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NUCLEAR REGULATORY COMMISSION

TMI SPECIAL INQUIRY GROUP

INTERVIEW OF JOHN ANDERSON

PLACE: Little Rock, Arkansas

DATE: Wednesday, November 28, 1979

(THIS TRANSCRIPT WAS PREPARED FROM A TAPE RECORDING.)

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VOICE: Okay. The date is November 28, 1979. It is 10:05 a.m. We are in an office on the second floor of the administration building at ANO in Russellville, Arkansas.

Present is John Anderson, refueling coordinator and acting quality control manager at ANO for Arkansas Power & Light; also Stephen Riggs with the law firm of House, Holmes and Jewell, representing AP&L.

Present for the NRC TMI Special Inquiry Group are James Creswell and Frederick Hur.

Q Mr. Anderson, we've given you a copy of a document entitled "NRC Special Inquiry Group Witness Notification." Have you read the document?

And. VOICE: Yes, I have.

Q VOICE: Do you understand the information contained in it?

And. VOICE: I understand it and I don't think of any questions.

Q VOICE: Okay. If we could start out, you could give us a brief history of your nuclear-related experience.

And. VOICE: Let's see. The dates, it would be back about 1967 when I was assistant superintendent at our Ritchie steam electric plant, fossil unit, when I was selected as part of our nuclear program.

So I came to Little Rock for a couple years as a

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mechanical engineer at our general office, working on the nuclear program. Then I was assigned chief quality assurance coordinator for the nuclear project for AP&L. And if my memory serves me right, in early 1970 I was made what was then called plant superintendent of this plant; and served until the middle of 1978, at which time I was made the refueling coordinator there, and I've given you that.

So that's the time history. Did you have other things you wanted?

Q VOICE: I think that's satisfactory for the introduction. Jim may have some more specific questions. But I'll turn it over to Jim.

Creswell VOICE: Mr. Anderson -- Jim Creswell speaking -- could you give us an idea of what your responsibilities were as a plant superintendent?

And. VOICE: Well, it was complete charge of the plant, all the people at the site working for AP&L, involved with the plant, reported to me. So I had administrative responsibilities as well as overall site responsibilities, including some construction responsibilities. But basically, I was concerned with the plant per se.

Q VOICE: Okay. As a plant superintendent, who did you report to?

And. VOICE: I reported to -- our organization has changed in Little Rock. But I reported to our Little Rock

head office, to the director of power production, and later on to the vice president in charge of production, which was the generation and construction department, which came into being; and some intermediate titles in between there.

Q VOICE: Okay. Mr. Anderson, who specifically did you report to in the time period of say September of 1974 to the end of 1975?

And. VOICE: I reported to Bill Cavanaugh during that period.

Q VOICE: Okay, sir. Now, you mentioned before that you were a QA coordinator.

And. VOICE: Yes, for the construction of ANO-1.

Q VOICE: What were your duties as a QA coordinator?

And. VOICE: My duties consisted of the QA effort of AP&L. I was in charge of that.

Q VOICE: I see.

And. VOICE: It was a small organization. It consisted of auditing and of really -- I had some inspectors, also, who were stationed on the site. And I had site responsibility as well as off-site responsibility. I went around to the manufacturers and audited their programs, looked at their shops, reviewed all of our vendors' programs. I'm not saying I did this all personally; I was responsible for their programs, including the architect-engineer for this unit, the Bechtel Corporation.

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So my responsibility, in a nutshell, was all of the QA-type responsibilities for AP&L as in regard to the nuclear plant.

Q VOICE: Okay, sir. You mentioned that you had some responsibilities in the area of conducting audits at manufacturing facilities. Did you personally conduct or do you know of any audits that were conducted at the Babcock & Wilcox facilities, either at Lynchburg or, say, Mount Vernon in Ohio?

And. VOICE: Yes, indeed, I have. I have conducted audits at the Mount Vernon facility, and also the -- what is it, the Canton facility?

Q VOICE: Barberton?

And. VOICE: Barberton facility. And Lynchburg, the general offices, yes.

Q VOICE: During any of those audits, did you review the design or construction of the pressurizer for ANO-1?

And. VOICE: I doubt it. I doubt that I went into detailed engineering. However, I did -- in that responsibility, we reviewed -- a small staff reviewed engineering work of B&W, and in that capacity I don't remember whether I -- I do not remember whether I reviewed the pressurizer or not.

Q VOICE: Do you recollect ever observing the pressurizer during construction?

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And. VOICE: Oh, yes.

Q VOICE: You did do that?

And. VOICE: Yes, I did. The installation, you're talking about, during construction?

Q VOICE: At the plant here?

And. VOICE: Yes.

Q VOICE: Yes. I was speaking more like its -- during its fabrication.

And. VOICE: No, I don't believe that I -- I remember the steam generator as well, but I don't -- and I remember the pressure vessel (Inaudible). I mean, well, I don't remember whether I saw the pressurizer under construction or not. I don't remember.

Q VOICE: Okay. Mr. Anderson, I'm going to show you a copy of a memorandum from the Babcock & Wilcox Company dated September 6th, 1974, from a Mr. Kaylin, the site operations manager for B&W, addressed to you. I'd like for you to look at that and refresh your memory.

