAs, had come in to relief Al Denny and I asked him if he would verify that we are doing everything we can do for loss of annunciators. This is prior to getting the power back so he was pursing looking at that. We have had a procedure for loss of all annunciators but nobody thought we'd ever use that.

He was looking at that.

MR. KAUFFMAN: Did you have any problems sounding the sirens or making announcements?

MR. CONWAY: Once we got power back to the UPS we immediately made a follow-up announcement to let everybody know what was going on.

We also started getting reports that -- from the guys we sent out into the turbine building to start working on getting the aux boilers back and starting up the condenser air removal pumps, that were CAM, Continuous Air Matters in alarm in the building and of course we reported that to Rad Protection immediately and we made an

announcement to stay clear of the turbine building and then worked with Rad Protection to get people in and out and they were doing surveys of both the reactor building and the turbine building to find out what levels were in there.

It turns out there was no problem at all. They were I guess, quote, since we were running all our people through them, when they had to go out of the building they were keeping track of who was going where and that kind of thing along with our CSO. Of course he was keeping --

MR. KAUFFMAN: Maybe I'm jumping ahead. What time did you get relieved as the Emergency Director? We're not, it's not our charter to look extensively at the emergency planning aspects but certainly we're interested in how you got around your communications and how all the people coming in and being sent out in the plant and this and that and the other got handled.

MR. CONWAY: I got relieved as Site Emergency Director at 7:38 by Marty McCormick.

MR. KAUFFMAN: Did you ever start getting help I guess from the TSC and OSC?

MR. CONWAY: I found out afterward, it seemed to take an awful long time to me to even get communications from them. It turned out that there was a little bit of a problem at Security in that I found our, afterwards of course, that there was a couple TSC staff members that they

weren't letting them through even though they had emergency-related functions. That was just a matter that they had new ID cards issued, emergency ID cards and I think the guards just were not familiar with the new format and once they got that cleared up, they were in.

They got staffed up and then of course it was matter with me becoming comfortable with having time to turn over and so it wasn't like as soon as they got in there I was going to give it to them. I wanted to make sure the plant was in a stable condition, we had a plan of action and that we had backup contingencies like steam condensing available with all those normally de-energized valves for Appendix R purposes turned back on and available on Arch or Alpha in the event that we lost -- we couldn't maintain vacuum in the condenser -- that was going to be our heat sink.

When it looked like pressure had stabilized, we had gotten power back to our UPS's and we had a booster pump running finally and they were having problems getting injection into the vessel. Its level was starting to slowly lower.

It turned out the problem, they were -- comes with our, I guess our procedure has a start to booster pumps. They were worried always about our feed pump seals and would like to protect them, had a lot of problems with them in the

past, and what we did to start the booster pump back up was to close the suction valves for the feed pumps. My intention of course was to use the LB-55s, which are the high pressure, low flow feedwater control valves as a method of injection control in the vessel.

They couldn't get the feed pump suctions, the MOV-84 valves open because of the DP across them. The feed pumps were locked in. Downstream the MOV was like 200 pounds and upstream was like 700 and that was too excessive a DP and at that time we were restricting access to the turbine building and hadn't worked our plan out with Rad Protection yet and we hadn't gotten the survey results back and we couldn't send anybody in to it, which is where the location of the bypass valve is, to equalize around them.

They were feeding on the low flow, low pressure valve, the LV-137 at full capacity and the level was still lowering.

Got down to -- I started asking, well, you know, we need to find out what we can do and I think I assigned another operator to assist him and Jim Graff into working out what we can do to get injection we need to get that available.

I think the lowest level it got was I ended up re-entering EOPs on low water level when we crossed 159 again and we -- at about 140 inches I am thinking, the core is

still covered but we need to start thinking about getting RCI running again and available for injection.

I was just getting ready to get that work when my reports were the level looks like it's stabilized and it was at 133 inches and the next report I got after that was level is now 134 and slowly rising and it rose real slow.

During this time period still hadn't -- we were trying to get INC people in through the TSC. They were still being kept out off-site, into the building and computer people into the building to get the process computer restarted, the rad waste SPDS computer back up, get the INC guys in to -- INC people in to work on getting our control rod indication back.

We weren't sure where the rods -- we were showing a blank display on our four rod display and you couldn't tell -- we weren't getting the red full in lights on the RSCS and the rad waste minimizer was giving us conflicting information. It said all but one were in and then it said they're all in and then it would go back to all but one and we were getting conflicting data so we were still under the assumption that all rods were not in and we were operating under that restriction.

I had given direction to Jim Graff to feed slowly based on the fact that all rods were not in. We didn't want to get power excursions.

I told Mark Bodoh, who was watching level on 603 to be conscious of reactor power and notify me if we have any increase in counts on our SRMs.

MR. JORDAN: What were you injecting with to turn the level? You got it down to 133 and then it started to come to 134.

MR. CONWAY: It was with the condensate booster pump through the low flow, low pressure valve which has a limited capacity. It's like a four inch line and I think we were getting between 400 and 600 gallons a minute and then we said he started a second condensate pump and that got a little bit more flow because it increased the discharge head of the booster pump.

So while were trying to work on getting people to get rad indication back, it looked levels started to turn. It was being taken in control but rising in a very slow rate. Pressure was still fairly stable and now starting to recover and come back up and slowly rise.

So we had pressure coming back up, level coming back up, pressure rose about 600 or 700 pounds I would lose my booster pump injection so I started thinking we need to stabilize pressure at this pressure range and I assigned that task to R. J. Reynolds on the turbine bypass valves. I said R. J., maintain 500 to 600 pounds; we are in an ATWS. We don't want to cool down. Be conscious that we don't have

vacuum stabilized yet. We don't have the hogger on. We don't have steam seals. We are working on getting the boiler and hoggers running but in the interim you need to be conscious of condenser vacuum so if you get -- if vacuum drops to 15 inches I want you to close turbine bypass valves to protect the condenser.

Let's see. We began cracking the bypass valve to stabilize pressure using the bypass opening jack and pressure at that time stabilized right in that range, around 550. That level was still slowly, real slowly rising. Of course he was bleeding a little steam off and we were limiting the injection so it was coming up real slow.

During that time period Mike Eron pointed out to me in the RPD control of the OP there is an override in one of the weight blocks, or stop sign shaped block that gives you the chance that it says if the reactor is shut down and no boron has been injected you can continue past that stop and commence a cooldown.

At that time I asked what power was, so when he said ten to the third on the SRMs I said okay, we are definitely below the heating range and we haven't injected boron -- we can begin a cooldown.

One of our ODIs gives us a little description that part of our departmental policy is we feel that we are shut down if we are less than the heating range on IRMs, which is

less than range 6 or 7.

MR. KAUFFMAN: Sounds like a conduct of ops procedure, something like that.

MR. CONWAY: It is Operation Department Instruction on EOP implementation, lessons learned from simulator runs.

