BEFORE THE FACT FINDING TASK FORCE

OF THE NUCLEAR REGULATORY COMMISSION

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Re: :

Davis-Besse event :

of June 9, 1985 :

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INTERVIEW OF TED LEHMAN

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Interview of TED LEHMAN by the Nuclear Regulatory Commission Fact Finding Task Force, taken before me, Anne I. McBrayer, a Notary Public in and for the State of Ohio, at the Site Emergency Operations Center, Davis-Besse Nuclear Plant, Oak Harbor, Ohio, on Wednesday, June 12, 1985, at 9:08 o'clock a.m.

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APPEARANCES:

U.S. Nuclear Regulatory Commission
4340 East West Highway
Bethesda, Maryland 20814
By Mr. Steve Burns,

On behalf of the Nuclear Regulatory Commission.

Members of the Team:

Wayne Lanning
Larry Bell
J. T. Beard
Ernie Rossi

TED LEHMAN

being called as a witness, was interviewed as follows:

EXAMINATION

BY MR. ROSSI:

Q. Okay. This is Ted Lehman. And, Ted, why don't you tell us what your position in the company is?

A. Okay. I hold the position of shift supervisor. I've held that since July 1st of 1981. Before that, I was an assistant shift supervisor since the beginning of the plant operation. I was one of the original coal license members. Been in the program since April of 1972.

Q. Okay. And you were on duty, I guess, the night of the 9th?

A. 9th, yes, I was.

Q. At the time that you had the problem with the main feedwater pump?

A. Yes.

Q. Maybe the best thing to do is to have him describe what occurred and refer to any graphs or records that you have?

BY MR. BEARD:

Q. Can I ask you one sort of administrative thing?

A. Go ahead.

Q. You were on that shift. What time at this plant does that shift start?

A. Twelve midnight.

Q. It starts at twelve midnight. In any event, we're talking about it took place at roughly 1:30 in the morning, so you had been on duty an hour and a half?

A. Hour and a half.

Q. And I presume when you came on duty in your turnover, the shift from the previous shift to you folks, there were no significant or unusual plant conditions or maybe you could cover that so it would give us a background of where we're coming into this from.

BY MR. ROSSI:

Q. It might be good if you started at the time you came onto the shift and tell us, you know, what, if anything, occurred?

A. When we came on shift, the plant was at 90 percent power, 800, roughly 820 megawatts electrical. We -- the only significant difference from normal

operations, we had had problems with the main feed pump oil systems. As a result of that, we were running with the No. 1 main feed pump in automatic, and No. 2 main feed pump was in manual.

BY MR. BEARD:

Q. When you say oil system, Ted, you're not talking about lube oil, are you?

A. No, control oil.

Q. Control oil. Okay. Just want to make sure that's clear.

A. Yes. We had problems of -- when we were coming up from the last trip that we'd had, during that trip both main feed pumps had tripped shortly after the reactor tripped. During the investigation of that, they discovered an anomaly in the oil system for the No. 1 main feed pump. They didn't really have a resolution to that.

While they were down, they instrumented both pumps. And then we brought the plant up, and they were just going to watch the instrumentation. See if they could find anything out about that. They wanted one pump to be run in automatic, one pump manually. They didn't have any preference which one was which. We just, you know, we had the

line up we did in the way we started up.

Q. Was there some rationale as to why one automatic and why one manual?

A. Just in case something -- if something would happen, we'd have one pump that wasn't relying on the control oil system as such.

Q. So the oil system that you were having difficulties with was relating to the automatic control and not related to the manual?

A. That was the theory.

Q. Okay.

A. It had problems before where both pumps would tend to -- oh, what can I say. They were thinking that -- we have a, what they called, rapid feedwater reduction system on our feedwater pump that is supposed to aid in our feedwater control following a trip, post trip. One of the functions of that system is to increase the main feed pump speed to keep our feedwater delta P high due to the increased steam pressure.

One of the theories was that the rapid increase that the system would give to the feed pumps might be causing the lube oil system to -- or not the lube oil, but the control oil to fail in

some method. Not necessarily fail, but have a malfunction, some method that would cause the pumps to trip.

Because of that, they wanted us to run with one feed pump in manual such that it would not respond to that rapid feedwater reduction system in the event it would trip.

Q. So the control system that was apparently involved was the rapid reduction part, which as I think is -- is that now part of the integrated control system?

A. It's tied into the integrated control system. It's not really a fault in a rapid feedwater reduction, but more in response of the feed pump to that. It would only appear usually during a trip.

Q. Okay. So it wouldn't --

A. A post trip.

Q. It wouldn't be involved with the automatic controls used to maintain the plant at stated power?

A. No.

Q. But only in a post trip situation?

A. Just in post trip is when it showed up before this.

BY MR. ROSSI:

Q. What sort of problems -- well, let me go back one step before that. Had this control system for the main feedwater pumps, this was something that was newly installed?

A. The control systems on the main feed pumps were put in during the last fueling outage.

Q. Which would have been what date about?

A. It was last fall.

Q. That's close enough.

A. Sometime. I can't remember exact dates on that. But it was installed during that outage. This was a new system from GE that was supposed to be of a considerable improvement over the original systems that came with the pumps.

BY MR. BEARD:

Q. In case I'm confused a bit, maybe you can help me understand this. Are you saying the rapid feedwater reduction system was installed during this outage or a new improved version of it was installed?

A. No. It was the actual control system for the feed pump. The actual control cabinet and control system for the feed pump itself was changed.

Q. Okay.

A. The rapid feedwater reduction, I couldn't give you the exact dates when that had been put in. It was sometime before even this. And that was just a modification to the ICS to aid in plant response to a reactor trip.

BY MR. ROSSI:

Q. Had they been having -- had you been having problems with the feedwater control system since last fall or --

A. No.

Q. -- had these --

A. Up until this time, it had been a pretty nice system.

Q. The new one?

A. Yes. It ran very smoothly. Gave us much better control of the pumps. The old one used to be -- well, just cantankerous. Sometimes we'd have trouble getting the pumps off gear when we were bringing the pumps up. We'd have to go down and crank on the controllers down there to get the thing to come up and just various problems like that. These were much better from that standpoint.

Q. And so the problems started like just during a recent reactor trip or --

A. Oh, it had been like -- we had a trip about a week before mine, and it started sometime shortly before that that they started experiencing some of these problems.

Q. So a couple of weeks is what you're saying?

A. At least.

BY MR. BELL:

Q. That was my -- you're talking like the feed pump problem started in May of '85 then?

A. I can't give you an exact date, but yeah, it was sometime previous to this they experienced some of these problems.

BY MR. ROSSI:

Q. But it was on the order of maybe a month previcus?

A. Yeah.

Q. Not several months previous?

A. Usually on a post trip condition. They'd never given us any problems while we were operating.

BY MR. BELL:

Q. And did, as a part of the recovery, did anybody other than instrument No. 1 feed pump, did anybody make any changes to the adjustments of the control oil system or did they just decide to

instrument the system and not troubleshoot the system?

A. They troubleshot the system as well as they could with the pump not running.

Q. Okay.

A. And there wasn't a lot they could see. So they -- the decision was made to not delay the start-up any longer, to just go ahead and put the instrumentation on the pump and start the plant back up and observe what would happen.

Q. Was there any discussion about limiting plant power to the maximum power you can make on only one feed pump while the other feed pump was being troubleshot?

A. No.

Q. So that you could get some actual -- there was no discussion like that?

A. That wasn't really considered.

Q. And one final condition. One final question, and I'll let you continue. You said the anomaly appeared in No. 1 main feed pump.

A. That was the one we observed it in first.

Q. Okay. And what sort of anomaly was that?

A. It was something that occurred that they

never could really say that it was related to the problems they had experienced with the pumps. With the pump on turning gear, when you would initially roll the pump up in speed, the standby pump would start just because of the, you know, as the control system picked up and the in-surge on the oil system, the second pump would kick in momentarily.

Q. So just let me interrupt you a minute. When this pump rolls up, then there's a reduction in oil pressure that picks up the standby pump? Apparent reduction in oil pressure?

A. Yeah, it's just. There's oil regulators in the system. The pumps put out something like 250 pounds of oil. And that's stepped down once for control oil and again for lube oil.

Q. Okay.

A. And it's just when you initially start rolling the pumps up until the pressure regulators can catch it, sometimes the pressure will just dip low enough it will catch the standby pump and bring it on. Then the, you know, the -- it will all level back out, and you'll turn the standby pump off.

As it occurred, we were starting to roll the pump up as such, and the standby pump came on.

And the operator looked down and saw that and he tripped it. As soon as he tripped the oil pump, the main feed pump tripped.

Q. So he caught it while pressure was still low?

A. Well, the pressure had apparently stabilized, but it shouldn't have done it under any case.

Q. What tripped the feed pump then?

A. As they subsequently found out, it was, for some reason, it was the thrust bearing wear detector trips, for whatever reason.

Q. Okay. Now --

A. They never -- they couldn't find anything that would say why this happened. It was just something that, you know, if you caught it at just the right time, just when the regulators were just, you know, starting to catch it, if you dump that standby pump, the main feed pump was tripped, and it was the thrust bearing wear detectors that would trip.

Q. Okay. Have you had any problems with dirt or foreign material in this control oil system that would make the system act erratically?

A. No.
Q. Plugs, small orifices or that kind of thing?
A. No.
Q. Okay. Thank you, sir.
BY MR. ROSSI:
Q. Have you had these same kind of problems with the main feedwater pump also; is that correct? I mean, you --
A. It wasn't found on the No. 2 pump.
Q. This problem wasn't?
A. No.
Q. The one that was found during troubleshooting. But the tripping of a after-reactor trip had occurred on it too?
A. Yeah, on the last trip before this one, both pumps tripped within a matter of seconds of each other, immediately after the trip.
BY MR. BEARD:
Q. Let me make sure I understood what you said earlier, Ted. The problem had been observed with the No. 1 main feed pump. And then for the start-up it was decided one in automatic and one in manual.