And. VOICE: Okay.

(Pause.)

And. VOICE: Yes, I -- my memory is refreshed.

Q VOICE: Okay, sir.

(Laughter.)

Q VOICE: In this memorandum, Mr. Caylin is pointing out that they had a test at Three Mile Island which showed

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that their pressurizer level dropped to 33 inches, as indicated by their level instrumentation. He further says that it was probably compounded -- this response was compounded by a turbine bypass valve sticking open. And he says that evaluation of data of transients from other plants, like Oconee Units 1 and 2 and Three Mile Island Unit 1, confirms that relatively low levels in the pressurizer may be reached before a transient is turned around. He further points out that the lower tap at Arkansas is 40 inches above the lower tap at TMI and Oconee 1 and 2, and that the possibility exists that the level indication will be temporarily lost during a significant reactor coolant temperature trip, pressure transient.

And he recommends that you increase the normal operating level in the pressurizer to 210 inches. And he says, if you have any questions about that, get back in touch with him.

What -- Mr. Anderson, what did you do with that memo after you got it?

And. VOICE: This memo was brought to the attention of my staff, and we had considerable interest in it. So we analyzed or we studied it. We looked at it. We did the normal things you do whenever you find something that you're immediately interested in in a plant that's starting up.

Q VOICE: Well, how did that information strike

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you, Mr. Anderson?

And. VOICE: Well, in one sense I -- what we had pushed B&W for was to be sure and let us know of things that you find at other plants. Don't stick them in your files somewhere. So, in the positive note, this was --

Q VOICE: How'd you go about that, Mr. Anderson, letting B&W know that you wanted to know about these other --

And. VOICE: Well, we had meetings with them all the time during that period and earlier, particularly earlier. And I had come from a startup of a supercritical fossil plant, and so I recognized that a lot of these things weren't getting from one customer to another of the manufacturer of, in that case boilers, in this case NSSS systems. And other people, not just me.

So we in these meetings tried to make sure that B&W knew that they needed to get this information out. I don't know if this was a result of that. I just know we did that, and from this I thought that was a positive note, to say that, yeah, we've got this concern. So that was my reaction: It was a positive thing that they had brought this to our attention.

Q VOICE: I see. Do you remember who you talked to at B&W during these meetings and expressed this concern that they provide you with information about what's going on at

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other plants?

And. VOICE: I can't name any names. That's been too long ago. But we were in like dozens and dozens of meetings, as you know, during the construction phase and the beginning of operation phase. I'm sure that any number of people at B&W were knowledgeable of our concern. But I don't have any names.

Q VOICE: Do you recollect any instances where you felt that B&W hadn't apprised you of problems that they'd picked up on other plants?

And. VOICE: Well, I can't think of any specifics at all, you know. But during the years to follow, if this is pertinent, what I think was the most important meeting that I attended was the B&W users meeting, whereby the superintendents and managers all got together. And we -- during -- I remember any number of times -- not me particularly, but others have said: Be sure and keep letting us know of these site-related problems.

I don't know if it was brought up, any specific instances where they were not. But we all recognized this thing that we've been talking about. Vendors tend to want -- or tend to not bring out, maybe, some of their troubles. I think B&W's been better than the ones I've been familiar with in (Inaudible).

So I don't know. I don't have any specifics, and

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I don't at all -- but as I say, I remember the users meeting at which this also came up with myself and various other superintendents saying, be sure and keep us informed of what others are doing.

Q VOICE: Okay, sir. Now, looking at that memo, now, you said you contacted your plant staff. Who were the types of people that you would contact over an issue like that?

And. VOICE: This would normally -- would come -- I would normally bring up something like this at -- what we had at that time was a group supervisors meeting. We had seven or eight group leaders under myself and the assistant superintendent, which covered all of the areas. And we met right along.

And also, the plant safety committee would have been given this kind of information. Probably specifically the operations manager would have been given this information.

Q VOICE: Okay. Next I'm going to show you a document here that looks like it's a routing sheet to the plant safety committee from yourself, and it has a written statement here, "Unreviewed safety question documented in PSC minutes." And the initials on here are "GHM." Could you identify who that is, please, sir?

And. VOICE: Yes. That's Gordon Harvey Miller.

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Q VOICE: Okay. Do you recall his making a comment like that?

And. VOICE: No, I don't guess I specifically remember that exact comment. I just remember the total situation. I don't remember specifically that comment.

Q VOICE: The next document I'm going to refer to is a memorandum from Gordon H. Miller, chairman of the PSC -- that's the -- the PSC is --

And. VOICE: Plant safety committee.

Q VOICE: Plant safety committee. Addressed to you. And this is dated October 2nd, 1974. And I quote from about the second page of this document. It says:

"The PSC feels this is an unreviewed safety question, since no analysis appears to have been conducted to verify that pressurizer will not go solid during a load rejection without reactor trip, thus also causing potential loss of pressurizer level indication. The PSC recommends that B&W be requested to justify the location of the low level tap at ANO based on the Three Mile Island Unit 1 and Oconee 1 and 2."

Do you recall what action was taken as a result of the plant safety committee concerns in this area?