MR. JORDAN: What point is that? What's the condition you consider shutdown?

MR. CONWAY: On IRMs, below the heating range, which is range 6 or 7.

MR. JORDAN: So below 6 or 7 on the IRMs --

MR. CONWAY: We're fairly confident that we are shut down.

MR. JORDAN: As long as you are below the heating range.

MR. CONWAY: Correct and it was reported to me that we were on SRMs, about ten to the third.

MR. KAUFFMAN: We are probably interested in seeing that procedure. Do you happen to know the number of it? No?

MR. CONWAY: I don't remember the number of it, not specifically.

It gives that kind of guidance in there though.

MR. KAUFFMAN: Okay.

MR. CONWAY: It's not specific but we have been

trained on saying, yes, we can say that. Same thing with one rod is out. We know that our shutdown margin test covers the fact that our most reactive rod is fully withdrawn so if we had all but one rod full then we know we could still say we're shut down, fairly confident.

So he pointed that out to me and at that time we still had to stay in the power level control because it doesn't give me an out until all rods indicate in, so we were still in there for level control and it gives me a pretty wide band, minus 14 to 202 I think is my band at that point and I gave them the band. I changed the level band with the booster starting, 165 to 180, so that we didn't refill too rapidly and I told him to feed slowing and he said he was feeding as fast as he could anyway. The level was still coming up slow.

At that point things were starting to shape up a lot better. We had a lot more people in. Jerry Helker was in. He's -- I was asking him for advice and between he, myself and Mike Eron and Al DeGracia, who is head of the Op Support Department for us -- he was in also.

We were formulating a plan to where we were going to go and what we were going to do next and since we were now able to cool down, we could start lowering our pressure band and enable conditions to even get better.

MR. KAUFFMAN: About what time was this?

MR. CONWAY: This was right around the time I got relieved by Martin McCormick of the TSC, so it was about 7:38.

It's written down here. Let's see -- 0630 I had all rods in except for six, the six control rods and 0700 we had finally got the indication that all rods were in and we had done stuff interim to that, trying to -- we hadn't gotten RNC techs in yet. We were working at EOP 6, Attachment 14, and one of the things we can do is reset the scram.

I think it was Dave Rathbun we felt that one of the reasons we may not have had indication of these rods is they may be over-driven in, and that by resetting the scram it may allow them to settle out to 00 and get an indication back so I said very well, let's take those actions.

Well, one of the things that we needed to do is then install the RFS jumpers. I said make it so, and he installed it. We reset the scram and we got our rod indication back at that point.

MR. JORDAN: And that is what you were looking for before you started cooling down, was the rod indication for the six rods?

MR. CONWAY: No. We didn't need that specifically because the RP leg says if you are shut down and no boron has been injected and the determination was mine that since

we were below the heating range on IRMs we were in fact shut down and that, you know, when I made that call and made the announcement that we were transitioning here to be conscious of power rising on SRMs, notify me immediately, I told Mark Bodoh, who was over on 603 panel.

Once we installed the RFS jumpers and reset the scram we did finally get an indication of all rods in and then it took a while for them to confirm that also, but they checked it on several sources and the rad waste minimizer was showing still one rod and we had full-in on full core display and full-in on RSCS but our rad waste minimizer was still in and out whether or not whether that rod was in or not.

We had it at least confirmed on two different indications.

In any case, one rod is definitely within our shutdown margin requirement.

Shortly after that, the process computer got restored; the computer techs came in and restored the process computer.

MR. JORDAN: So you're saying you started cooling down around 7; is that what you said? I was just curious.

MR. CONWAY: Specifics as far as time? I don't remember a specific time that I gave that. Let me think here a minute.

I remember Mike had planned that out to me, Mike Eron. I don't remember specifically when that was, time-wise. I know it was before we had all the rods indicating full in, though.

MR. JORDAN: Okay.

MR. CONWAY: And that was at 0700. It had to have been 6:30, after we got our power back to the UPS's, and 7:00, which is when all rods were indicated full in, except for -- yes, all rods were indicated full in at 0700.

MR. JORDAN: Okay.

MR. CONWAY: It had to have been fairly close to that time period, because we logged here we started the booster pump at 0640, and that was right after we had restored power. We had worked on getting that back; we had people out in the plant to do that.

We restored power to the UPS's at 0622.

Then, at 0738, I got relieved by Marty McCormick. I turned over to him where we were, what my intention were on what we do with the plant, and my feelings that things had stabilized fairly well and that I was interested in turning the site emergency directorate over to him. He said, Yes, he was ready, and we conducted a turnover over the phone. He relieved me of that function, and I made the announcement to everybody in the control room. We continued to cool down the plant.

You know, we placed RCIC in standby after making sure the booster pumps were running. We lowered our pressure band; we waited a full hour maintaining 500 to 600 pounds so we'd ensure we didn't exceed our cool-down rate. I think at quarter after 7 I lowered the pressure band 300 to 400 pounds.

Over the next couple hours, we just worked with getting things going. One of those things was trying to work with the OSC, ops support center, to get people in and out of the plant and get damage control teams out looking at UPS's. I discussed early with Marty McCormick about his interest in trying to get the UPS's back on their normal power supply and have the maintenance and DC available again as a backup. We formulated a plan, and we discussed this with Jerry Helker and Al de Gracia, Mike Eron -- the group of us in the control room, the senior management guys. We got together and came up with a plan of doing this, going from the Charlie and Delta, Bravo, Alpha, and Gulf, in that order, to minimize the possibility of losing one of them in the interim. We didn't know the status of the UPS's, other than that they were on a maintenance power. Doing the lighting ones first, Charlie and Delta were the minimum impact, other than that we would have lost half our Gaitronics system, our alarm announcement system, if one of them failed to transfer successfully. But we successfully

transferred all of them, except for the Alpha and Bravo, which were the major instrument bus suppliers.

My concern, of course, with those two was that at that time feedwater level control was in automatic on the LV-137, feeding with a booster pump, and the impact was that we could have lost that feedwater level control function. Everybody was aware of when we were doing that, and we were keeping TSC updated and posted.

Then we started shutting down our auxiliary systems, off-gas, steam generator-injectors. I got a report that the vent GEMs -- or, no, the stack GEMs -- had given us an alarm, saying it was inop, and we notified the dose assessment advisor, and he was going to get grab samples arranged for. We got results back.

MR. KAUFFMAN: Who is responsible for the samples?

MR. CONWAY: The chemistry department does it through the dose assessment advisor. They send out teams from the OSC to do that.

MR. JORDAN: Information like that gets fed through the control room, and then you feed it from the control room to the TSC; is that how that works?

MR. CONWAY: Correct.

MR. JORDAN: Okay.

MR. CONWAY: Of course, during this time, I was doing updates with Al Denny, the shift emergency plant

coordinator, 30-minute updates on where we were and where we were going, as far as further notification purposes.