A. Yes.
Q. I think you indicated that the guidance that operators had received, it really didn't make any difference which one but whatever. But now when you did the start-up or when the start-up was done, which ones did you have in automatic and which one was in manual, do you remember?
A. When the plant finally got up on the line, they had 2 in manual and 1 in automatic.
Q. So No. 1 was in automatic and No. 2 was in manual?
A. Yes.
Q. And --
A. We discovered this problem one afternoon when we were on afternoon shift, and we played around with this. And, you know, everybody scratched their heads and looked at this. Then they decided they would go ahead and instrument the pump. Before they started up they tried to duplicate this problem again on the day shift, and they couldn't do it.
BY MR. ROSSI:
Q. This problem being the one where you tripped off the standby pump?

A. They couldn't duplicate the problem. So they figured maybe it was just -- maybe they just had to exercise the system or whatever. That was their explanation of it.

A decision was made to go ahead and take the plant up with the pumps in that configuration, and they didn't care which one we had in manual and which one we had in auto. It was up to our discretion.

BY MR. BELL:

Q. When the rapid feedwater reduction system sends a signal to increase main feed pump speed, does that involve an increase in control pressure in that feed pump to position the governor valve?

A. Not an increase.

Q. How do we ramp those valves up to a higher position then?

A. Well, they're hydraulic. There's -- the system will put just -- put more oil to the cylinder, the operating cylinder, and it hits the valves.

Q. So when it does put more oil to this operating cylinder in the position, the low pressure poppetts, then there -- then this regulator has to reposition to hold a constant control oil pressure?

A. I would assume that much.
Q. Okay.
A. I can't -- you know, you're getting a little bit past my knowledge of the -- just how the system operates. But it's my understanding of it.
Q. All right, sir. Thank you.
BY MR. BEARD:
Q. In summary then, when you came on shift at midnight, the only, quote, unusual thing you had to contend with was this problem on the main feed pumps. And everything else ran pretty much as typical?
A. Yes.
BY MR. ROSSI:
Q. And then things stayed that way until 1:30, just steady state of operation?
A. Steady state.
Q. Uneventful.
A. It was quiet, you know. Night shift. Nothing abnormal was happening. The weekend, there were no extra maintenance personnel then. So there was no testing, no maintenance of any kind going on. Just a very quiet Sunday morning.
BY MR. LANNING:
Q. Do you recall any problem with the source

range detectors or anything to do with the source range?

A. The No. 1 source range was declared unoperable.

BY MR. BEARD:

Q. Was it really inoperable, Ted, or was it legally inoperable on some technicality?

A. We've had the problem with the No. 1 source range in that as it's -- when it's -- the source range during power operation is normally deenergized.

Q. Right.

A. For whatever reason a static charge tends to build up on the center probe or the center lead of the cable, and that feeds through the circuit. And with the thing deenergized, it will sit there, and it will read counts, 30, 40, 50, maybe higher counts on source range. And, you know, by rights, it's not right and we declared it inoperable per textbooks.

BY MR. LANNING:

Q. How long has it been in this condition?

A. Really it's been quite a while. It will be in a condition like that. If the instrument and

control technicians come over and they'll do the ST on it, it will straighten back out and come down and it will read right.

Q. I see.

BY MR. BEARD:

Q. And then I guess after a period of time, the misbehavior reoccurs?

A. Sometimes it will reoccur and wind up in the same condition again.

Q. Following up on that same line, was it inoperable such that in your opinion that on a plant trip you wouldn't be able to depend upon its release or did it have this misbehavior that only seemed to occur related to when you were at power and the detector was turned off so that it's been --

A. It only happened when we were at power and the detector was off.

Q. So you, as a supervisor or as an operator, you -- did you feel that you could have depended upon its reading on a post trip situation or --

A. I wasn't concerned about it.

Q. Okay.

A. As such. That was no concern.

Q. Okay.

BY MR. ROSSI:

Q. Okay. Why don't you go on then and describe how you first noted that something was happening and tell us what you observed about the event.

A. I was in my office, and I had just gotten up. I don't even know where I was going to go now. But I heard something start to wind down. The shift supervisor's office sits in somewhat of a unique position in that in that one spot, you can hear a majority of the larger equipment that runs in the plant. And I heard something just start to wind down.

I immediately went over to the control room and discovered that the No. 1 feed pump had tripped. The plant was in a runback. The RO had gone to the No. 2 feed pump controller and was attempting to raise it in manual and attempt to bring the fee water pressure and the flow up. He wasn't successful in this. The plant tripped on RCS pressure. We went into our emergency procedure for reactor trip. Started --

BY MR. BELL:

Q. This --

A. That one right there.
Q. This is their emergency trip procedure EP 1202.01.
BY MR. BEARD:
Q. This is your -- you use the term emergency procedure, and that's a proper name. But it's really the procedure that you use on any plant trip; is that correct?
A. Yes.
Q. Okay.
A. The assistant shift supervisor had opened the procedure up, gone to the immediate actions and read through those. And then started through the supplementary actions in the procedure which verifies the reactors trip, turbine trip, rods in the bottom, turbine valves are closed, electrical power, station air, instrument air, it goes through a whole list of parameters to check.
Q. Now, in that area comes up the question about what indication did you have on your nuclear instrumentation system of the flux level at that time?
A. Normal post trip. It would be in the intermediate range.

Q. You were still in the intermediate range at that time?

A. Yes, decaying down immediately after trip. It takes quite a few minutes to get down into the source range post trip. We were going through that. At the same time I was observing the feedwater system along with the RO that had been trying to bring the feed pump up. One of our concerns was too that the feedwater system would cut back and come down onto low level limits on the steam generators and hold there.

We've had occasions where it would undershoot, and we would have a SFRCS actuation on low steam generator level. So I was watching this pretty close as the levels came down. And levels came down nicely, came right in. We watched the valves, the start-up feedwater valves pick up. The levels came in right at low level limits and appeared to be stable. Was looking real good. During this period of time the safeties had been lifting, and then they reseated.

Q. You're talking about steam line safeties?

A. Yes, main steam line safeties, which, you know, as they should have. And then as we were

observing this, all of a sudden the safeties picked up again, which was unusual. I looked up to see what was causing this and discovered that the MSIVs had gone closed for no apparent reason that we could discern.

We immediately checked the enunciators. We had no SFRCS trip as would be indicated by those. We had no other equipment actuation which would indicate an SFRCS trip. No --

Q. No ESF either?

A. Nothing. Just had gone closed.

Q. With regard to enunciators, just to give me a feel for it, how many enunciators were on roughly prior to the start of the event? I mean, are we talking half a dozen, a dozen?

A. We would normally have maybe -- maybe a dozen.

Q. Okay. So that prior to the event, there was maybe a dozen lit. Now, at the time that you found out that the MSIVs were closing, you were looking around for causes. And one of the places you had looked was the enunciator panels. About roughly, if you can remember, how many panels were lit at that time? 200, 20?

A. No. Let me think about this for a minute.
A. I'd have to say maybe 30, 40.
Q. 30 or 40, okay.
A. That is a rough guess.
Q. I was just trying to get a feel for about how many.
A. The enunciator panel that I was looking at had none lit on it.
Q. Now, is this a special enunciator panel?
A. The enunciators are divided up into sections around there, and there's one section that has all the SFRCS alarms on it.
Q. That's it was the SFRCS enunciator panel?
A. And it had nothing lit on it. It's got the SFRCS alarms and steam generator level on it. And it's the first place I looked, and it was blank. Nothing lit.
Q. Do you have a separate enunciator panel for the ESF actuation system?
A. Yes, clear over on the other side.
Q. Were any of those lit as you remember?
A. For emergency safety features?
Q. Yes.
A. Nothing for that.

Q. Okay.

A. We had enunciators for the RPS system that would be associated with the reactor trip. Most of the enunciators were normal for the reactor trip and for the trip of the main feed pump.

Q. Okay.

A. There was really nothing abnormal in the enunciators that we had for the conditions we had.

Q. So I guess I interrupt you quite a bit, but I think the point you were at was that you found that the one steam safeties had basically lifted and, I guess you were saying, stayed open. And in looking to that, you found the two MSIVs closed, and you looked around and found no obvious reason why they closed, is that about where you were?

A. It wasn't just one safety. A number of them lifted again. It's hard to tell. A loud roar. And when I looked up to see what the cause of that was, the first thing that caught my eye, we got two big lights over there that are indicators for the MSIVs, and they are closed.

BY MR. BELL:

Q. Ted, it's normal on any reactor lift to lift the safety valves?

A. Yes.

Q. And when they closed, you thought everything was normal. And when the steam shot up, that increased steam pressure for the second time, and safeties lifted for the second time, and that's the abnormal lift?

A. It was the second lift of the safeties that caught my attention, yes. The initial lift of the safeties is normal. We'll lift all 18 safeties, and they'll blow for a given period of time and then reseat. Sometimes you'll get one that -- well, you know, any main steam safety, code safety, is -- can be erratic. Sometimes when they get hot, they'll simmer and sometimes relift a little bit. But this was a major blow the second time, and that was what brought my attention up. And I looked around and saw the MSIVs were closed.

BY MR. BEARD:

Q. So the first abnormality in this post trip situation was the closure of the MSIVs?

A. Yes, because up until that time, the -- for a post trip, the conditions were looking good. I felt our chances of stablizing out were very good at the time. And I was surprised to see those

things going shut especially with no other indications as to what closed them.

BY MR. LANNING:

Q. What type of signals would normally close the MSIVs?

A. The only thing that we've got would really close them would be an SFRCS actuation.

BY MR. BEARD:

Q. You mentioned in answer tc the question about what signals would operate the MSIVs?

A. Yes.

Q. That the steam feed rupture control system would cause that?

A. Yes.

Q. My question was, would the ESF actuation system also cause it?

A. Yes.

Q. Okay. Are those basically the only two sources of automatic closure signals to the MSIVs?

A. Yes.

Q. Okay.

A. Okay. Having seen the safeties were -- having seen that the MSIVs were closed, we knew there wasn't going to be any easy way out of it.

You know, it's not something that you can immediately reopen. They were closed, and they were going to stay that way.

So in anticipation of an SFRCS actuation, which we knew we would get if we waited long enough, the steam generator levels would boil down, and we would pick up a low level trip, the reactor operator asked permission to trip SFRCS manually.

Q. It's anticipatory?

A. Anticipatory. It's just an anticipatory action, you know. The quicker we can get ourselves -- the sooner we catch the steam generator levels, the better off we'd be. He went over to the back panel and tripped the SFRCS.