And. VOICE: I think in generalities I remember, yes. We were -- the plant safety committee, they reported to me. And I was very concerned at the situation, because it had

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been brought up. So the actions that were taken were to try to get something moving on this, to resolve it. And we -- and I dealt with Little Rock to get them involved in this evaluation and requested -- and of course, on the site B&W was involved as well, knowing our concerns.

So yes, that was the action that was taken. We involved Little Rock and B&W in this.

Q VOICE: Okay, sir. Looking at the next document here, a memo from yourself to Mr. William Cavanaugh, dated October 15th, 1974, you state that: Considerable ANO staff review, including that of the plant safety committee, has resulted in no specific recommendation as to whether to change our pressurizer set point to 210 inches, as recommended by the referenced B&W letter. We hesitate to go to the higher setting because of the possibility of the pressurizer going solid under certain conditions. Please investigate this B&W request.

Consideration should be given to the reason that the ANO pressurizer lower tap is 40 inches higher than Three Mile Island and Oconee 1 and 2, which gives us less indication of pressurizer level. When your review is complete, I recommend the B&W request be reviewed by the SRC to determine that no unreviewed safety question exists.

Okay. Now, you've asked a question here: Why is the ANO pressurizer level lower tap 40 inches higher than

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these other plants. What was the response to that, Mr. Anderson?

And. VOICE: At that time I don't remember ever getting a satisfactory response from B&W on why that was changed.

Q VOICE: Okay, sir. What was -- you say a satisfactory one. Did you receive some comments from them?

And. VOICE: I think I asked and asked here. We all asked and Little Rock asked, and we talked back and forth. I really -- it seems to me like they may have said that -- I don't know what they said. All I remember -- you know, all I can say at this point is that they were telling me why this was.

Now, whether -- I said satisfactory. I'm sure they had, you know -- must have given some reason. But I never got a -- I never got what I call a satisfactory response to that.

Q VOICE: Does that happen to you very often, that you ask a question like that and you don't get a satisfactory response?

And. VOICE: Oh, yeah. My son in chemistry right now -- (Inaudible).

Q VOICE: Okay. I could appreciate that in your personal life. But in regards to the operation of this nuclear power plant, do you have any similar type of experiences?

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And. VOICE: I don't know. I'm sure I must have. When you've got nine jillion things, you're bound to end up with some of these type of things. Hopefully, they all get satisfactorily answered, you know, in some period of time.

I don't know whether I answered you or not.

Q VOICE: Let me ask you another question, then, Mr. Anderson. In looking through this correspondence that I have here on this subject, I see the words "unreviewed safety question" appear several times, which lends a great deal of significance to this particular issue that we're discussing.

Do you or have you customarily received unsatisfactory answers on issues of this type in the past?

And. VOICE: Well, I didn't mean to say that we had an unsatisfactory answer to the issue. It's more kind of a side question as to why it was there, you know, which really I suppose doesn't have to be answered, as long as we can -- it's shown that the parameter -- if it's no safety factor, or answered -- I don't know that we could require an answer of anybody (Inaudible) or not.

To me, while I really wanted the answer, out of curiosity and all, I was much more interested that we resolve the big picture than I was in why did you change ours differently from the earlier models in these units, you see.

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Q VOICE: But wasn't this, this question the result of a review and a decision by the plant safety committee as a body?

And. VOICE: This question of why the level tap is 40 inches higher? I believe they -- I believe -- maybe I'm not sure about that, but I remember asking the question verbally many times. I think I asked it in writing. And I believe maybe the plant safety committee did, too. Right now I can't recall that for sure, to say that that question was asked. I believe it was.

Q VOICE: Well, there is correspondence that indicates that Mr. Cavanaugh asked more than once the same question of B&W.

And. VOICE: I believe that's correct.

(Pause.)

Q VOICE: Well, B&W's made this recommendation to increase the level, and your plant safety committee has taken a look at it and they have an objection to that. They feel it's an unreviewed safety question, without any analysis.

So what's the next thing that happens?

And. VOICE: Well, the next thing that happens is, before we do anything, we get that reviewed. We get that question reviewed.

Q VOICE: And that review consists of what?

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And. VOICE: Well, that review consists of the engineering, normally now, an engineering review and a review by the plant safety committee. They review these unreviewed safety questions. So as I remember it, we asked that that be reviewed by the plant safety committee, this problem.

Q VOICE: Okay. What was the result of that review?

And. VOICE: Well, in the big picture -- I don't remember the times or the details -- the plant safety committee did review this situation.

Q VOICE: What was their determination?

And. VOICE: No unreviewed safety question.

Q VOICE: And then they submitted that to you or to your --

And. VOICE: Well, I'm a member of the safety review committee. Yes. I don't remember if they submitted it to me or I got copies of all the safety review committee meeting minutes. And I can't say that I was there and involved or whether I got the minutes or just what happened there.

Q VOICE: You don't recall whether you objected to their decision?

And. VOICE: No, I don't recall.

Q VOICE: This is all taking a little bit of time, and the plant is going through startup. What's happening

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at the plant meanwhile to address this problem?