Let's see. Did I forget anything?

We continued to shut down the auxiliary systems that we no longer needed that were part of the steam plant. During that time period where I was concerned about cooling down. I had ordered Jim Emery to work on using OP-101-Charlie, which is our shutdown procedure, to start closing off aux steam loads and steam drains to lower our pressure reduction. That helped stabilize things, too, finally, as far as pressure. That was back early on, though, before we got power restored.

Other things we did: We started our shift checks for -- we call them S et al., which covers all our different modes and assures we have the required instrumentation available to monitor the plant in all five modes of operation. It covers all those things. We started those to start checking our instruments.

Also, early on, it started the OSP-RCS at 001, which monitors your cool-down rate. Earlier on, we were concerned -- it was like shortly after we had declared the site area emergency, and I wanted somebody watching that specifically. I think it was Rich DeLong. He was watching that specifically and keeping me informed of what our rate was.

MR. JORDAN: He was monitoring the cool-down rate based on --

MR. CONWAY: He was using steam pressure and saturation tables to monitor the cool-down rate.

MR. JORDAN: Okay. That's what his function was, though.

MR. CONWAY: Yes.

MR. JORDAN: Okay.

MR. CONWAY: He ended up turning that over to somebody else, I believe, later on, but initially he was the one keeping track of that.

We also began restoring the things we had overridden -- ADS -- placed those back in normal -- ADS inhibits, which is back into normal -- and removed the RPS jumpers we had installed to reset the scram once we had risen above 159, the low scram setpoint, or reactor water scram setpoint.

During this time, Mike Eron was trying to get me to start a cool-down, and I was hesitant to do that, because my level was still low. I felt that, if I had started a cool-down and begun lowering, I was going to cook my level off, and then I would have less inventory. With lower pressure, granted, I might be able to get a little more injection flow, but I wanted to make sure level was back in a stable band. Once level got back up to 180 inches, I

directed the pressure band to be changed at that time -- that in conjunction with the time period that all this occurred. So like at quarter after 7, I said, Okay, we have water level now, and now we can lower our pressure band 300 to 400 at that time.

Eventually -- and it seemed like forever -- I got relieved.

MR. KAUFFMAN: What time was that?

MR. CONWAY: I want to say 11 o'clock, pretty close to 11 o'clock. I don't have the exact time written down in my log here, but right around 11 o'clock -- 10 of, something like that. We started a turnover. George Moyer was my relief.

MR. KAUFFMAN: You had an exciting morning.

MR. CONWAY: Yes. Then I went home and had a cocktail.

[Laughter.]

MR. KAUFFMAN: And had to get back in at midnight.

MR. CONWAY: That's right.

MR. KAUFFMAN: We won't get into how much shift work he's allowed to work.

[Laughter.]

MR. CONWAY: I met the requirement. You mean the eight hours off and all that?

MR. KAUFFMAN: Yes.

MR. CONWAY: I had the eight hours off. Is that what you mean by the shift work requirement? No more than 16 hours, eight hours on the panel.

MR. JORDAN: So, during your time up until 11 o'clock, was it the suction valves for the feedwater that were closed, so that you could not equal-pressurize around, so that you could get -- You were just using your -- You were feeding with your condensate booster through the --

MR. CONWAY: LV-137 valve.

MR. JORDAN: LV-137?

MR. CONWAY: That's correct.

MR. JORDAN: Okay.

So when you left, they were still feeding through LV-137? Was that the level?

MR. CONWAY: Startup valve, low-flow, low-pressure, feedwater control valve.

MR. JORDAN: Okay.

MR. CONWAY: I may have missed a few things here and there in my recollection of what happened, but a lot of things were happening at once.

MR. JORDAN: We're here for 10 days, trying to figure out what happened and reconstruct the event.

MR. CONWAY: I think the best reconstruction occurred at the initial debriefing, to tell you the truth, where we had everybody that was there inputting all the

information. That was all we did, and we ran it like our simulator critiques that we have at training. We don't tell people what we saw; we just ask -- what did you see, you know, and just poll everybody that was there. People supply everything. It pulls a picture together a lot better.

MR. KAUFFMAN: This question probably has been asked before, because Gene was here and it's Gene's favorite question: Were there any things that you would like to have had? Obviously, you'd like to have the UPS's.

MR. CONWAY: The UPS's would have been a nice thing to have back.

MR. KAUFFMAN: But do you have any ideas of things that could have made the response better or that you would like to have had that would have helped, or, for the things that you felt happened good, is there a reason that you think is important enough that everybody should have?

MR. CONWAY: The fact that we had a separation between normal instrumentation and, of course, divisional safety-related instrumentation was a major factor in helping figure out what we had now. When the event first occurred, we were scrambling to find out what we did have.

All our balance-of-plant equipment continued to run. The fact that we couldn't monitor it -- it still ran fine. That was, of course, a plus. We didn't have to deal with any major losses like loss of our condenser. That kind

of thing would have really complicated things. I mean, it would have made it more difficult to stabilize the plant, but it could have been done, in my opinion.

That, alone, helped us grasp control, to assess what we had, take the necessary actions initially, and grab control of what we had and stabilize the plant with the minimum number of people we had there, until we could get more people coming in. It worked.

RCIC worked. There were little problems with control. The oil has to heat up, and we don't run it routinely; quarterly is about all we ever run it.

Those kinds of things all help pull it all together to tie it up.

We had, still, all our drywell parameter indications available from the divisional meters. We knew there was no concern with the drywell. Although drywell temperature was starting to rise, one of the reports I got was that drywell unit coolers had tripped off. Mike Eron specifically brought that to my attention, that temperatures were rising, pressure was slowly rising. I think the pressure got to 0.7 psig, and the highest temperature was reported at 165 by Jay Lawrence. He said he had one at 165, one at 150, and the other four were at about the 130- to 140-degree range. I assessed that and felt that I didn't need to enter the primary containment EOPs. I knew that the

reason they were rising was that drywell cooling was off.

The fans had tripped. The cooling water valves were still lined up, which are primary containment isolation valves; they were still lined up. We didn't get an isolation. That would have been another thing. They come off another, separate UPS, the 3-series UPS, for all that primary containment logic and scram logic and all that. I'm thankful we didn't have a problem -- if primary containment had bottled up, with MSIVs shut, that would have pretty much sent us into using SRVs as pressure control and the suppression pool as our heat sink. That would have made things a little bit more difficult still, but I think we would have had it all under control eventually.

Other things that helped: having people knowledgeable enough to know how to re-energize the UPS's available at the time. That was a plus. There was a certain --

MR. KAUFFMAN: Is that normal, that people know how to do that, or was that some expertise that just happened to be there that day?