Q. By back panel --

A. The vertical panels.

Q. The vertical panel in the main control room, not a back panel in the sense of --

A. No, just the vertical panels as opposed to the bench panels in the front. He went back and tripped the SFRCS. Came back around. And we watched for proper actuation of the auxiliary feedwater system. The first thing I saw were the aux. feedwater segregation valves. It's AF 69

through 72. These are the runs that line up the feedwater flow for whichever steam generator.

I looked at those, and the valves were lined up such that 1 would feed 2 and 2 would feed 1. This was abnormal for a low level trip. They should have lined up so that No. 1 system would fit in No. 1 generator and No. 2 would feed No. 2.

The RO looked at that and immediately looked over to the back panel and observed that he had tripped the SFRCS system on low steam generator pressure rather than low levels.

Q. So it was at the point that you realized the aux. feedwater trains had lined up in a crisscross pattern rather than a straight-in pattern --

A. Yes.

Q. -- that you deduced that the actuation had not been a desirable one?

A. Yes. I immediately walked to the back panel myself. We reset the low pressure trips and retripped it on low level.

Q. Okay.

A. It was during this same time that the aux. feed pumps had started, come up in speed. And the

RO observed them coasting back down again and looked up, and we had the overspeed trip alarms in for both.

Q. On both?

A. For both aux. feed pumps.

Q. What's a normal start-up time on one of your aux. feed pumps from the time, for example, if the -- if the operator had gone over and hit this manual actuation, what's a typical response time that the pump would be up to proper feed and be able to put out water?

A. It could be 25, 30 seconds.

Q. Okay.

BY MR. LANNING:

Q. Did the RO realize he had pushed the wrong buttons?

A. He was the first one to see it. He discovered his own mistake. And we immediately reset it.

BY MR. ROSSI:

Q. And you noticed both aux. feed pumps now had tripped?

A. Yes. At the same time, while this was occurring, the assistant shift supervisor had walked around to the back panel to verify proper actuation

of the steam valves that supply the aux. feed pumps. It was while he was back there that he observed that AF 599 and AF 608, which are the aux. feedwater stop valves, had closed. He attempted to reset and open these valves.

BY MR. BEARD:

Q. Excuse me, was the closure of those valves a proper response or something abnormal?

A. It was a proper response for the low pressure trips that was initially inserted.

Q. Yes.

A. They should have come back open.

Q. Based on the resetting of the low pressure actuation, manual input of the low pressure actuation followed by the manual input of low level actuation?

A. Yes, sir.

Q. Okay.

BY MR. ROSSI:

Q. Those valve numbers, again, those were aux. feed numbers, and their numbers were?

A. AF 599 and AF 608. Okay. These valves were observed to be closed. He immediately hit the resets and tried to reopen them.

BY MR. BEARD:

Q. Now, resets here, you're talking about a local component reset versus a system?

A. Yes. It's a local -- it's a local component reset on each valve. They've each got a reset button. And then each valve has two controllers. Both of those have to be hit to open them.

Q. Okay.

A. He tried those. And the valves did not respond. He then immediately went to the cabinet room in the back to the SFRCS cabinets.

BY MR. ROSSI:

Q. This is the assistant shift supervisor?

A. This is the assistant, yeah, shift supervisor. And went to what we call initial bypass and block. This is a procedure that will clear any trips that are in the system and block them. Once he released on that, the system would have lined back up by the low level trips that were locked into them.

BY MR. BEARD:

Q. But it would -- would it block the manual input or --

A. No, it would not block the manual input if manual input was locked into them. Once you push those buttons, they're locked in.

Q. I guess I'm getting a little confused on the word lock and block.

A. The manual trip buttons that we have in the control room for the SFRCS system are the type that once you depress them, they lock in place.

Q. Physically stay depressed?

A. They physically stay depressed. You have to hit a -- I don't know what it's labeled, but it's a little button on the side to release that.

Q. Okay.

A. Those low level trips were locked into place. He went to initial bypass and block which clears all the trips that would be in it and let go of it.

Q. The manual low levels still being locked in. Okay.

A. You know, would have cleared the logic. And the system, if there was any problems in the logic, should have lined back up. As it turns out, the system was lining back up as it should have anyway. AF 599 and 608 apparently, when they went

closed and tried to reopen, torqued out.

BY MR. BELL:

Q. Let me interrupt your train of thought one second. This initial bypass and block then would clear out any trip signals that had been sensed because of transmitter inputs?

A. Yes.

Q. Okay. But since you had manually initiated it, you said you manually initiated low level.

A. Yes.

Q. That signal would have remained sealed in because it would be --

A. Yes.

Q. -- still present because the buttons are still depressed?

A. Yes.

Q. Okay.

A. Now --

BY MR. ROSSI:

Q. Okay. The two valves are still -- he's still not able to get the two valves open?

A. They're still closed.

Q. Still closed.

A. Now, when --

BY MR. LANNING:

Q. Excuse me a second. Let me ask a question. Are we on procedures now, training to go and perform this or --

A. Well, that was not. That was not. That is not a procedural step, but it was not a bad step to do at the time.

Q. Okay.

A. Now, let me back up a little bit here. When the RO observed that the aux. feed pumps had tripped, two EOs were immediately dispatched to the aux. feed room.

BY MR. BEARD:

Q. EO being equipment operators?

A. Equipment operators.

Q. Nonlicensed equipment operators?

A. Nonlicensed equipment operators. Were immediately dispatched to the aux. feed room. Let me catch my train of thought here. After the assistant shift supervisor came back into the control room and observed that the valves were still closed and the pumps had tripped, he immediately left the control room to enable the start-up feed

pump. This is something that has to be done out in the plant. It is kept valved out of service and the breakers racked out.

Q. This is the start-up feed pump?

A. This is the start-up feed pump. This is a motor driven feed pump that takes the suction off the main feedwater and is used just for start-up conditions. He immediately left the control room to go put that pump in service. At the same time, I went to my office to the locked valve key locker, took out a locked valve key, gave it to another equipment operator, and directed him to go into the aux. building and manually open AF 599 and 608.

Q. So at this point, if I -- trying to get the big picture here, you'd lost main feed. The aux. feeds didn't seem to work right. And the region was a problem with the pumps on trip and the valves?

A. And the valves.

Q. And so at this point you seemed to be saying the assistant shift supervisor was working on a new pump which would be activating the start-up feed pump?

A. Yes.

Q. You were working with an equipment operator on the valve side of the auxiliary feed pumps?

A. Yes.

Q. And so you had a parallel pass there in order to get feedwater someplace?

A. Yes.

BY MR. ROSSI:

Q. Now, the RO had observed the aux. feed pumps that tripped and sent two EOs to reset the aux. feed pumps. Where did they have to go, the EOs, to do that?

A. They had to go down into the aux. feed pump room.

Q. Okay. And these other valves, or the valves AF 599 and AF 608, where are they?

A. They are over in the auxiliary building.

Q. And he needed keys to manually open the valves?

A. Yes, those are locked valves, and they are -- the hand wheels are chained. They had to be unlocked so that they could manually operate the valves.

BY MR. BEARD:

Q. What about security of getting through locked doors for vital areas and things of this nature? To what extent were they involved in either of these two in-plant manipulations?

A. In the aux. building, all the doors were on card readers.

Q. Card readers?

A. Card readers, which their ID badge would open. There was no problem with that. The men that went to the aux. feed pump room had to unlock a padlock and slide back a hatch to get down into the room.

Q. Now, the unlocking of the padlock, where do they have to go or how do they get a key to this padlock?

A. They have a key on the key rings that they normally carry.

Q. Okay.

A. That would give them access to that room.

Q. So they didn't have to go any special place or call the guard or anything to go in there?

A. No.

Q. They just whip it out from the side of their hip?

A. That's right. They had the keys on them. The only key that had to be obtained was the locked valve key that I gave to the primary equipment operator to unlock the valves.

Q. Okay.

BY MR. ROSSI:

Q. Let me ask you another question about the card readers that allow the people to go through the doors to get to the auxiliary building. They're controlled by a computer?

A. Yes, sir.

Q. If that computer is out of service, what happens to the doors?

A. The doors will not respond to a card. Then they have to go -- resort to keys.

Q. And did they have the keys with them to do that had the doors not responded to the card readers?

A. I don't know. The equipment operators on the primary site don't normally carry a key ring. They have no need for it. I would say that he probably did not have any keys on him as such.

BY MR. BEARD:

Q. Well, in the event that should occur, what would be the normal thing that you would expect your

people to do when they get down there and find the card readers misbehaving? Would it be to call security to get a guard over so they could open it for them or what would you typically expect?

A. It would probably be quicker for the man to come back to my office and take a set of master keys.

Q. I see. Okay.

BY MR. BELL:

Q. He wouldn't have to suit out or suit in to go into this part of the auxiliary room?

A. No. That was not required for any of the operations that had to be done in this instant.

Q. Okay. So now you've got gentlemen going down to -- the assistant shift supervisor's going down to line the start-up feed pump. And one of your equipment operators is going to line up the auxiliary feed pump turbines, reset those?

A. Two men.

Q. Two men. And the fourth man is going to open AF 599 and 608.

A. And 608.

Q. Would you tell me how close valves FW 106 and FW 89 are physically? I've got a print here.

Q. Okay.
A. 106 and 85.
Q. Those are the two possible suction sources to the start?
A. Yeah, he jumped on 106. How close.
Q. He opens 106, right?
A. Um-hmm.
Q. And if he opens 85, we put the DFT right to the suction of the off-speed pumps; is that right?
A. Yes. Let me see your print.
Q. This was given to us yesterday.
MR. BURNS: Why don't you identify what you're showing him?
Q. This is training print figure 1 that came from P&IDM 006 B. Here is 106. This is the normal suction valve, right?
A. Wait a minute. That's the discharge.
Q. Yes, excuse me, discharge. He has to open --
A. He got 85.
Q. He opens 85? Or does he open 32?
A. No, wait a minute. This is 32. It would be 32. And then 106 would be the discharge.
Q. And 32 then lines up the start-up feed

pump from the DFT?