And. VOICE: Let's see, what is happening at the plant to address this problem? I guess it was more what we talked about, sending it off and talking about it among ourselves and the staff talking about it, more than -- that's the thing, I guess, that happened.

Q VOICE: But I'm asking more to the effect, is the operator having to take any action to counteract this tendency to lose level indication?

And. VOICE: Well, during -- during our early operations, we indeed found that our pressurizer level indication did go offscale low. And so they were aware. They took -- they were aware of it and they took necessary action, being aware of this potential problem.

Q VOICE: What was that necessary action, Mr. Anderson?

And. VOICE: Well, I guess -- I think what we did was watch to see -- we watched to see that it did not get us into trouble. Now, there were some actions taken during the whole period there of time.

Q VOICE: Yes. I'm trying to understand what those actions were.

And. VOICE: All right, now. Say it again so I can go back specifically and see if I can answer.

Q VOICE: Sure.

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And. VOICE: I'm not sure I can answer, but I can try.

Q VOICE: Okay. Let me go back and restate the question. While all these reviews are taking place, there is a problem under certain conditions at the plant where you will lose pressurizer level indication. Now what I'm asking you is, specifically, was the operator given any instructions during this period of time to take any actions to deal with the problem?

And. VOICE: Well, I don't remember specific instructions that were given to do this action other than do your normal things well and keep this -- keep aware of this potential problem of going off the scale at the lower end. The things that you do, we more or less wanted to make sure we did all those things.

Q VOICE: Well, what are the things that you do?

And. VOICE: All of the things that you do during a trip, do you mean, or what?

Q VOICE: You said there are things that you do to address this particular problem. What are those things that you do?

And. VOICE: Well, one of the things you can do is start additional makeup pumps.

Q VOICE: Okay.

And. VOICE: Make sure you take your proper action on your letdown system.

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Q VOICE: That's to isolate it?

And. VOICE: Or throttle it. I don't know what the procedure is. Whatever the procedure is.

Q VOICE: Was there a procedure change made during this time period to instruct the operators to do that?

And. VOICE: I don't know whether there was or not. I meant -- you know, when I knew you were coming, I meant to find that out and look back and see. But as far as my memory goes, I can't tell you. I wasn't that involved in that much operational precision detail.

Q VOICE: But your perception is that the operators, if they had a problem, would start an additional charging pump and isolate letdown?

And. VOICE: Yeah, it needed it, and we did start additional makeup pumps on various occasions, as we tried to see the whole ramifications here in this.

Q VOICE: Okay. I'm going to show you another document now. This is from a Mr. Kaylin, who was site operations manager for B&W, directed to you, dated October 29th, 1974. And the subject is the acceptance criteria on pressurizer level. Would you take a look at that and refresh your memory?

(Pause.)

And. VOICE: Yes, I'm familiar with this.

(Pause.)

And. VOICE: I may have to refer to if there are detailed questions, because I don't -- I'm not memorizing it or anything. I'm just familiar generally.

Q VOICE: Okay, sir. Mr. Kaylin states in this memo that a recent scheduled reactor trip at ANO-1 from 40 percent full power resulted in pressurizer level varying from 180 inches to a minimum of 34 inches. He says the test procedure acceptance criteria for pressurizer level limits -- for pressurizer level limits the variation in level to 180 inches plus or minus 140 inches, which puts the level reached during the trip slightly below the minimum.

The 40-inch level is above the highest pressurizer heater bank, and is the heater power cutoff. That would infer that the level reached during the trip was sufficient to cut the highest pressurizer heater bank off, or perhaps all the heaters.

Do you -- could you comment on what the significance is of that statement, that is, that the heaters would cut off?

And. VOICE: No, I don't guess I can.

Q VOICE: Would that tend to remove the pressure control capability of the pressurizer?

And. VOICE: Yeah, I'm not really -- I would think so. I'm not really able to comment much on that. I would think so.

Q VOICE: Okay, sir.

It says: During normal pressurizer operations the level must be maintained between 40 and 320 inches indicated, for the entire system to automatically restore the design reactor coolant pressure and pressurizer level. It further states that: During reactor trip, the only requirement which should be imposed on the pressurizer is that the level remain between zero and 320 inches indicated.

He says: The location of the instrumentation is such that you ensure sufficient volume of water in the pressurizer at zero inches, and that a steam bubble will still exist when the level is at 320 inches on the high side. He says: The design of the pressurizer is such that the volume of water remaining in the pressurizer would not be sufficient to keep all the heater banks covered during the cooldown of the reactor coolant following reactor trip, but was sized to keep the lower head completely full during a reactor trip from 100 percent full power.

He says: The acceptance criteria and your test procedure should be revised to apply only to normal pressurizer system operation, and another acceptance criteria of zero to 320 inches indicated be established for a transient associated with a reactor trip.

What did you do with this memo once you received

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it?

And. VOICE: Oh, gosh. I can't remember. You know, you're asking me to remember back many years ago, and I can't. I don't know what I did with it specifically.

Q VOICE: It appears that the --

And. VOICE: I assume we -- you go ahead.

Q VOICE: It appears that the acceptance criteria was changed on the test and then you signed off on the test.