MR. CONWAY: I think there are enough people that know that, because of the way they have the shifts complemented out -- I want to say that the people of my vintage, for instance, we had some training on doing that because we were involved extensively in the start-up program

here. There were enough of us that were involved or working with marking these things up for maintenance that, I think, the diversification of enough people were on each shift that knew how to do it -- I guess I'm just pointing out that I was lucky enough to have one on my shift at the time.

MR. JORDAN: Do you know if it's the normal training program to have people know how to do that?

MR. CONWAY: I don't believe it is.

MR. JORDAN: In your normal routine, refresher training or anything like that, there's not a normal --

MR. CONWAY: We don't cover how to restore from a loss of all UPS, no. I mean, that's something you don't even conceive of happening.

MR. JORDAN: Okay.

MR. CONWAY: We talk about transfers back and forth, what causes them, that kind of thing, and how they work. Of course, that how-they-work type thing, coupled with the way the failure looked, we didn't observe it as a load problem, because all of them went. All but that one series -- every one of them -- had tripped. For that reason, we didn't feel it was a load problem; it was just a matter of getting the power back. Whether or not it was available was -- [Pause]

MR. JORDAN: I'm just curious about what parameters you were monitoring. You stated you had an

individual at the -- was it 603?

MR. CONWAY: The 601.

MR. JORDAN: The 601?

MR. CONWAY: Yes.

MR. JORDAN: -- that was looking at the level and pressure and maintaining the level with the RCIC.

MR. CONWAY: Correct.

MR. JORDAN: You mentioned you had somebody that at least -- You got reports back on a continuous basis; you said once every minute or some period of time.

MR. CONWAY: Three minutes, sure.

MR. JORDAN: Well, you felt comfortable knowing your knowledge of at least level and pressure. What other parameters did you have a feedback or a person that, while you were in the condition, for the 30 minutes or whatever --

MR. CONWAY: I was getting parameters on drywell, primary containment conditions --

MR. JORDAN: On a continuous basis?

MR. CONWAY: Not on a continuous basis. When I got the initial set of parameters for the containment, I felt that there was no cause for concern in the containment, other than the slowly rising temperature; we started taking action to correct that. Once we got power back, of course, I know Mike Eron was looking into the printers to try to

figure out how to get some jumpers in, to get the unit coolers back running, because ultimately we would have ended up in those.

We tried our LOCA bypass, which is our normal way of --

MR. JORDAN: Oh, they didn't come back on as soon as you got power back to them?

MR. CONWAY: When we got power back on, we then had power to allow the LOCA bypass switch relays -- the switch is actually relays to bypass the contacts. Those relays were de-energized when the UPS's went down, so, even with our LOCA bypass switches on, we could not restart the fans; the valves were fine, but we couldn't tell the fans, Hey, the valves are really open, because the relays wouldn't pick to allow that function to occur. Once we got the UPS's re-energized, it was just a matter of going back and restarting the fines to get drywell cooling restored, and that's exactly what we did.

MR. JORDAN: Did you have somebody go out locally to reset the relays?

MR. CONWAY: The control switches are on one of the panels in the back of the control room.

MR. JORDAN: Okay.

What other parameters did you have somebody stationed at to give you some type of a feedback? Level,

pressure, containment --

MR. CONWAY: After we got our power back to the UPS's, somebody was monitoring power at 603.

MR. JORDAN: Did you have somebody monitoring power before that?

MR. CONWAY: Prior to that, no. After the initial report Mike Eron gave us that EPRMs were down-scale -- I think Dave Hanczyk was back there with him, too -- Mark Davis, I think, was driving in detectors at that time. I think, as a matter of fact, Dave Hanczyk asked, Well, how are we going to know what power is if we're coming down? I said, Well, we can always look at the meters, the IRM meters on the back panels, on the drawers. He says, All right; I'll go check those. I know he went and looked at them -- I believe he did. I don't know specifically that he did. He never gave me a report back that he did, but Mark Davis was telling me that we had down-scale indications on IRMs when they would come in, so he was giving me feedback from that aspect -- that, yes, power was tracking down -- and then, when we got our front-panel meters restored, we got reports that we're on SRMs now and that they're trending down, also.

MR. JORDAN: I'm somewhat confused. You originally went back and looked at the EPRMs that were indicated down-scale, the LPRMs that were indicated down-scale, which indicated that the reactor power was down.

MR. CONWAY: Less than 4 percent, yes.

MR. JORDAN: Less than 4.

And that was early in the program.

MR. CONWAY: That was one of the first things we did.

MR. JORDAN: Okay.

MR. CONWAY: We knew where pressure was; we knew where level was; we needed to plan where power was.

MR. JORDAN: Okay. Then, from that time until you got power back, with your 601 panel -- is that what it is, the main panel? Is that 601 or 603?

MR. CONWAY: It's 603, where the full-core displays are.

MR. JORDAN: Okay, the 603 panel.

-- until you got power back to your NIs from the 603, who was doing what as far as power goes?

MR. CONWAY: I didn't assign somebody specifically to monitor power.

MR. JORDAN: Okay.

MR. CONWAY: I believe Mark Davis was doing that, when he could. I know he was driving in detectors, and I don't know if he was going back and checking it or not. I didn't get any further reports until after we got power restored, and that we were on SRMs.

MR. JORDAN: Okay.

MR. CONWAY: I believe he had driven the detectors in and he was ranging down on the range switches, because he had down-scale alarms in on that 603 panel. So I believe he was monitoring it, and I believe one time he also reported to me that IRMs down-scales are in, but, until the chart recorders got power back, we couldn't track them on the front panel, and I don't think he felt comfortable enough to leave the front to go to the back to check, but you can ask him.

MR. JORDAN: Okay.

MR. KAUFFMAN: I guess I have a couple more follow-up questions.

This one I brought with me from Washington, because of the 50.72 report that initially came in. It said that pressure control was lost at the start of the event, and I was wondering where that came from, if you guys said that or we got it wrong on our end or I have a misunderstanding.

MR. CONWAY: I have never said that, and up to this point I have never heard we had lost pressure control. I've got to believe that, based on the load reject that we took because of the main transformer fault, yes, in fact, pressure did go high enough to pick up two SRVs on pressure-relief function. If that constitutes loss of pressure control then that's why they said that, but I don't believe

at any time I had lost control of pressure, and I was taking actions, if I felt I was getting that way, to control it, and I did.

MR. KAUFFMAN: Who made the red phone calls here?

MR. CONWAY: Our communicator. Initially it's done from the control room by our rad waste operators, who are trained as communicators. Basically, they read the fact sheet that's prepared by our shift emergency plant coordinator and authorized by myself as the SED. They read that to the red phone line.

MR. KAUFFMAN: You don't recall signing anything like that.

MR. CONWAY: That might have come from the TSC, but no.

MR. KAUFFMAN: Okay.

MR. CONWAY: All we made mention of was loss of annunciators and that all rods weren't in and that kind of stuff. The rod position was unknown, and level and pressure were stabilized.

I'm not sure where that came from. That's interesting, though. I wouldn't even perceive it that way.