A. Yes.

Q. And 106 lines up the discharge of the start-up pump up through to the normal feed header?

A. Yes.

Q. Okay. Are 85 and 32 very close together physically? This valve and this valve?

A. They're not that far apart. They're in close proximity.

Q. Okay. Thank you, sir.

BY MR. BEARD:

Q. I hope you understand, Ted, that the barrage of questions that we're giving you are intended only to get a detailed knowledge of what happened and what did not happen. We are not criticizing your actions whatsoever?

A. No, I'm not -- that's the impression I get.

Q. We're just trying to understand. I mean, after all, you know this plant a lot better than we do.

BY MR. ROSSI:

Q. Okay. So the two EOs have gone off to reset the aux. feed pump controls. The assistant shift supervisor has left the control room to put

the start-up feedwater pump in service. And the third EO has gone to open AF 599 and AF 608.

A. Yes, sir.

Q. I think that's where we were with that story?

A. Yeah.

Q. Okay. Why don't you continue?

BY MR. BEARD:

Q. Can I -- just to get it in perspective, when all these things were going on, what was your feel for the overall plant condition in terms of did you have on your hand -- obviously, some of these are absurd answers, but let me give you a couple -- a routine reactor trip, an accident that could possibly lead to core meld, a slightly complicated reactor trip or a near miss to an accident or, you know, what overall feel did you have for the plant condition you were trying to cope with?

A. We realized that we were in a total loss of feedwater. We also realized that this was the condition that started off TMI-2. By this time, things were getting a little shaky. I had been on the telephone probably since the time we discovered that the MSIVs had gone closed. I'd gotten Bill

O'Connor, the operations engineer, on the telephone and I talked with him. It's probably somewhere in the period we're in right now. He hung up so he could make other phone calls to other people.

Q. Were these phone calls for notification or technical advice?

A. No for notification. He wanted to get ahold of the plant manager and the operations supervisor. During this period of time I attempted one more time to open AF 599 and 608. It was while I was attempting to do this I noticed that one of them came open. A couple of minutes later the second one came open.

We had the steam valves were already open, and the valves on the feedwater side of the system were now open. So we had a flow path, steam too and feedwater from the aux. water feed pumps. We were now relying on, for that system, on the EOs that were in the room to get the pumps started.

BY MR. ROSSI:

Q. The opening of AF 599 and AF 608, was that -- or maybe you don't know the answer to this. Was that because of the EO that had gone to open them?

A. Yes.
Q. Or -- not your attempt?
A. That was his efforts.
Q. His efforts. Okay.
A. Because they opened while I -- I wasn't pushing anything.
Q. Okay.
A. By this time, I just notice that the one came open, and then a couple minutes later the second one came open. That was his efforts that opened those valves.
BY MR. BEARD:
Q. I'm really trying to get a feel, Ted, for the gravity of the overall situation as it was perceived, not the way the equipment is responding at the minute. Just to take a snapshot, you know, how big or how bad did you see it?
A. Okay. By this time, each time I looked up -- we've got a big T ave meter on the back panel. Each time I looked up, the temperature was higher and higher. We realized this. It had been mentioned once from Bill O'Connor, as I was talking to him, you know. He says we have to consider the possibility of HPI PORV cooling.

As the RO and I were waiting for the equipment operator to get the aux. feed pumps running, it was mentioned again. And we realized the gravity of the situation. As the temperature got higher, we were approaching a point where we were going to have to do it if something didn't occur quickly.

By this time, Bill O'Connor had called me back, and we were talking. And he mentioned it again, that if we didn't get it back shortly, we would have to go to make up HPI PORV cooling. It was just at this time, 'cause I mean, by now it was getting right to the fine edge. It was right at this time that the start-up feed pump came available.

Q. The start-up was the first one available?

A. The start-up was the first one to come back. The RO immediately started the pump. Opened the start-up feedwater valve for the No. 1 steam generator. Those have SFRCS closures to them. During this period of time, the second RO had gone to the back of the cabinet room and reset those. So we were set that way.

He immediately started the pump and opened the valve and got feedwater flow into the No. 1

steam generator. That immediately turned our temperature rise and started decreasing RCS pressure. This gave us a little bit of relief, mental relief.

Q. Yes. What was the emotional state of your people in the control room, the operators that worked for you, in the sense of how were they handling themselves? This obviously was a tense situation I would presume?

A. They handled themselves quite well.

Q. Well, I didn't mean it that way, Ted, I'm sorry. I meant -- well, let me just let you answer. I'm sorry.

A. The operator that was handling the primary side was -- was doing it quite well. I did not get the impression from him that he was having any problems. He didn't convey to me that he had any problems on his side. I left him do his job.

The reactor operator who was on the feedwater side realized just how close we were getting, and he wanted a feed pump of some kind back in the worst way. I don't know what more I could say.

Q. Okay. The last --

A. You know, it was a tough situation. You

know, the adrenaline was flowing.

Q. The last question I had in mind in this line is with regard to the HPI and PORV cooling mode, which is sometimes referred to as feed and bleed, did your training or your procedures have some predecided threshold at which you would enter that mode of operation or was it a judgment call?

A. Okay. It's right in the procedure that if both generators go dry, as defined by levels less than eight inches or pressures less than 960 and decreasing, you're there.

Q. Okay.

A. We never observed levels in the generators less than 10. And I personally never saw pressures any less than in the range of 950 to 975, and they held fairly stable. Generators were bottled up fairly tight. They were holding steam pressure. So we were, you know, still clear on that standpoint of it. It was an option, but it was one that was coming very close.

Q. I guess I was thinking of earlier you mentioned that the T ave indications were continuing to rise.

A. Yes.

Q. And I got the impression that maybe that was a key indicator to you that it was getting close to time to do something?

A. Well, it was one that I could see the clearest.

Q. Okay.

A. We realized that, that you know, that temperature rise was coming because, you know, we were getting insufficient cooling. The highest I saw it go was 590 degrees.

BY MR. ROSSI:

Q. Steam generators being empty by having levels less than 8 inches or pressures less than 960, is that in itself the trigger point for going to HPI PORV cooling?

A. That's as it's stated in the emergency procedure.

BY MR. BEARD:

Q. Okay. Was there anything done or did you direct anything to do to line up the systems in anticipation or in preparation for going into that feed and bleed mode of cooling?

A. Not at that time.

Q. Not at that time?

A. It's a procedure that is quick. It wouldn't take very much at all for us to do it.

Q. I'm not criticizing you for that.

A. No, I know. But it would just be a matter of starting the pump and opening the valves. And then the primary operator would open up the PORV and lock it open.

Q. What about the area of piggybacking the HPI on top of the LPI?

A. That could be done if needed.

Q. All right. Do you know whether or not such a configuration was, in fact, established?

A. Not at that time.

Q. Okay.

A. We had the start-up feed pump back, and we were putting water in the No. 1 generator. Shortly after this, the number two aux. feedwater pump started up. The EOs in the room had considerable trouble getting the pumps --

BY MR. ROSSI:

Q. I'm sorry, which one started?

A. The No. 2.

Q. The No. 2 aux. feed. Okay.

A. The EOs in the room had considerable

trouble getting the pumps latched. It's got a, what they call, a trip throttle valve that has to be latched up and then opened. And they had considerable trouble getting these valves latched.

They finally got the No. 2 pump started. It came up to speed and gave us a lot of feedwater quickly. He had trouble -- the RO had trouble getting control of this pump to start with. And we really filled the generator higher than he would have wanted to at the time.

The SFRCS system only brought the level up to 46 inches. We took it in excess of that, close to a hundred. I know it was in excess of 75 inches. This caused a rather rapid shrink on the RCS and pressure. Pressure fell rapidly. It got down to 1700 pounds. Primary side RO requested permission to put on HPI to help recover his pressure in the system.

BY MR. BEARD:

Q. May I interrupt at this point. Do you believe that the depressurization on the primary side was largely caused by the higher than desirable level on the steam generator?

A. Yes. I have no doubt.

Q. Okay.

A. That was -- we put a lot of cold water in the generator quickly. And there was no doubt that that's what caused it to shrink. He asked permission to put on HPI. We told him to piggyback LPI to HPI. And he did such. That was on for a period of maybe five minutes.

We never observed any flow from the HPI system during this time. We were told later by the tech section that their printouts indicated that we had put some water in. It was just of such a magnitude that we couldn't see it. By this time, the secondary side RO had gotten his other aux. feed pump started. And it was blind water also.

He had level control problems with this pump to the extent that he never did get control of it in the control room. That pump was controlled using that trip throttle valve as a throttle valve by one of the equipment operators in the aux. feed pump room being directed over the Gai-Tronics system.

Q. You're saying I think on the No. 2 feed -- No. 1?

A. No. 1.

Q. No. 1, the automatic controls in the

control room apparently weren't functioning properly?
A. They did not function properly.
Q. And the manual controls in the control room, the operator could have used, apparently weren't functioning properly also. So what you ended up with was local manual, if you will?
A. Yes.
Q. Via communications on it?
A. Yes. And he did subsequently get manual control of the No. 2 aux. feed pump on his panel. So we at this time had three pumps giving us feedwater. The configuration we wound up in was the No. 1 steam generator was being fed by the start-up feed pump. The No. 2 steam generator was being fed by the No. 2 steam aux. feed jump. The No. 1 aux. feed pump was left rolling just with the pressure backed off just enough that it wasn't feeding just because of the control problems he was having with that.
Q. Okay. Does that pump have a miniflow recirc line it was using there?
A. Yes.
Q. [illegible] that gets you in pretty good shape, I would imagine, now that you've got three feed pumps?

A. By this time everybody was a little more relaxed. We had a chance to step back and look at our plant conditions.

Q. Yes.

A. The RO was establishing levels of 50 -- roughly 50 inches in each steam generator. The primary side RO was getting good control of the RCS back. His pressure was coming back up. He was getting control of his pressurizer level. He was getting stable on that side.

Q. One area that you haven't talked about, let's go back to the primary side of the plant. Let me see. I think you indicated that because of the high level, the overfeed, if you will, on one of the steam generators, the primary side experienced some shrink, the pressure started coming down with that as a primary driving force, and I think you indicated you may have gotten as low as say 1700 pounds?

A. Yes.

Q. Okay. What about earlier in the event, before the aux. feed pumps were brought on on the primary side, did you have any experience with regard to relief valves?