And. VOICE: I believe that -- I imagine that would be right, yes. I imagine -- what I was going to say -- I imagine what we did is -- we had a test working group during this startup and initial operation period. And what we probably did -- what we did, I imagine, was take this under consideration in the test working group and do our homework and look at it and see if we could change our acceptance criteria.

Q VOICE: So your perception is or your recollection is that the test working group approved that change?

And. VOICE: My perception is that the test working group approved that, yes.

Q VOICE: Okay. Were you relying predominantly on them to make the technical decisions as to whether the test was adequate or not?

And. VOICE: Well, on the test working group?

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Q VOICE: Yes.

And. VOICE: Well, we looked to them. We put a lot of responsibility on them. And it's not like it was unreviewed, and it's not like our operational group did not get involved, and it's not like our Little Rock group didn't get involved on this, the whole picture, the initial writing of the test procedure as well as changes.

But yes, I in the end had to sign off on these, and of course I tried to stay aware, too, and see that the proper review was given. But we did have considerable expertise on this test working group. So we -- we put considerable responsibility on them, yes.

Q VOICE: Mr. Anderson, do you recollect at any time during this review that anyone mentioned that there might possibly be some design deficiency associated with not being able to meet the acceptance criteria?

And. VOICE: I don't -- no, I don't remember that. I just know that we all, once we got to digging into this thing, we all -- I'm talking about the staff here -- we wondered, was this -- why this situation was. And we wanted to get to the bottom of it. We wanted to be assured, and we wanted to know that there was or wasn't a problem.

But no, I don't specifically remember anybody who or anybody bringing up that question.

Q VOICE: Mr. Anderson, what I'm trying to

understand, I guess, is this: Why would the test be approved if there were still these outstanding concerns and questions?

And. VOICE: Well, you know, there are -- that's what the testing program is for, I think, to see if -- you go through the tests and you analyze them and you look at them. And if the turbine generator has some problem that might not be according to the test, you analyze that and you see if indeed the original specs were wrong, or if you need to adjust those, or you need to tighten down on them. I think the same thing would hold true to an NSSS system. You go through these tests, and obviously everything you write down originally, even to how you do each one of these tests, has to be altered.

So you go through a review of all of these, and if there are adjustments that have to be made, you do the proper things to get those adjustments made, and you're aware of the significance of some of these. Some are much more significant than the others. So you just do your -- you do what your responsibility is. If you hit a brick wall, you stop right there until you get something resolved.

I don't -- I'm not sure I'm answering it, but I'm trying to.

Q VOICE: Did you have a chance to talk to

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Mr. Cavanaugh about the things in this acceptance criteria?

And. VOICE: At that time, I haven't got the slightest idea if I did or not. I just don't know. I imagine I did, but I don't know.

Q VOICE: Okay.

(Pause.)

A Q VOICE: Next I'm going to show you a memorandum, again from Mr. Gordon H. Miller, chairman of the safety review committee, to yourself, dated February 3rd, 1975, and the subject is Arkansas Nuclear One plant safety committee meeting. This meeting took place January 28th, 1975.

(Pause.)

Q VOICE: There's a statement in this memorandum under the subject of new business which states: The committee reviewed Letter NDC-2183. That would have been a piece of AP&L correspondence?

VOICE: (Inaudible).

Q VOICE: And it says: pressurizer level set point. And did not concur with loss of indication statement. Committee views this as an unreviewed safety question.

And. VOICE: I don't remember details, but generally I think I know it.

Q VOICE: Okay. Did you ever consider, during any step of this process that we've gone through in discussing

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this correspondence, at that period of time, notifying the NRC of these problems?

And. VOICE: I don't have the slightest idea. I'm sure that they were here all the time during that period, and they knew what was going on, and we talked with them. And you know, with a jillion and one problems, as you know, when you start up a plant. And it's not like you record all the conversations and whether it was documented we talked to them or not. I just don't know. But I'm pretty sure they must have been aware of this problem. They were right here with us.

I would say my guess is they knew.

Q VOICE: I'm not necessarily calling for you to have documentation that you talked with them. I'm asking you, say, did you ever call them into your office and discuss this issue with them?

And. VOICE: I don't know. I swear, I could not begin to remember that far back. I might -- no, nothing comes to mind that I can say I called them in my office and talked to them about this.

Q VOICE: Are you aware --

(Gap in recording.)

Q VOICE: Are you aware of anyone on your staff communicating these problems to the NRC?

And. VOICE: From my memory, I'm not aware if they did

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or didn't. You know, I just can't go back that far and come up with that kind of detail. I wish I could, but (Inaudible).

Q VOICE: Okay, sir. Let me ask you this: How did you normally with the NRC inspector as far as problems are concerned? Did you ever talk to them just informally about some of these problems?

And. VOICE: They interfaced in their good -- you know, their good time, as opposed to me, they came to certain meetings, I remember, you know, and were welcome. And they talked to my staff and myself. But it was more -- my interface was more like if problems came up, then they would come in and talk.

And then they always -- back then they didn't have a resident inspector, and they would come in in this period of time. Nearly all the time they were here. But they would come in when they got here and they would exit interview with me. And any problem they would have, if they would have a problem getting any information or if they would have a problem of any kind, they came in to me. And then we would talk about plant status, and that I remember.