MR. KAUFFMAN: Ultimately I can go back to Washington, I guess, and if need comes up we can have them play the tape, because those are all taped.

This week has all been kind of hectic for me, too.

In fact, I had a good Tuesday. I was not working Tuesday. When I came in, I grabbed the reports that were there and talked to people about what happens. I may have, in haste, misread it, or it might not have been a report from when you were there. I don't recall the specifics of the 50.72 phone call.

MR. CONWAY: It was approximately three hours in, I believe, that TSC called over and had one of the -- I think it was, as a matter of fact, Tom Tuttle at the time -- asked him to check on a few indications. One of the things he was looking at was SRV temperatures. As soon as he read the recorder, he said he showed two that had spiked significantly higher than the rest, or showed two spikes, I should say. He said that may have indicated an SRV. He reported that to me, and I said, Well, keep the TSC informed and let them know what happened.

At that time, we suspected that those two had lifted, so we initiated our procedure for cycling our drywell vacuum breakers, which is supposed to be done within two hours. Of course, we didn't even think that we actually had an SRV. We had no way of telling that; no one had seen the valve actuate, as far as indication of the change. And our annunciation was lost. That first ten minutes was a lot of unknowns in there.

One of the things we didn't think to look at was

that recorder. There was no power to that recorder, anyway; it wouldn't have shown anything. At least I don't believe there was power to it. Obviously there was something, or the residuals were still there from when they opened, to show the spikes. I'm not sure.

MR. KAUFFMAN: I guess another question I had was what you've said and what we've heard from other places: that the RO recommended a scram, and I guess my basic question is just the background and what's the policy on when ROs initiate scram, when they recommend scram.

MR. CONWAY: Well, I had already come to that conclusion and was basically waiting to hear what power was.

MR. JORDAN: At your ASSS?

MR. CONWAY: That's correct.

MR. JORDAN: That's the assistant?

MR. CONWAY: The assistant station shift supervisor.

MR. JORDAN: Your assistant. Okay.

MR. CONWAY: He becomes the legal STA once we enter the emergency plan.

MR. JORDAN: All right.

MR. CONWAY: He had just come from the back panel. I was at the 601 panel, looking at the level and pressure. I recognized that some event had occurred, other than just the loss of the annunciators, and, when I had turned my head

to look at the 603 panel, on 602 recirc pumps had down-shifted and I had come in at that point. At that minute, he said, I recommend we scram. I said, I agree.

It's ultimately my call to direct that, unless one of the reactor operators -- or senior reactor operators, for that matter -- feels that conditions warrant that, and they don't need to wait to be told to do that.

MR. KAUFFMAN: My question was really, is it a requirement they do it? Is it a courtesy? Is it something that, if they're not really sure, they tell you what they think and let you make the decision?

MR. CONWAY: That's correct, and they're always told that: if they're not sure, they're supposed to raise that question, of course, to the SSS, and he makes that decision. That's why I get the big bucks, right?

MR. JORDAN: Right.

[Laughter.]

MR. KAUFFMAN: You got the big bucks for what happened on Tuesday.

MR. CONWAY: Right.

MR. KAUFFMAN: Another question I had is, I guess a lot of people eventually came up to the control room, and I guess the question of crowd control and how you maintain control of the people and how you got them to do what you wanted without losing control of them and having all those

people running around doing things you didn't want to do -- just how you handled that whole thing.

MR. CONWAY: Congestion in the control room -- it started building a couple times. What I did is, I just grabbed the first person I saw, and I would say, Clear everybody out of here that isn't actively doing something right now. The control room is getting very congested and noisy. I could have yelled out, Hey, everybody shut; anybody that doesn't belong here, get out of here. But I know Mark Davis had assigned people to do certain functions, as to the CSO, because I had given him tasks to perform. Rather than just clear everybody out and then find that those people were actually doing something over here, I wanted to let this person -- I had to do that twice, and the person that I did assign that to, they would walk; they would ask somebody, Do you have business here, or are you just hanging -- because that's our assembly area, also, and that promotes that congestion. If they said no, then they were asked to move someplace else in the control room; the noise was becoming a bit much, and the congestion.

That's how I ended up clearing the control room twice.

MR. KAUFFMAN: It was really two parts. It's how just basically you can manage it, how you control the crowd and then to some degree how you kept track of what

everybody was doing and --

MR. CONWAY: Through Mark Davis -- I would continually check with him on what's the progress on the board, the hoggers, who's working on it, you know, and he would say so-and-so is working on that, so-and-so on this, this and that. He knew who was doing what where and of course the people in the control room that I had assigned positions I kept aware of them.

You know, like I assigned one of the other CSOs they had coming in the duty of following along with what we are doing here and OP-101-C, our shutdown procedure, and verify, try to parallel it and confirm and one of the things he pointed out was our cooldown rate is limited from normal temperature down to 450 degrees because they're worried about crudburst and complicated chemistry controlling the core and he pointed that out to me after I had R.J. Reynolds, who was controlling pressure and at that point we had started a cooldown rate that I told him 100 degrees an hour was his rate and don't exceed that. He had just -- I don't think he had even started yet. He was still in the pressure stabilization type process when Bob Spooner had pointed that out to me, that 25 is the limit and then of course at that time I corrected, made the correction to my order to limit down to 25 down to 450.

MR. KAUFFMAN: If the people in the plant ran into

problems or had questions they were dealing with the CSO?

MR. CONWAY: Yes, unless there was something that they felt needed to be brought specifically to my attention or Mark would bring them over to me and say this and this and this and we would make the necessary decisions.

A lot of them were done as a group like that. We would get together and talk as a group -- here's what our plan, here's how we're going. We've got a lot of contingency backup in case this fails or this fails. We look like we are in good shape here.

MR. KAUFFMAN: Can you recall any problems that the people out in the plant had that needed to be brought up and resolved?

MR. CONWAY: One of the those problems was after the TSC got mad and the OSC everything had to go through the OSC as far as for accountability process, right?

That as far as I am concerned bottlenecked our recovery. I mean it slowed it right down because we had to physically at first send people over to the OSC, which is at Unit One and then they would be dispatched as part of a damage control team out to the plant, which later on we got them to change that into just notifying them who was going out and where but initially that's how they were running it. Boy, that slowed it down a lot!

MR. JORDAN: How did you communicate with the OSC

in Unit One?

MR. CONWAY: Through our communicator. Gus had a phone number we could dial. We found out what the phone number was.

MR. JORDAN: Was communications available? I mean was --

MR. CONWAY: We don't have a direct line to the OSC. To the TSC we do and basically we would tell people, you know, the TSC, that we are sending people out to go do this and then they would notify the OSC and then the OSC would call and say, hey, you need to send them over here. We'd say "Aw-w-w."

MR. JORDAN: How about just normal communications. I mean you'd use the telephone, okay. Is that because the communications was lost or that is the normal method you would have done it like to the TSC or the OSC?