A. The PORV lifted.
Q. PORV is P.O.R.V.?
A. Power operated relief valve lifted at least once that I knew of, 'cause I heard him say it. But it popped and reseated, which was -- it was doing the function it was designed for.
Q. Right.
A. He never indicated he was having any problems with it. As it turned out later, it lifted three times. And on the -- on the decrease in pressure, he isolated the valve as the pressure fell.
BY MR. BELL:
Q. Was that just a gut reaction?
A. That was a gut reaction on his part. He just -- he didn't like the way the pressure was falling. He wanted to get control of it quickly. And as the history of power operated release, his pressure was low enough he felt confident. He isolated it for a period of time.
BY MR. ROSSI:
Q. That was an RO that did that?
A. Yes.
BY MR. BELL:
Q. Was there any time during -- I'm asking

you to read the other gentleman's mind, but was there any time that PORV -- that it was thought that the PORV had failed open?

A. At the time there was no conditions we could really point at. As it turned out later, his gut reaction was probably right because the printout showed that on that last decrease, the PORV had not gone closed yet.

Q. Okay. And --

A. And did not close until after he shut the block.

Q. Okay. And this decrease in pressure that caused the operator to shut the PORV block valve was caused by the introduction of feedwater into the steam generator?

A. Yes.

Q. And it was the PORV blowing you down?

A. It could have been both. We never did blow the rupture disk on the quench tank, so it couldn't have been excessive.

Q. If it was leaking, it was small?

A. That valve can't stay open long and maintain the integrity of the tank. It will blow the rupture disk out.

BY MR. BEARD:

Q. If I remember right from some of the design constructions, on the design basis, the quench tank is sized for about 15 to 30 seconds, somewhere on that? In other words, you could have a PORV open starting from full power and full pressure for something like 15 to 30 seconds before the rupture disk would go. Do you have any rough feel for how much of a pressure falloff that would amount to or -- I'm trying to understand, Ted, what's the significance of the point you didn't get to where the rupture disk would blow?

A. Well, you're asking me a question I don't know if I can answer.

Q. That's all right. That's all right. No problem.

A. The initial openings of the valve were very quick. They were just pops. It popped and blew the pressure down, and it pops back up a second time and then a third time. I can't give you a good feel for what our pressure would be when the ruptured disk would blow.

If conditions were stable and you opened the PORV, that's one thing. But we had -- we had a

high level on the pressurizer because of the overheating of the RCS. Plus we had been chucking excess water into it in response to the trip in an effort to, you know, maintain pressurizer level which was then subsequently heated, and that contributed. So the high pressurizer level would contribute to the overpressure. And I just can't give you a good feel for what kind of pressure we might be talking about on that.

Q. I guess the bottom line of what I think you're trying to convey to us, and correct me if I'm wrong, is that the -- a primary contributor to the decrease in pressure on the primary side was the high level and steam generator. And it's possible that the PORV was blowing down and contributing to a, let's say, a faster reduction in pressure?

A. Yes.

Q. And maybe it was the rate of pressure reduction that the operator reacted to and was, I'll say, suspicious of the PORV and chose to block it. And then subsequently you found out, in fact, that, yes, the PORV was open and did not reclose until after the block valve had been closed?

A. Yes.

Q. Is that the flavor you're trying --
A. That's, yeah, the majority of it. The major contributor to the pressure decrease was the overfeed of the steam generator.
Q. Okay.
A. It would have -- the amount of water we put in there at the rate we put it in probably would have masked the pressure decrease that he might have seen from the PORV being open. But just as a precaution on the pressure decrease, when the pressure was down to a point that he felt comfortable with, he isolated the thing.
Q. I see. But I gathered that you felt --
A. And a couple three minutes later he opened it back up.
Q. I gather you felt he was uneasy about it or decided that would be a prudent thing to do?
A. Yes, that was just a decision on his part.
Q. Were there any other systems, either primary or secondary side, that could have come into play that you happen to remember that would contribute to the pressure reduction? For example, the pressurizer sprays or anything of this nature? Maybe the heaters cut off or any other contributors

that you happen to remember?

A. Nothing that I heard of at the time. Anything that I know of now came after the incident was over that I learned of it. There was nothing at the time to indicate to me. It was just the initial pressure fall from the -- from the overfill of the generator was the biggest thing, which we all anticipated. He, to keep from a possible safety features actuation, requested and received permission to put in HPI for a short period of time, which might have helped. Other than that --

Q. So getting back to where we are then, I guess you've got a lot of feed available to you so the plant's pretty much back in good shape. Things are beginning to stabilize out.

A. Yes.

Q. And so now you're basically in a recovery mode of some sort, I guess?

A. Yes. Now our primary concern was just stabilizing the plant at a point. We wound up with RCS temperature at 546, about 50 inches in each steam generator. RCS pressure came back up to about 2100 pounds. The pressurizer level was high because of the amount of water that we put into the system

during this time. That was of no problem or concern as such. And we just tried to hold it at that point.

Q. Where were you at this time in regard to your nuclear instrumentation?

A. It was somewhere -- I can't give you an exact time. Somewhere in here we came onto the source ranges. The high voltage comes on automatically, and we discovered that neither one of them really worked. One was giving us what we felt to be an erroneous reading. The other one was off scale.

Q. Was it off scale high or low?

A. I want to say it was high. I can't really verify that. I looked at it quick, and it wasn't on scale one way or the other.

Q. Okay.

A. We went to our abnormal procedure for loss of neutron indication. Per that procedure, we went to an emergency boration condition.

Q. Before you get into that part, Ted, you said that both of them basically were misbehaving. You said one was off scale, and the other one was acting in a way to give you a reading that you didn't believe?

A. Yes.
Q. Could you give me some feel as to what kind of reading you saw, what kind of reading you would have expected? Like was it reading grossly abnormally low or grossly abnormally high or what?
A. No, really it was like mid scale.
Q. Mid scale.
A. But it -- it was mid scale when the high voltage came onto it.
Q. I see. And it should have been high?
A. It should have been high at that time and then decayed off, and it didn't. It just stayed where it was and just sat there.
Q. So it was a -- the abnormality was it was lower than it should have been, and it was relatively constant rather than falling as you would expect neutronics before to behave?
A. Yes. So we initiated emergency boration for that. We weren't overly concerned. We knew that we had been feeding water from the borate water storage tank into the system for a while. That's 1800 PPM boron. We knew we would have increasing Xenon from the post trip conditions which aids in our shutdown margin. And then we did start pumping

in concentrated boric acid. So the -- from the conditions that had gone before, this was something that had to be watched but was not a major concern at the time.

Q. What about the condition of the -- or the position of the control rods?

A. They were all on the bottom. That had been verified early in the trip. Just part of the post trip operator response, that the conditions we'd have to check. Those had been, immediately after the trip, had been verified all on the bottom.

Q. So would it be a proper summary to say that your feeling was that were the rods on the bottom and this that and the other, the core was not criticality in danger, but you only had an instrumentation problem?

A. Yes. I had no concerns about, you know, any inadvertent criticality at the time.

BY MR. BELL:

Q. I have about three quick questions.

A. Yes, sir.

Q. When, on a normal trip, when that high voltage is reenergized to a source range, and we're talking source range channel 2 that's not on scale

now?

A. Yes.

Q. You already told us source range channel 1 was not in service?

A. NI 2, yes. Well, you're going to have to -- NI 2 is channel 1 if you want to talk channels. You want to talk NI numbers?

Q. Okay. You tell me which one was out of service. What do you call it?

A. NI 2.

Q. NI 2 was out of service?

A. Yes, it was off scale.

Q. Now. NI 1 -- now, I'm talking about before the trip, NI 2 was the one you declared inoperable?

A. No, NI 1 was the one declared inoperable before the trip.

Q. NI 2, when the interchange turns it on, you should get a high start-up rate alarm comes on, right, because it spikes -- sees a rapid change in neutron level, did that enunciator come on?

A. I can't tell you.

Q. Did you have high voltage on the enunciator?

A. Yes, that was verified. The primary side RO went to the back cabinet.

Q. To the RPS?

A. To the RPS. Opened the cabinet to see the indication that was in there. It was also failed, but he did observe approximately 2,000 volts, high voltage, through the detectors.

Q. All right.

MR. ROSSI: Well, see, I had a question there. Was -- go ahead, finish.

MR. BELL: I've got two more, and I'll shut up.

BY MR. BELL:

Q. Also you haven't -- we were told in the earlier interview that SP6A failed.

MR. BEARD: 7A.

A. 7A.

Q. Excuse me, 7A failed during this transient also.

A. Yes.

Q. Did that give you any concern?

A. When we put the start-up feed pump on, the reactor operator grabbed for the control that was closest to him. That was 7B for the No. 1 generator.

And he got feedwater established to that.

Q. Okay.

A. He subsequent to that tried to get flow to the other steam generator through SP7A and got no satisfactory response from the valve that he could observe. Then, like the same time, he got the No. 2 aux. feed pump available. So he fed the No. 2 generator with the No. 2 aux. feed pump.

Q. Okay. Finally, during this trip that occurred in, I think you said, June the 2nd or so, the trip before this trip.

A. Yes.

Q. What caused those feed pumps to trip on that occasion? What -- you have no idea?

A. Can't tell you.

Q. Okay. I'm through.

MR. ROSSI: You asked the question that I wanted to ask, was about the SP7A, so you covered that. That's it.

BY MR. BEARD:

Q. I had a couple that were along the same line. This is, I think, a little further into the recovery stage or stabilization phase, Ted.

Do you remember any problems with regard

to the source of water for the No. 1 aux. feedwater pump?

A. Yes. That happened. When they were trying to bring the No. 1 aux. feedwater pump up, it tripped a second time. And at the same time it tripped, I don't know which came first, the suction to the pump swapped over to service water.

Q. That was unexpected or --

A. That was unexpected. I -- I don't know. I still don't know what caused it. There's a -- I saw the enunciator for high DP come in -- or -- there's a suction strainer for those pumps and it has a DP alarm across it. The enunciator came in. Same time the pump tripped, and the RO observed that the suctions had swapped.

Q. Okay.

A. We -- the EOs that were down in the aux. feed pump immediately started to relatch the pump. At the same time the RO opened the suction from the condensate storage tanks to the pump, and then I closed the service water valve, which lined up normal suction to the pump. Was after -- then after this was accomplished, they brought that pump up and in speed, and we kept it on.