But I cannot in any way remember whether the precise subject was brought up or not. I sure don't.

Q VOICE: Okay, sir.

And. VOICE: I'm just guessing that it certainly was.

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Everything else was. I don't know why that shouldn't have been.

(Laughter.)

And. VOICE: Whether we wanted to talk about it or not. No, we talked to them. We talked to them, had communication with them.

Q VOICE: In your opinion, in your judgment, as a standard procedure would you have discussed a matter like this with the NRC inspector?

And. VOICE: Well, there were not just this one problem, but many of them, of course, during any startup, and we were no different. And we discussed with them. But I -- there was not like at that time any checkoff sheet, even mentally a checkoff sheet: Have I told him everything? It was more that they set their pace, what they wanted to, and they went to the meetings and they went in the plant, and they looked at the record. They did things more than depending like me or some staff member telling them precisely what it was.

They, in their sense of independence, if that's the right word, and wanting to set their own pace, they wanted to say what we'll look at, so that they didn't get influenced by us to look at something while something else was going on. And they more took the initiative.

But then we did sit down occasionally and talk.

But there was no -- I had no mental checklist that I would try to keep that would say, have I told them about this problem or that problem, other than the requirements for reporting things. It was more their type initiative, I would say.

Q VOICE: Okay, sir. The next memorandum I'm going to show you is from yourself to Mr. Cavanaugh, dated February 6th, 1975. And you state: Below are comments on regard named subject, the subject being the Unit 1 pressurizer level set point, as listed by the plant safety committee. You said: I concur with the plant safety committee and -- and I'm quoting this out of context: As far as the plant safety committee is concerned, when all pressurizer level indication is lost, then there is no way to know whether the core is covered with water, and therefore a safety question exists which is unreviewed and probably not easily solved.

What do you mean by "probably not easily solved"?

And. VOICE: Well, it turned out easier than I thought. I just didn't think this might be any easy solution to this kind of -- or any easy way to define all this properly. I guess right at that time I just didn't think it would be something that could come about overnight by the waving of a wand.

And you know, during operations we like to have

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everything perfectly good, so that there's no way we can ever get in any problem. And engineering has to look at the details of can we do this kind of thing or not.

So in the process of our normal feeling of, hey, let's get -- let's make sure that everything here is totally right -- we were concerned about this. And so, specifically, it did not seem up to this point that there -- just exactly what the final resolution might be and how we could do that.

So we worked at it. We talked about it. We were concerned. We didn't right all see how that if that pressurizer dropped out below the chart, below the zero on the chart, for one instant, we didn't know where it was, you see. And at the moment we didn't realize there were other parameters that might assure us that we would be all right, which we later on began to see.

So we were just expressing our concern and that we didn't have -- we weren't able to offer anything that would wave this wand or that would get us started on a solution that would be acceptable to myself and to the plant safety committee. It looked like a tough problem at that time to finally resolve.

Q VOICE: What made it so easy to resolve?

And. VOICE: Well, we were later on shown, and after enough talking and analyzing and seeing, figuring, studying,

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we were able to see that, if we could not cool down the reactor coolant -- and I don't -- I mean, I'm talking something you probably know a lot more than I do about the whole thing -- but if we could simply not cool this, the reactor coolant inventory down rapidly, if we could keep it warmer, then it would not shrink as much and it would not disappear below the chart, the zero on the chart.

Now, we knew we had lots of level left in the pressurizer. But to an operator, when it's below the zero, you know, you just don't like to see that as an operator. So --

Q VOICE: Did your operator -- excuse me, Mr. Anderson. Did your operators complain about this, not having enough level indication?

And. VOICE: I don't remember that they complained about it. They were involved in some of the talking on this.

Q VOICE: Were they concerned about the loss of level?

And. VOICE: Oh, yes, they were concerned.

Q VOICE: It is one of the major parameters that an operator looks at during a transient, is it not?

And. VOICE: Yes.

(Pause.)

Q VOICE: Okay. The next document is a transmittal

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from Marshall L. Pendergras, secretary of the safety review committee, to the members of the safety review committee. The subject was Arkansas Nuclear One, Unit 1, safety review committee meeting minutes of March 3rd, 1975. In this document it's stated:

Follow-up action was recommended on the 28th January minutes. The plant safety committee reviewed Letter NDC-183, pressurizer level set point, and determined it to constitute an unreviewed safety question. The SRC, which is --

And. VOICE: Safety review committee, the Little Rock -- the off-site committee.

Q VOICE: -- had previously reviewed this letter and found it -- found it to not constitute an unreviewed safety question. Since there had been little communication between any plant safety committee members and safety review committee members on this matter, there was some confusion about it.

More information will be gathered and presented at the next SRC meeting.

That tends to indicate that there really wasn't a firm position on the safety review committee's part at this point in time as to whether it was a safety -- unreviewed safety question or not.

And. VOICE: I don't know. I guess what I remember

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is -- what I think I remember is that the safety review committee had said that there was no -- you know, we had asked for a review of this question. And what I remember was that they came out with the answer that there was no unreviewed safety question here.

Q VOICE: How would you have known that?