MR. CONWAY: TSC is done by phone.

MR. JORDAN: Okay, how about the OSC?

MR. CONWAY: OSC we do not have a dedicated line for that but of course any phone in the control room could have called them.

MR. JORDAN: So that is how your normal communications --

MR. CONWAY: With the OSC.

MR. JORDAN: If you hadn't lost your power

supplies, okay, you would still have had the problem with the communications that you had with the TSC -- not the TSC but the OSC.

MR. CONWAY: I don't know if I would call it a problem, other than the fact that it was more of a procedural type thing.

MR. JORDAN: Okay.

MR. CONWAY: Right? They were saying, oh, you've got to come over here to do it. It wasn't really a communication type thing.

MR. JORDAN: Okay.

MR. CONWAY: Initially the only communication problems were okay, we couldn't make an announcement to everybody on the site, in the Two site, right?

Unit One had to make that call and the Gaitronics merge when either stations makes, sounds one of the station alarms -- the fire alarm, the station alarm or the evacuation alarm, both systems merge and the announcements are heard at both stations simultaneously, but we lost our Gaitronics and so their station announcement -- they heard it at their station but nobody at our station did.

MR. KAUFFMAN: Was there some kind of a contingency or backup to deal with that?

MR. CONWAY: Not that I am aware of.

I was asked to speculate on that the other day and

my answer to that was I would have probably contacted security and had them dispatched to various locations of the plant and make sure people were kept informed that they were supposed to be at their assembly areas.

Of course there were very few people on site at that time anywhere so when Security was notified that that was occurring they stopped everybody from coming in and that helped for accountability purposes and notification of people.

The Gaitronics of course -- one half is powered off of one UPS and the other half is powered off the other UPS and then our radio system, Leaky Wire, is powered off a third UPS, so chances of losing all three simultaneously were pretty --

MR. JORDAN: -- remote but it happened.

MR. CONWAY: -- remote but it happened, yes.

MR. JORDAN: So you don't know when you notified Unit One to notify the plant whether or not that notification actually went into Unit Two or not? Or you do know?

MR. CONWAY: We did not hear any announcement over the Gaitronics in the control room, let me put it that way, and we would have heard it -- we routinely hear it every Friday they test their station alarms and we test ours.

MR. JORDAN: Okay.

MR. CONWAY: And we usually hear theirs in the control room and I didn't hear it, so I've got to believe it did not go out.

MR. KAUFFMAN: I've got some more good questions here.

One of the questions I have was as the UPS's got re-powered and started getting their annunciators back, how did you go about I guess looking at them and figuring out if there are more problems. How did you just handle the situation of the alarms coming back.

MR. CONWAY: The people on those boards handled it.

For instance, Brian Hilliker was assigned a 601 panel. He was over there running RCI and then I had him relieve Eric Hoffman for moderating level and pressure because he is a reactor operator and Eric was just non-LOP initially. He was all I had so I stationed him there. I wanted my ROs doing other things.

He responded accordingly by the procedure to the alarms that were in. If he felt that something needed to be brought to my attention he was going to do that.

I did not give any specific directions on, you know, if there are any abnormal alarms, let me know. Everybody knows. If it's abnormal, they're going to let me know. They have to. The procedure will even say notify the

SSS right in it and so as the alarms came back in, of course some of them were fast flash, some slow flash, which means the condition had been an alarm and cleared, they would have kept me notified.

I didn't get any notification of anything abnormal from annunciators that were received or cleared, that I recall.

MR. KAUFFMAN: I guess these two are kind of tied together here. It just occurred to me now and it might have been a good thing to write them all down since -- I guess the printer and stuff wasn't working then but --

MR. CONWAY: Oh, I see, yes. Hindsight.

MR. KAUFFMAN: It just occurred to me too, but that's like one of our assistant SSS's was -- he had gotten there early also and he was walking around with a pad of paper, keeping a rough log of what was going on.

MR. KAUFFMAN: That was my next question --

MR. CONWAY: When I saw this log --

MR. KAUFFMAN: That's where a lot of this information came from. No offense to -- I guess it is your writing in here early on --

MR. CONWAY: This is me, yes!

MR. KAUFFMAN: It's kind of sloppy and then when the event happened it gets neat and --

MR. CONWAY: What we did was, this log was

generated from I've got to say three sets of notes, one that was kept by Jerry Hilliker, who had come in after the event had occurred. I am not sure specifically what time he came in.

He and I together worked out the site emergency director checklist to make sure we were doing everything we had to do prior to being relieved by the TSC.

Don Bosnick, who was the Assistant SSS that was oncoming, who had come in early to start a turnover, he had kept some notes, and then Mike Garbus, who is one of our CSOs on relief shift who had also started keeping a rough log from approximately seven o'clock on when he came in.

In between all those three notes, basically between Mike Eron, Mark Davis and myself, we read through what they had written down and filled in blanks where they weren't sure of what was going on when and then I told Don, put in a log, Don, and that is where this log came from.

So it is not like we were writing during the whole thing. I personally -- the only place I was writing was on the EOP boards. That's where I was doing my writing.

MR. KAUFFMAN: We would be asking other questions I think if the reactor melted but you kept a really good log!

[Laughter.]

MR. KAUFFMAN: So -- this is kind of an EP

question again that just occurred to me. Do you know what you would do if say you hadn't restored the UPS's and the TSC is now up and activated, right, and they want information on point parameters and this, that and the other and your SPDS is down, your computer is down -- well, I'm guessing. I would guess in the E-Plan there is some way to get information to the other emergency response facilities that need if the primary means are down.

MR. CONWAY: The communicator, the communications aide who is in the control room, of course is in direct communication with the TSC the whole time and with the communicator on the other end and they have I believe a data sheet they ask for parameters for and basically he would say ask me or someone else -- I think Don Bosnick who as a matter of fact was taking care of a lot of that because I wasn't aware of them asking for anything --

MR. KAUFFMAN: What about the old paper method?

MR. CONWAY: Basically the paper method, yes. They had a checksheet and for different parameters and they would have asked for those and if we had the instrumentation available we would have given them what they wanted. If not, then it would have been sorry, not available or we would have tried to figure out how to get that information for them, if it was important.

You would be reading it to them and they would

have a similar sheet on the other end of the phone and writing it all down and that's how they would get it.

MR. KAUFFMAN: I used to run drills. We'd break these sort of things to force the communications channels because that is a real good way to check the effectiveness of the communications in the organization if you are a drill controller is to interject something and see how long it takes to come out the other end.

MR. CONWAY: There is also another method. Of course they have the remote video camera that is controlled from the TSC.

MR. KAUFFMAN: Oh, I didn't see those up there.

MR. CONWAY: It's in the control room and I don't know when they pull the lens cap off but of course from that they can -- zoom in, zoom out and they can get a lot of the front panel information themselves. They can watch me pull my hair out, do anything they want, so that was available as another information-gathering device.