Q. Okay. So there were -- if that spurious action -- it was a spurious action. It basically occurred once and didn't reoccur. In other words when you refigure back to the original configuration, it held in there?

A. Yes, that only happened that one time. I have no explanation for why that happened.

Q. Did you have any problems with turbine bypass valves?

A. Much later into the recovery. The SFRCS actuation, when it -- well, with the MSIVs closed, the turbine bypass valves served no purpose. There's no steam. Control goes to the atmospheric vent valves. We were using those for pressure control on the steam generators.

When they finally got the atmos -- or the MSIVs open, we swapped control to the turbine bypass valves. When they did this, on the -- let's see. It's SP13A. Would be on the No. 2 steam line. When they opened the MSIV for the No. 2 steam line, I was sitting in my office at the time.

I heard a rather loud -- it almost sounded like a rattle, but it was a water hammer. And sometime snortly after this, one of the equipment

operators called up and said that the -- one of the turbine bypass valves on that line was rather severely damaged. Broke it.

BY MR. BELL:

Q. Do you think that's a result of the opening the MSIV on that side?

A. They figured it got a slug of water in the line.

BY MR. BEARD:

Q. Is that typical, that you can get a water slug when you reopen the MSIVs or --

A. Here's what, in conjecture, happened is the main steam to aux. steam reducer, this is a valve that takes main steam, reduces it down 235 pounds for the auxiliary steam system of the plant. There is a desuperheating valve associated with that. So when the pressure on the steam is dropped, it doesn't super heat.

That valve malfunctions. We have a hard time with it because that comes off of main feedwater, and it will wind up with like 1100 pounds of pressure on one side of it, and it has a hard time controlling. The valve, as it turns out, the controller to this valve was out of service for

whatever reason.

INC was working on it. And the manual bypass was cracked open to provide desuperheating water for this thing. They figure while the MSIVs were closed, this desuperheating water just filled up the steam line, backed up the aux. steam system and put a slug of water in the main steam line. When the MSIV was subsequently opened and turbine bypass valves opened, that slug of water went right down the line and hit the turbine bypass valves.

BY MR. ROSSI:

Q. What did it do to the valve when you say it was severely damaged? Was it then leaking or --

A. It broke it. It broke the yoke right in half, and -- that's a rather substantial yoke on those things. It's quite heavy. Snapped it right in half. And broke the actuator. These things work on an air piston, and it just cracked it all the way around.

BY MR. BELL:

Q. You're talking both sides of the yoke?

A. Both sides of the yoke. The actuator was sitting there going up and down as the valve wanted to move. So with the valve moving, the actuator

went up and down, it broke off the valves and snapped the position feedback.

BY MR. BEARD:

Q. So a rather severe water hammer, wouldn't you say?

A. It was probably rather nasty at the time.

Q. Well, in the process of reopening the MSIVs, help me understand this one, does one normally open, say, a smaller valve around the MSIVs first?

A. Yes, we open up the bypass valve and pressurize the steam line. We have to get the delta P reduced down to --

Q. So you opened the main one?

A. As low as we can get it.

Q. Does that serve the purpose of warming the line downstream also?

A. It will warm the line as such.

Q. Okay.

A. And it's pressure -- you know, pressurizes the downstream side.

Q. And was that done during this?

A. Yes.

Q. So that the opening of the MSIV was done

in the normal sort of way. And the reason you had damage apparently was because an unusual source of water would fill up the lines is what did you?

A. Yes. Yes, that's not -- we normally don't have that kind of a problem.

BY MR. LANNING:

Q. I'd like to go back and discuss what alternative methods that you might have used if you had not been successful in getting this start-up feedwater pump operating. Did you give any thought to restoring the main feedwater pumps to operation?

A. That was completely out of the question.

Q. And why is that?

A. There was no steam available.

Q. Because the --

A. MSIVs were closed.

Q. And it must take a long period of time --

A. It takes a period of time, maybe 20, 30 minutes just to repressurize the line. Once you get the condition, you can do that.

Q. Now, if the MSIVs had not closed, could you have possibly used those pumps?

A. If the MSIVs had not closed, we would not have been in this condition at all.

Q. I don't understand.

A. We would not have -- the No. 2 feed pump would have supplied us all the feedwater we needed. The steam generators had come onto low level limits nicely. We would have gone out into a normal post trip configuration. We would have wound up right in a post trip window and we would have been in pretty decent shape.

Q. When would you have decided to use the feed and bleed method of removing heat from the reactor vessel?

A. When the start-up feed pump became available to us, at that period of time I was to the point where if it didn't happen within the next few seconds, I would have gone to the HPI PORV of cooling. And it was just -- you know, we had gone -- time was starting to stretch out, and we were to appear there in the control room where nothing was happening.

You know, we were just standing there. The guys were out working, and nothing was happening, and the plant was heating up. And it was just at the point where if it didn't happen now, we were going to have to go the other way. And right at

that time the start-up feed pump became available to us. And it was just a close decision right there.

Q. Do you have a lot of confidence in that method?

A. I have, you know, we've had training on that from B&W. We've observed it on the similarities. We have gone through the casualties that they've given us similar to this where you have a total loss of feedwater and you go to that situation, and we have followed it all the way down to cold shutdown.

And it appears to work well, if you want to say that. I mean, it's a method that works. It, you know, it makes a mess out of your plant, but it works. But, you know, you got to realize what your primary concern is, core integrity. You can't -- you know, if it comes to that, it comes to that.

Q. Were the subcooling meters of use during this transient?

A. Yes.

Q. How did you use them?

A. I mean, you know, they're right there. And we observed those things closely at various times, keeping track of our subcooling margin. And

we never observed a subcooling margin of any less than 47 degrees is the lowest we ever got. So we always --

BY MR. BEARD:

Q. What time during the event, do you remember the minimum subcooling occurring roughly? I don't mean clock time. I mean, what was going on?

A. Let me think.

Q. Was this before the aux. feed and start feeds got running, for example?

A. Yes, it would have been.

Q. Okay.

A. That was the lowest we saw. Once we got the feedwater in there and it cooled off, the margin became greater.

Q. Okay.

A. 47 -- 47 degrees was the lowest we saw at any one time.

BY MR. LANNING:

Q. From an operating standpoint, would you have preferred to have the start-up feedwater pump not locked out, not valved out?

A. Sure.

Q. Now, has it always been valved out?

A. No. I can't give you the dates that this came about, but it was discovered that the lines for the start-up feed pump had not been properly analyzed by Bechtel Engineering when the place was constructed, and there was the danger of a high energy line break from either the feedwater lines to the start-up feed pump or the cooling water lines which could endanger the aux. feed pump that sits in the same room. As a result of this, they made us -- when the pump was not in service, it has to be valved out.

Q. They is -- who is they?

A. The NRC.

Q. Okay.

BY MR. BEARD:

Q. Along the same line, when you say there is a danger of a high energy line break, are you referring to the case where a -- just a failure occurs or are you referring to the situation where there's some external phenomena such as seismic event which might cause such a failure?

A. Whatever condition would cause it. It could be anything. That if you, you know, if the feedwater line would rupture, the concern was the

damage it would cause to the aux. feed pump in the same room. When we have the pump in service, we are required to keep a man in the room that is knowledgeable in the actions that have to be taken to isolate the pump in case of a break.

Q. So the concern then is that the pipe related to the start-up feed pump may not be adequately designed or analyzed such that its failure potentially could affect the safety-related aux. feed pump that is in the room?

A. Yes, sir.

Q. Okay.

MR. LANNING: Is there --

BY MR. ROSSI:

Q. You started to say something about how long ago you were required to do that. Do you roughly remember about when? I mean --

A. At least last year sometime.

Q. So it's about a year ago?

A. At least. I don't -- I just don't have a good feel for that number.

BY MR. LANNING:

Q. If you were going to factor this event and experience you gained from this event into a

training program for the operators, is there -- which parts would you emphasize most and is there areas which you felt that you could have benefited by either additional experience, additional training or whatever?

A. I feel that the training that we have received since the Three Mile Island 2 event dealing with overheating conditions in the RCS have been adequate for the conditions I observed during this incident. We knew what had to be done. We knew what the results would be. I don't think there's anything that we could emphasize that hasn't already been done in a case like this.

Q. Or anything you would have done differently during this event?

A. I might have ordered the start-up feed pump put in service sooner. It could have been by a matter of two, three, four minutes. But, you know, it would have helped. That's about the only thing I can see.

BY MR. BELL:

Q. Was the ATOG, A.T.O.G., display in service during this transient?

A. No.

Q. Why not?
A. It just wasn't functioning.
Q. You don't -- would it be normal for that system to function? Would it not normally be done if the system were operational?
A. Its reliability has been marginal for having it available to the operators.
Q. Would you have liked that display to be in operation during that transient?
A. Yes, I would have. We all would have. We've gotten used to seeing those displays in our planning at B&W and they are quite helpful, especially in the event of this kind.
BY MR. BEARD:
Q. Point of clarification, ATOG display, is that the same as a safety parameter display system display or is that different?
A. Yes. That's your SPDS?
Q. Yes.
A. Yes.
Q. That's the same interval?
A. Same critter.
Q. I have a question with regard to -- it's along the line of T sat meters. To what extent were

the acoustic monitors on the PORV used or of benefit or not of benefit during the event as you remember it?

A. I didn't personally observe them at all. The primary operator, I believe, looked at those in relation to his operations on the PORV. Those displays are available right to his right as he -- or to his left as he was standing in front of his panel.

Q. Do you think this had -- or do you remember whether or not what he observed on the acoustic monitors for the PORV is to have, that may have inputted to his decision to use the PORV block valve?

A. I couldn't tell you.

BY MR. LANNING:

Q. When management arrived in the control room after the event, can you sort of give us some insight as to what their reactions were or comments or interactions with the operators?

BY MR. ROSSI:

Q. You might start by telling us at what point did others arrive?

A. Okay. Let me catch up to where I had left

off and will continue.

We were to the point where the plant was fairly stable. We had good control of most everything. I stood back and took a look at the emergency plan. I realized that during this transient, we were deep into the emergency plan, but there was no way that I could take time at the time to declare any kind of an event.