And. VOICE: Well, as I say, I was either -- I was a member of that committee, and then -- I don't say I attended all the meetings all, but I got all of their minutes, both in the normal process of sending them to the plant and as a member. So I would have gotten them in either one of two ways. Or maybe -- maybe it was that. I don't remember.

Q VOICE: Well, do you recollect whether they asked you to do anything else, or just more or less stay in that state there, where there was some confusion?

(Pause.)

And. VOICE: No, I don't remember. I don't remember. I just remember that the big picture was that they had said no unreviewed safety question in the end.

Q VOICE: Next document here, dated April 15th, 1975, from Mr. Cavanaugh to yourself, subject, Arkansas Nuclear One, pressurizer level set point. And it says: Attached is reference three from B&W, which provides their answers to PSC comments on loss of level indication in the pressurizer following reactor trip. From that letter it can

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be seen, as long as water remains in the pressurizer the core will remain covered and the high pressure injection set point will not be reached. If the pressurizer empties, high pressure injection will be automatically initiated due to the rapid pressure drop mentioned in their letter.

How did that memo strike you?

(Pause.)

And, VOICE: Well, we -- in the big picture, we were concerned that we understood and knew what would happen, and we agreed -- I don't remember how this one struck me. But we began to understand better what they were talking about as we corresponded and as we communicated with them. So it was a gradual understanding on our part of what -- I mean, we got across our concerns, I think, and they got across -- and Little Rock worked with us. And B&W finally communicated with us.

It was a growing process on all our parts, I think. And we began to get a better handle on the whole picture, the handle being that no longer on a normal trip would it -- I don't say it'll never go below zero; I'm saying that as this progressed on and as we had trips, we did not go below the zero mark in a normal trip on the pressurizer.

So it all began to come together in an understanding of what we did have here, a better

understanding.

Q VOICE: Next I'm going to read from the minutes of plant safety committee meeting that took place on April 29th, 1975. In unreviewed business, it's stated:

The committee reviewed the letter of B&W to Mr. Cavanaugh dated April 3rd, 1975, addressing pressurizer level set point per your request, Mr. Anderson's request. The letter was reviewed and committee concurs that this answers the test deficiency.

What deficiency are they referring to? Any idea?

And. VOICE: No, but I imagine it's the test that required 40 inches, that the level not go below 40 inches, I imagine. I don't know.

Q VOICE: So at this point you would be resolving the test deficiency from the reactor trip?

And. VOICE: I guess, I guess.

Q VOICE: Okay.

And. VOICE: Without researching I can't say specifically yes. But I think.

Q VOICE: And this says:

The plant safety committee feels that it's questionable that this is satisfactory for operation to allow the level to go off-scale. The only way to maintain pressurizer level on-scale is to initiate high-pressure injection upon reactor trip. Recommendation that the

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safety review committee review this, considering the high pressure to the reactor coolant system thermal sleeve design cycle limitations.

It seems to me that you and your staff are, throughout these correspondence, raising issues, raising concerns.

And. VOICE: Yes.

Q VOICE: And you're forwarding them on up into corporate headquarters.

And. VOICE: Yes.

Q VOICE: You're acting with some tenacity about this subject. You have a concern here. Over and over and over again it's demonstrated.

Do you feel that those concerns were adequately addressed?

And. VOICE: I believe they were. I think they -- well, you know, as the correspondence seems to show, we didn't back away from it. Nobody seemed to back away from it. We kept working on it and working at it, and our concerns were transmitted, and tenacity indeed was shown, and the answers were forthcoming and the proof was in the pudding of the later trips, it seems.

I don't say everything about this plant or any plant or a school bus or anything else is perfect. But yes, if you seek less than perfect, which you have to --

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nothing -- nothing is perfect. And the fact was that we -- as we went on, we began to resolve this to the plant's satisfaction.

We weren't -- we weren't willing to let it go until we -- by somebody in B&W saying, hey, we're the ultimate, we know it's all right, so you guys just take our words on it and let it go. We weren't willing to do that. So we kept our tenacity. We kept any questions we had. And we would keep referring back and trying to get the answer, until we finally got the thing resolved to our satisfaction. Whether it's perfect or not, I don't know.

Q VOICE: In July of 1975, it would appear that B&W finally did an analysis, a quite extensive analysis here, consisting of some 31 pages of text and drafts, about this subject. Do you recall what was done after this analysis was received as far as Arkansas Power & Light was concerned?

And, VOICE: No, I don't. You know, I can give you the big picture, I think. But the sequence, without a detailed study, I don't believe I can give you. I think I've answered what you asked. I'm not sure. I know we did have a considerable analysis and I know we have -- did look at the injection, as we looked at our control room and our safety valves, and we looked at all the parameters, and we did things. And just the sequence of it, I don't know.

Q VOICE: Do you recollect a visit to the site by

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Mr. Jim Finney of B&W in the spring of 1975?

And. VOICE: No.

Q VOICE: I believe it was May of 1975.

And. VOICE: I don't recollect specifically.

Q VOICE: Do you recollect ever talking to a B&W employee about that you were still considering this issue to be a significant safety concern and considering reporting it to the NRC?