MR. KAUFFMAN: Where is that --

MR. CONWAY: I have no idea.

MR. KAUFFMAN: That's a rhetorical question.

MR. CONWAY: I understand. That didn't need an answer, eh?

MR. KAUFFMAN: Well, let's see. Anything on my list that we didn't cover? We might let Mike talk about

this one.

MR. JORDAN: Maybe we've already explored this and I have missed the concern, and that's if you didn't get the UPS back in a half an hour and it would have continued to be out, what was the major problems that you had? I mean you're into this thing half an hour and the adrenalin now is down to the point where you are doing something that is pretty stable, hopefully stable. What were your major problems that you had as far as if this thing went on for a long period of time that you had to overcome?

MR. CONWAY: The level was fairly well under control. The pressure was under control. Establishing a permanent form of heat sink would have been difficult. For instance, no vacuum indication would have been -- they had no idea what was going on in condenser vacuum and that was another thing I did. Somebody said, well, we don't know what the condenser vacuum is doing right now and we had half, that was when we had half a bypass valve open, right, so I'm like -- yeah, we better send somebody out to look at that, so I dispatched a non-LOP -- well, actually I think I told Jim Graff send somebody out to check condenser vacuum locally and get back to us on what we have.

MR. JORDAN: And did they do that?

MR. CONWAY: Because Gaitronics was down, the Leaky Wire system is down, they had to go out to the plant

and then get their reading and then come back to the control room.

MR. JORDAN: Did they have problems in doing that? Do you know?

MR. CONWAY: Did they?

MR. JORDAN: Yes.

MR. CONWAY: I didn't receive a report that there was difficulty doing it other than they were breathing hard when they got back.

I think that may have been the guy that reported the CAMs were alarming out in the turbine building, you know, and of course one of his responsibilities is to see if it is reading anything and get out of the area.

MR. JORDAN: Okay. We had some indication there were some lighting problems and I think you alluded to it earlier, that there was some lighting problems.

MR. CONWAY: I wasn't aware of any in the control room.

MR. JORDAN: As far as the control room lighting you noticed no degradation of the lighting system?

MR. CONWAY: I don't recall ever noticing it.

MR. JORDAN: Do you know what kind of lighting problems they had out in the plant?

MR. CONWAY: I understand that --

MR. JORDAN: What reports did you get?

MR. CONWAY: -- that control building lighting was out. I didn't receive any reports during it. Afterwards, in the debriefing it came out that lighting was out.

MR. JORDAN: As far as these guys who went out and coming back to you --

MR. CONWAY: No one said anything about the lights were out or anything like that.

MR. JORDAN: -- their access to and from to get this information, they didn't report anything to you about problems with lighting being out?

MR. CONWAY: No, they didn't.

MR. JORDAN: And the difficulty of transversing from one point to another?

MR. CONWAY: No, they didn't, not until the debriefing. It came out in the debriefing. Luckily everybody had their trusty flashlight though that we are not really required to carry but everybody does, at least the plant operators.

Most plant operators don't leave the control room without a flashlight or to go out in the plant so everybody had their flashlights.

MR. JORDAN: Okay.

MR. CONWAY: I don't know if I fully answered your question.

MR. JORDAN: You did. I was just curious.

MR. CONWAY: If it took longer we would to have come up with other contingencies and we were working on that. We were working on getting steam condensing available on RHR Alpha. That was going to be our secondary backup method, right, for if we couldn't tell what was going on in the main condenser and bypass valves.

MR. KAUFFMAN: Some plants aren't analyzed because of piping or whatever to use it, steam condensing mode.

MR. JORDAN: Have you ever used it?

MR. CONWAY: Yes. We used it during the startup and test program, I know that.

MR. JORDAN: Do you train on it?

MR. CONWAY: Yes. In the simulator we train on how to use that.

MR. JORDAN: Okay.

MR. CONWAY: So I think it would have taken a little bit longer to finally get to a stable, a more stable condition -- I don't want to say -- because it was stable during that time period anyway.

MR. JORDAN: But your main concern, you lost --

MR. CONWAY: As far having problems?

MR. JORDAN: You had eventually lost your heat sink and you recognized that so you are addressing the loss of heat?

MR. CONWAY: Alternate methods of heat sink.

MR. JORDAN: Of heat sink and as one of the concerns if this thing would have gone for a long period --

MR. CONWAY: We had to look at long term, right. We also had talked about making the high pressure core spray pump injection valves available and that was always available the whole time as a make-up source, high pressure make-up source.

We always had that available also. This was before, you know, we got control with the booster pumps and stuff, always had that available as an option for a make-up source so we had an option for heat sink and pressure control and an option for inventory make-up source.

MR. JORDAN: So what were we going to use for an option for pressure control?

MR. CONWAY: Steam condensing. Steam condensing does both.

MR. JORDAN: Does both.

MR. CONWAY: It will take steam off the reactor and condenses it and you can control your cool down rate on and off, just raise or lower level and that would have helped as our pressure control and ultimately the service water system is the heat sink.

MR. JORDAN: Okay. Any other things you have got as far as long term concerns? What you are saying is the communications, you circumvented that by sending people

running in and out, okay? And so that got to be less of a problem. It was a difficult problem but that was taken care of and I understand you were going to be using the RHR for the ultimate heat sink as well as pressure control and you are going to use HPCS or HPCI, HPCS I guess is what you have here --

MR. CONWAY: As a backup to RCIC.

MR. JORDAN: As a backup to RCIC once RCIC's pressure gets down too low or RCIC is no longer functioning.

Can you throttle the injection valve?

MR. CONWAY: We did not make it throttle-able. At the time we had discussed it, Mike Eron and I, had talked about that and Mark Davis that it was always available the whole time and we talked about it was always available. We could have started it and injected at any time --

MR. JORDAN: And you could throttle that valve?

MR. CONWAY: And we have a procedure in our EOP support procedure, the EOP-6, that allows us to make that, tells us how to make it throttle-able. We have to lift a lead out and a panel.

MR. JORDAN: Maybe you covered this also and I missed it.

Did the scenario of loss of annunciators and without the loss of your full core display -- have your people been trained on that?

MR. CONWAY: No. We have not. We have not trained on loss of annunciators.

MR. JORDAN: You lost a bunch of annunciators. Did you get any in?

MR. CONWAY: Yes. There were six alarms that were in and would not acknowledge. They were on the 601 panel, the 100 block, the first block there. There were four in a row and then the two below it were I think the 630, P-630, annunciator power supply failure -- I think that's what those read, those two, and the four directly above it which deal with service water were flashing and why those four above it came in I have no idea. I don't know how they related.

MR. JORDAN: And the two below? What do they mean?