By the time I could stand back and look at it, we were not in any emergency action level. The one that would have been called would have been a site area emergency, which is a rather severe emergency action level.

Q. What would have triggered the site area emergency?

A. A loss of all feedwater.

BY MR. BEARD:

Q. In terms of the events, you have, I guess, an unusual event is the lowest and then you have an alert.

A. Alert.

Q. And then side emergency and then a general emergency?

A. General.

Q. So you would have been at the No. 3 out of 4?

A. Yes. Realizing that I was in that condition for a while, I felt that some declaration of some kind was warranted. Between myself and the assistant shift supervisor and the shift technical assistant, the STA, we debated back and forth for a minute.

I decided that I would declare an unusual event just as a notification process. My feeling was more just to wake people up such that if conditions would get worse for me, people would be aware of what had already occurred.

Just as I was sitting down -- I was going to sit down and write up the message that would be put onto the tape for the automatic pager -- it was right at this time when Louie Simon, the operations supervisor, arrived. His major concern was, you know, what is the plant condition and, you know, how do we stand. And, you know, he started looking at that, bringing himself up to date on the conditions.

I sat down and wrote out a message for the emergency plan notification. I gave that to the admin assistant, and she proceeded to put the

message on the tape. It was shortly after this that Steve Quennoz, the plant manager, arrived, and then Bill O'Connor, the operations engineer, arrived. And we started looking at just plant stablization, what we would have to do to put the plant in a hot standby condition.

We were a secondary site system. We had no vacuum. That had been broken because we lost all steam. For that period of time that the MSIVs were closed, we lost seals to the turbine. We lost steam to the air ejectors, and we broke vacuum just to prevent any -- it's just not good to draw cold air along the hot turbine shaft, so we broke vacuum because of that, so we had no vacuum.

When the turbine coasted to a stop, the turning gear would not engage. This had happened on the last trip. That gave me an indication of where to look. We had one electrician there, and I instructed him on the circuits to investigate. They had found blown fuses before in a sensing circuit that enabled the turning gear. I directed him to look at that.

BY MR. BELL:

Q. Zero speed circuit?

A. No, it was lift pressure. It's a circuit that observes lift pressure to the turbine bearings. And if that's available, then the turning gear will start and engage. So we were in a condition where we had no vacuum. The turbine was off gear. There wasn't much I could do at that time until I could -- I had to get the turning gear -- or the turbine on gear before I could put seals on.

I had to have seals before I could put vacuum. I had to have vacuum back before I could get the MSIVs back open. It was that kind of chain reaction, so we were stuck right where we were at. Between Bill O'Connor and Steve Quennoz, they started looking at what support we would need for the problems that we had.

They called in people from the tech section to delog the computers that would have all the transient data on it. We got extra instrument and control people in here to look at the -- well, like we had problems with the NIs, problems with the -- starting the feedwater valve control circuit.

They called in maintenance people from the maintenance shop to look at problems like controls for the aux. feedwater pumps. Well, you know, the

governor control problems we had that way. They got some engineers in there -- well, let's see. They called in the maintenance engineer.

He got other maintenance engineers in there to aid in writing work requests for the work that had to be done. It pretty well geared up the whole plant staff that way. Extra operations people were called in. They called in the day shift of operators to aid because the -- you know, I've only got five equipment operators on the shift, and we were pretty well strapped by what we had, so they called in the day shift to aid in what would have to be done just to bring the plant to a hot standby condition.

BY MR. BEARD:

Q. Hot standby? Terminology question?

A. Mode 3.

Q. Mode 3. You were in mode 2 I guess?

A. Yes.

Q. So you were wanting to go --

A. Well, we were really in mode 3 at the time, but we were sitting at 546. We had to cool down 532. There was a lot that had to be done on the secondary side of the plant in the way of the turbine seals

and the vacuum and just that kind of thing that would take people.

Q. Going back to Wayne's question about the management people, I get the flavor from what you're saying that the kinds of things th t they did appear to be very supportive --

A. Yes.

Q. -- of your running the show and getting you help?

A. Yes.

Q. Did management people give you any -- or did you perceive any reaction from the management types of their perception of the gravity of the situa[illegible]

A. They knew it was serious. The feeling I got was that they were surprised we could get it back as quick as we did. That was stated more than once. We were only for a period of --

BY MR. ROSSI:

Q. That you could get it back as quick as you could?

A. Yes, we were only in that condition for a period of twelve minutes. For having everything dead and in the water like that, the entire shift

did an excellent job. It was good efforts made by everybody.

BY MR. LANNING:

Q. So the move was to do what? Get ready to come back up to power or --

A. No, they knew that was a long way off. It was just to get us down into a normal plant configuration. We were at an in-between spot. Our normal conditions for post trip would be to come down to 532 low level limits on the steam generators.

Q. Which is hot standby?

A. Which is hot standby. We weren't there as such.

BY MR. BEARD:

Q. I don't know whether I'd be interrupting Wayne's train of thought or not, but along that same line I'd be curious as to the shift technical advisor.

A. Yes.

Q. Who was he, what did he do. Did he provide you good assistance? Was he involved in doing things for you? How did that seem to work out there during this event?

A. The fellow's name is Ted Lang. That's

L-a-n-g. He's one of our newer STAs. As it turned out, this was his first trip as an STA. He did provide some assistance in going through the emergency procedure, helping me sort out the emergency plan. He made the initial red phone call to the NRC. Provided more administrative assistance. But he was of some help.

Q. Did you feel like that the overall diagnosis of what the overall plant condition was from a global perspective, in this particular event did you do the majority of that or was it you and the assistant supervisor or how did that -- how would you describe that?

A. I think everybody that was in the control room the way of licensed operators and the STA was aware of what the conditions were. They really didn't have to be pointed out by somebody -- by one person to anybody else. We all were aware of the situation and the gravity of it.

Q. Okay.

A. Wasn't something that really had to be pointed out as such.

Q. So I guess I get the flavor that your training, especially the post TMI part of various

scenarios, well enveloped the situation. It was recognized.

A. Yes, indeed.

Q. There weren't any unusual developments that maybe the shift technical advisor was originally envisioned to help you diagnose?

A. That's true. I don't think anybody that was in there had any trouble recognizing the conditions that we were in or what it would eventually lead to.

Q. Okay. And all the actions were within, I guess, the envelope of your procedures and training?

A. Yes.

BY MR. BELL:

Q. So the --

A. The effort was all in one direction.

Q. If I may summarize both his question and your answer then, the STA really wasn't required for this event?

A. Not for the original purpose that the STA was envisioned for.

MR. BEARD: Excuse me. Did I interrupt your train of thought there, Wayne?

BY MR. LANNING:

Q. I wanted to get back to the management question. And are they generally supportive of the operations personnel? I guess I'm talking about management at the corporate level now. Like, is there a relationship there that warrants some sort of discussion or you feel has some strong feelings about it one way or the other?

A. Nothing one way or the other. They've always been supportive. Dick Crouse, the vice president of nuclear, did come in also. I can't tell you exactly what time he showed up, but he was there. He realized that he was of no real help of a technical nature, but he said he would -- he was there to give any help in obtaining resources that we might need as such. No, we had no -- no problems with support. Everybody was very supportive.

Q. Suppose this had been a more routine reactor trip?

A. It wouldn't have been nearly as involved.

Q. And management's attitude would have been what?

A. If it had been a routine trip, when we had finally stabilized out I would have called the operations engineers required. And we would have

discussed, you know, any problems that we might have had, you know. If it had been a normal trip, there wouldn't have really been any. We would have stabilized ourselves out at standby and probably stayed there until morning. People probably would have come in on day shift. I don't know if anyone would have come in in the middle of night.

BY MR. BELL:

Q. Why would you have not restarted the plant?

A. They probably would not have just because of the problems with the main feed pump. We had problems with it before, and some people were uneasy about going up with them in the condition they were in. But we did anyway. And to have it trip again just out of the blue, they would have had to, you know, do some kind of troubleshooting.

BY MR. LANNING:

Q. Now, who is some people? Did you feel personally that --

A. We would -- they would have had to get -- it would have been between like the plant manager and upper management, you know. They're the ones that will say, you know, push for getting plant on the line, make money.

Q. This is corporates you're talking about now?

A. Yes. It would have been from that standpoint. And, you know, decision would have had to have been made to bring in factory representatives from GE to, you know, troubleshoot this situation some more.

BY MR. ROSSI:

Q. Had that been done before? Had GE people come in to look at the --

A. Yes.

Q. They had been here before?

A. They were the ones that had come in and instrumented the pumps before this last start-up.

BY MR. BELL:

Q. Does it irk you that you put in trouble reports on the nuclear instrumentation system and it doesn't seem to get fixed, and you also put in -- I assume you put in trouble reports on this ATOG display, and it doesn't get fixed, does that get under your skin?

A. A little bit. It does. I mean, it's an ongoing situation. And there's -- I've been told that there's some kind of a fix being drawn up that

will correct this problem, but, you know, it's not there yet.

Q. You know, these are problems that evidently have been going on for several months. And do you feel like that people aren't responsive to the trouble reports that the operators submit?

A. Sometimes. I can't say that all the time. But, you know, this occurs again and again. They'll -- we'll declare the thing inoperable, and then if we trip and the seal comes off and they'll do ST on it and it comes back and it's good and it comes back up, then it's inoperable again. Same conditions.

BY MR. BEARD:

Q. You're referring to the NI?

A. To the NI in this case.

Q. Do you feel like that the reason you're not getting things fixed either in a timely or in a good way relates to more of management providing resources or that maybe when the technicians do get around to looking at a piece of equipment like an NI, they basically go through and do a surveillance test on it. And if it passes, they write it off versus doing really investigative troubling shooting? I'm

trying to understand where you would like to see the more improvements?

A. Well, improvements would probably have to come from the top down. You know, it's a problem that it takes an engineering fix to correct. You can't really throw it onto the technician. I mean, he -- they'll get sometimes just as frustrated as anybody else because they'll go in, they know what the problem is, and they can look at it. And it winds up the same way.