MR. CONWAY: They mean that panel 630, one of our major annunciator panels down in the relay room, had lost power or they wouldn't acknowledge. We tried acknowledging them but they still wouldn't acknowledge and of course no audible alarm for them at all.

MR. JORDAN: Okay. As far as taking action outside of the EOPs, was there any actions that you took that says this -- or your procedures that you felt that in order to not do this you would just as soon not do it and chose not to do it?

Was there any actions that were required to be done by your EOPs or by your procedures that you had difficulty in doing? You said this procedure requires this but we are not quite in this condition and therefore we want to do this instead?

MR. CONWAY: No. I can't recall a single one.

MR. JORDAN: So you didn't have to use the 5054.X or anything else as far as your directing your people, that says, hey, I'm outside my tech specs --

MR. CONWAY: No. I guess the only thing that would have been along that line would have been get me the UPS's back. That was the direction I gave the operators I sent out. You know, once I got the report back that all the UPS's had tripped I sent Dave Hanczyk and a couple other guys out in the plant, you know, I need to get those UPS's back, do what you have to do.

That was the only other direction I gave that was not proceduralized per se. Everything else through the EOPs and our normal procedures that we were trying to parallel through the whole time. Everything worked well. You know, like the condensate booster pumps startup procedure complicated feedwater because we could not get that suction valves open and get flows through --

MR. JORDAN: You couldn't get the section valve open because of the --

MR. CONWAY: -- the DP on the valves.

MR. JORDAN: And you couldn't get the DP opened because of the fact that --

MR. CONWAY: One of the problems we had there --

MR. JORDAN: Why didn't go ahead and open them anyway?

MR. CONWAY: They tried that. They physically would not open but there is a large DP on it and those valves just don't operate against a large DP.

MR. JORDAN: They just wouldn't open.

MR. CONWAY: Correct. The other thing that probably complicated this was the fact that we lost the DRMS computer, which is like our rad monitoring computer and when we had these CAMs alarming we couldn't go to that and say, hey, here's what we really got -- we don't have anything else going on there, and they were the little portable ones out there, right, that they have out monitoring the building that were in alarm.

They probably went on rate of change because the rad levels changed or something. I never did get a report back why they were alarming but it was probably something simple -- all the rad levels dropped off.

MR. KAUFFMAN: Were there any places in the EOPs where the EOP put you in a loop and it was on something that maybe didn't seem important or good and you said, boy, the

EOP here has got me stuck and wasting my people and time on things that I could be better using elsewhere?

MR. CONWAY: The only time I felt even close to that was when I was in C-5 and I got the little override in RP that says the reactor's shutdown and no boron has been injected; start a cooldown.

Then there is also a precaution there that says if power starts to right or something, return it, B or something like that, and that brings you back in as a different form -- tells you to stop the cooldown, basically.

I read that and I wanted to apply it over here over on C-5 also but I couldn't because that particular permission was not given there. Because of that, you know, it didn't complicate things but that was the only time I felt that it would have been nice to have that over here too. I would have got out of C-5 and gone right into RL and normal water level control, but it didn't gain me anything and I didn't lose anything by doing that.

MR. JORDAN: The loop was the -- what was the loop? What was that? What was the restriction on C-5 that you were --

MR. CONWAY: It didn't give me the out I guess you could say, the permission to leave that, similar to the RP.

MR. JORDAN: I guess I don't understand what portion of it you were in that was difficulty. I mean

you're talking about rod control and we're talking about pressure. We're talking about level.

MR. CONWAY: Our C-5 is the power level control procedure.

MR. JORDAN: Okay.

MR. CONWAY: It gives me instructions on what I can use for injection, how I can inject, and what my band is.

MR. JORDAN: Okay.

MR. CONWAY: And once you get through the instructional type stuff you go down to the stop sign type device at the bottom and that basically says either all rods in or --

MR. JORDAN: All rods in? Is that what the loop was?

MR. CONWAY: That was down in there and that was what was keeping me in C-5. I knew I was already shut down and no boron had gone in and that was allowing me to cool down by RP but I still had to maintain a C-5 for level control purposes.

MR. JORDAN: And all rods in is what kept you in C-5?

MR. CONWAY: Correct.

MR. JORDAN: For level control.

MR. CONWAY: Correct.

MR. JORDAN: Even though you had your sufficient indication that the power was done --

MR. CONWAY: Correct.

MR. JORDAN: What you are saying is that you couldn't get out of C-5 because of --

MR. CONWAY: I'm saying that was the only thing that really boggled -- I don't want to say boggled me or it seemed -- I mean obviously if you are over in the RPB control ones those are formatted and you are very comfortable with that.

Here I am in a C-5 which we have routinely, you know always -- it seems like I always get the ATWS in training. I don't know why but it just seemed funny that that was not there and of course we have covered it in training before and there are purposes that you can cool down but in the event that you do start having a recovery of power because you are not fully shut down as you are cooling down you are already in C-5 and that can give you direction to lower level.

Now the leg of C-5 that I was in, of course, almost parallels with the exception of a few notes and restrictions and the systems you are allowed to inject with, the RL leg for the level condition I was at so there was no impact other than the fact that I felt more restricted because I couldn't use that in this case to get out of C-5.

MR. JORDAN: So there were systems but besides the fact of the no rods you felt there were systems you could use for injection that weren't allowed on -- I am trying to figure out what the restrictions were, the difference between two.

MR. CONWAY: The ones in C-5 are all the systems inject outside the shroud, so you always get pre-heating, RCIC, condensate feed water, CRD and boron, right?

MR. JORDAN: Okay.

MR. CONWAY: Whereas over in RL you can use those things plus it gives you HPCS and LPCS and all these other ones that of course are major distributors.

MR. JORDAN: Because you were in C-5 you were restricted? You couldn't use HPCS?

MR. CONWAY: Correct.

MR. JORDAN: Because you were in C-5.

MR. CONWAY: That's correct.

MR. JORDAN: You couldn't use LPCS, you were in C-5.

MR. CONWAY: Correct.

MR. JORDAN: Because they inject inside of the shroud, is that what it is?

MR. CONWAY: That's correct.

MR. JORDAN: Okay, and that's the restriction that you said because I've got these systems and I would like to

use them if I could and you were in a condition that you felt -- of course they were available the whole time anyway and ultimately if it became a problem you would end up using them anyway. It was by the way you routed around in C-5 --

MR. KAUFFMAN: I don't have any more.

MR. JORDAN: I don't have any more.

MR. KAUFFMAN: We would like to thank you for your time.

MR. CONWAY: Okay.

[Whereupon, at 2:05 p.m., the taking of the investigative interview was concluded.]

REPORTER'S CERTIFICATE

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission

in the matter of:

NAME OF PROCEEDING: Int. of MIKE CONWAY

DOCKET NUMBER:

PLACE OF PROCEEDING: Scriba, N.Y.

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.

Jon Hundley

JON HUNDLEY
Official Reporter
Ann Riley & Associates, Ltd.