Q. So the problem is not one that they're not doing enough investigative troubleshooting for you. It's just that the --

A. A lot of times the conditions are known. They're just not fixed.

Q. Okay. Because it's beyond a repair effort that a technician would do?

A. Yes. It takes some kind of engineering fix to do it, and sometimes they're a long time coming.

BY MR. BELL:

Q. But if this were -- these problems were of a technical specification nature, that required them to be repaired before you could restart the unit or

if they weren't repaired, you'd have to shut the unit down, do you get prompt response?

A. Yes, it's no choice. It costs money when the unit is down. It costs them a lot of bucks a day. And, you know, they don't like that either. So if it comes down to it, if there's something in the road that can't be bypassed that has to be fixed, then, you know, a good effort will be made to fix it.

Q. So if we have to fix it to make it run. If we can get along without it, it's something that's nice to have in order to run, we just sort of let that slip?

A. I won't say they let it slip, but it might not have the prompt attention and response that something else might get.

BY MR. BEARD:

Q. While we're on the quick fix issue for your plant, with one start-up source range nuclear instrumentation inoperable, I guess that leaves you with a second one, are you allowed to start up in that condition?

A. No, not start up. Once you're up, they can go out of service and they're not required.

Q. One or both of them?

A. I'd have to read it to be sure, but at least one. I think both of them. You don't need source range when you're at power. Once you trip --

Q. Then you need it?

A. Then you need them.

BY MR. ROSSI:

Q. But you can't start up without both being in service?

A. You can't start up with one of them being broke.

BY MR. BEARD:

Q. I guess the last time you restarted the plant prior to this event, I get the flavor this source range channel that was on-again, off-again operability status and it happened to be operable at the time you wanted to start up, so you went up. And then apparently it died, if I can use that term, after you got out of the source range?

A. Um-hmm.

Q. Okay.

BY MR. LANNING:

Q. Had you had an opportunity to meet Mr. Crouse before this event?

A. Oh, yes.

Q. Does he visit the plant frequently?
A. Yes, he does. Comes around quite often.
Q. Just as a matter of general information gathering?
A. That and just to show the presence.
Q. Goodwill?
A. He's an old power plant man as it is, and I think he sometimes enjoys just coming out to the plant, walking around, talking to the operators.
Q. Now, that sort of implies there's a good relationship between labor and management. Is that true?
A. At least for my part. You know, I enjoy talking to Dick. He's --
Q. How about on a broader scale?
A. I don't know. Right now conditions, you know, if you're talking union people, it's kind of rocky just from negotiations that are going on, contractual-wise and such, but --
Q. Have you seen any impact of that on plant operations or with plant maintenance has to be done or --
A. Not really.
Q. Not really?

A. Not really. At least not with me. Sometimes it's personal from, you know, from shift foreman to shift foreman. Some guys get along better with people than others. It's --

BY MR. BEARD:

Q. When you're talking union people versus nonunion people, does the union include the licensed reactor operators?

A. Yes.

Q. Does the union include the supervisors of the -- the licensed supervisors of the reactor operators?

A. No.

Q. So that's the interface?

A. Yes.

BY MR. BELL:

Q. So you and the assistant shift supervisor are not union members?

A. No, we're management.

Q. You're management. Yes.

BY MR. BEARD:

Q. Have there been any particular management efforts or activities in the last few months that have been particularly troublesome to the operators

maybe with regard to maintenance or code of dress or things of this nature?

A. Yes, you've obviously heard. They are enforcing a dress code for the operators that has ruobed some fur the wrong way. They have put maintenance personnel on night shift coverage, which most of them do not like.

Q. Is it because it's shift work as a different class of work that they are objecting do?

A. They just don't like working nights.

Q. Well, I mean, are these maintenance people that we're talking about normally in the past, they'd been single shift people and they worked days?

A. Day shift.

Q. And now they're being asked to work either nights or some rotating shift kind of situation?

A. Yeah, wasn't -- well, wasn't so much as asked. They were said they will.

Q. No, I don't mean that part. I mean the part they objected to was the fact they were being asked to either work nights or rotating shifts?

A. Back shifts.

Q. Because when I was a technician many years ago, a sort of a status symbol at that time was are

you a shift worker or are you a day person. I don't know whether there's any of that kind of feel up here or not.

A. The maintenance staff and the rest of the Edison system, fossil plants, has always been strictly day shift. And they just don't like working back shifts.

BY MR. LANNING:

Q. What was the rationale for this back shift work in need of the maintenance? Was it to catch up on maintenance backlog?

A. Well, I'm told it was more for to make people available for testing, and plant maintenance type of activities on the back shift.

BY MR. BEARD:

Q. What was the idea behind the dress -- new dress code? Could you tell us what the new dress code requirements are or when they went into effect?

A. Well, like I'm wearing the uniform now that's required for the management people.

Q. How would you describe that uniform for the record? I mean --

A. It's just a dress shirt and slacks.

Q. Okay.

A. The --
BY MR. ROSSI:
Q. No color requirements or anything of that?
A. Well, yeah, I've got the dark blue pants and light blue shirt. The union people are going to have the same pants with a darker colored shirt, blue.
BY MR. BELL:
Q. Is the company furnishing these?
A. Yes.
BY MR. BEARD:
Q. No ties involved?
A. No ties. They're a safety hazard. Can't have ties around rotating equipment. But the whole thing, the reason behind the whole thing kind of rankles a lots of people because it got into just a contest between our chief executive officer and Mr. Keppler.
Q. Mr. Keppler?
BY MR. BURNS:
Q. Region 3.
A. Region 3.
BY MR. BEARD:
Q. What do you think the objective of -- I

guess you're saying --

A. The objective was that for Toledo Edison to prove it had sufficient control over its people.

Q. But you're saying the dress code for union people which would include reactor operator showroom would be the same for union people?

A. Yes.

Q. Were there other distinctive classes involved?

A. No.

Q. Did you feel like that this dress code had a adverse impact on the attitude of your reactor operators that was -- would you describe that significant or how would you describe the magnitude of the feeling?

A. Oh, it hasn't improved morale any, if you want to put it that way. Some people don't care. Some people, you know, some don't have other clothes. Some people, being ex-Navy, don't like uniforms at all. It's an individual thing. But it's just rankled a lot of feelings.

BY MR. BELL:

Q. Does the operating staff feel that the NRC has mandated these uniforms, if we may call them

uniforms?

A. I don't know if they go so far as that, but I think everybody realizes the underlying cause.

Q. And they blame the regional administrator, Keppler, for forcing this on Toledo Edison?

A. Not necessarily.

BY MR. BEARD:

Q. I got the feeling earlier that you were saying it was as a result of some sort of a contest between your chief executive officer and the regional administrator.

A. Um-hmm.

Q. I could speculate on things, but I don't think that's appropriate.

A. No.

BY MR. BELL:

Q. This is leaving the incident behind?

A. I don't have the details, and a lot of it's by rumor. I'm not going to say anymore.

BY MR. BEARD:

Q. Let me say another area. I understand you do have a union shop here, and contract renewal is coming up. And could you tell us how the -- how you stand on that with regard to possibility of strikes

and things of that nature?

A. It looks like a strike may be very probable. They're changing the health benefits, cutting the health benefits of the union personnel. It's not going over very well at all.

Q. Is the cut in effect now on the benefits?

A. Not for the union people.

Q. Or is that something that is proposed for the new contract?

A. That's what's trying to be -- that the company wants in the new contract.

Q. If they were to go out on strike -- have they had strikes here at this plant before?

A. Not at this plant. Not since the plant's gone in. Well, they've had -- they haven't had a strike of the operations personnel. They did for the office workers.

Q. Okay.

MR. ROSSI: Do you have anything more anybody?

BY MR. BEARD:

Q. I think the only thing I'd like to do is say we've asked you a tremendous amount of questions, and I think you've done a really superb job in

giving us good answers, honest answers I feel.

A. Tried to keep it straight.

Q. That's the only way to go.

MR. ROSSI: You have a good knowledge of what went on during the event.

BY MR. BEARD:

Q. I'm trying to say can we turn the table and say rather than asking us questions, is there anything that maybe we haven't touched on you'd like to convey to us of any general nature?

A. You've been pretty thorough. I can't think of anything that's happened that I feel anywhere near significant that you haven't touched. You just about covered it all.

BY MR. LANNING:

Q. Well, if anything does occur to you, next couple days, we'll be here.

A. Okay.

BY MR. BEARD:

Q. Certainly want to thank you for staying over. I realize this is at the end after a shift of working hard, and you're obviously tired, and maybe now you can go home and get some sleep.

A. I'm surprised I was as alert, to tell you

the truth.

MR. ROSSI: Let's go off the record.

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Thereupon, the interview was concluded at 11:05 o'clock a.m.

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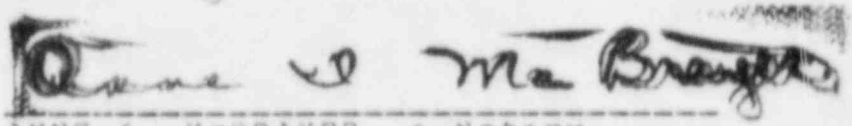
CERTIFICATE

I, Anne I. McBrayer, a Notary Public in and for the State of Ohio, do hereby certify that I took the interview of Ted Lehman and that the foregoing transcript of such proceedings is a full, true and correct transcript of my stenotypy notes as so taken.

I do further certify that I was called there in the capacity of a Court Reporter, and am not otherwise interested in this proceeding.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal of office at Columbus, Ohio, on this 14th day of June, 1985.



ANNE I. McBRAYER, a Notary Public in and for the State of Ohio.

My Commission expires February 3, 1988.

Page	Line	Correction or change and reason therefor
3	13	change "coal" to "cold".
18	20	"textbooks" should be "Tech. Specs."
28	24	"AF69" should be "AF3869"
29	1	"72" should be "AF3872".
29	1	"runs" should be "valves".
29	6	"fit in" should be "feed".
37	5	"pass" should be "path".
52	14	"blind" ??
65	7	"through" should be "to"
70	2	"INC" should be "I & C".
81	22	"side" should be "site".
83	7	???
93	10	"the seal comes off" ??
101	14	The statement I made from line 14
		of page 101 to line 3 of page 102 is
		hear-say on my part.
103	2	My statement from line 2 to line 11 is
		based on hear-say.

Page No. ____ DATE 6/20/85 SIGNATURE Teddy L. Sullivan