And. VOICE: No, I don't. That doesn't come back to my memory right now. I'm not saying I didn't, because many gallons of water have been under the bridge. And no, I don't specifically remember -- I've talked to Jim Finney many times, you know, and I couldn't begin to separate out the time and the date you mentioned.

Q VOICE: I have a document here from Arkansas Power & Light addressed to Bechtel Power Corporation, which I assume was the architect-engineer for your project.

And. VOICE: Yes.

Q VOICE: A letter from Mr. Cavanaugh to Mr. Stoker, who was the project manager.

And. VOICE: Yes.

Q VOICE: It's dated August 5th, 1975. The subject Arkansas Nuclear One, Unit 1, pressurizer level transmitter modification. Can you -- there appears to be a string of correspondence involved with this subject. Can you give us

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your recollections of why Bechtel was contacted?

And. VOICE: I can give you the big picture, I think. As a result of looking into the situation of the pressurizer level going below zero on the chart, and recognizing that other B&W NSSS systems had a lower tap for the pressurizer level transmitter, since we looked at things that we might could do about lowering our -- or increasing our readings, lowering the lower tap, if you will, so that we could read lower.

And one of the things we considered and had Bechtel to look at was what could we do. One of the things that came up was tapping into the lower part of the surge line below the pressurizer level, the line that attaches to the lower pressurizer. And there was a possibility of connecting onto a drain there to give us an increase in level indication.

And as I remember, they were asked to look at the possibility of attaching this pressurizer level there, and they did look at this. And in the process of evaluating this, there were, I guess, two things: One is I guess we began to get a handle on the whole thing and maybe not need it: and the second thing was that, to go this route, you have to consider that on a trip the velocity out of the pressurizer through the surge line will affect -- the pressure differential between the two that makes it surge

out would affect the level indication, since the level indicator is a pressure differential device, and would make it read incorrectly to the low direction when the surge was out of the pressurizer. And as I remember it, that was the basic reason we did not go to that system there.

So we were looking at all, we thought all the possibilities that we could look at.

(Pause.)

VOICE: The last piece of correspondence that I found on this issue was dated December 10th, 1975, in a letter from Mr. Smith, the project engineer with Bechtel, to Mr. Cavanaugh. The subject was the pressurizer level transmitter modification, and it states:

During the November 20th, 1975, AP&L-Bechtel Engineering coordination meeting, we promised to submit a proposal to resolve the pressurizer level indication problem. Our proposed solution is to provide a new level transmitter, to be installed as shown on the attached figure and used in conjunction with the existing level transmitter.

And he goes on to describe the phenomenon that you've been discussing, where it can give you erroneous readings and so forth. Apparently, one of the things that you wanted to do with the level indication was determine if the B&W calculations were accurate, by actually

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measuring these changes.

And. VOICE: I forget that.

Q VOICE: What -- what was done after this? This says: Please advise if you want us to proceed with the detailed design.

And. VOICE: Well, what I remember was that it was decided not to go with this lower level tap, because of the -- you know, you can have too many indicators on your board, and if you don't trust one you're a lot worser -- worse -- "worser" -- a lot worse off than you are without it. You ought not to have it if you don't trust it. So what I remember was that I believe we just decided not to go with that.

Now, I don't remember being in -- I don't remember this, the details of how we decided or when or anything else. And I can't even swear that's why we decided that way. But that's what sticks in my mind.

Q VOICE: Is that where the issue died, roughly around the first of 1976?

And. VOICE: I wouldn't know the time frame at all. I believe that -- around the first of '76. Maybe so, pretty well.

Q VOICE: Okay. I want to change the subject now.

And. VOICE: Okay.

Q VOICE: I'd like to talk about an event that

happened, and I'm not sure when it happened. My best guess is it was 1974. It involved the failure of an EMOV. electromatic operated valve.

And. VOICE: Right.

Q VOICE: And I'd like to get your recollections of what happened during that event.

And. VOICE: Well, if it's -- I know a little bit about electromatic relief valves, since for 30 years now -- 30 years ago I first was involved with electromatic relief valve and have dealt with them through that time to one degree or another, originally doing some actual tests on them, and safety valves, too.

What I recall was that our address to the electromatic relief valve during hot functional testing -- we call for a test of that relief valve, and in the process of testing it this relief valve stuck open. And so, by the proper manipulation, we closed off the block valve ahead of this.

Of course, that's, as you know better than I do, that this electromatic relief valve is not a code safety valve, and the reason it's there is so you can close off and work on it and repair it. So that then you can open it back up and use it instead of your code valves.

Well, anyhow, this failed open. So we closed off the block va ve, and then we worked on it, and I think we

found that the pilot -- this thing isn't -- well, you know how they work. This has a pilot on it, and the pilot discharges somewhere, and it discharged in, essentially into the quench tank, into the line from the safety valves and this valve that goes to the quench tank.

Anyhow, we found that it went into there. So that was changed to go to the reactor building atmosphere, the pilot valve and the discharge line. And that's all -- that's what comes to mind. But I'm not sure that's either what you had in mind.

Q VOICE: Do you have any idea when the event actually happened?

And. VOICE: During hot functional testing is the only time, as I recall, it happened, before we ever went critical.

Q VOICE: Okay. Now, it appears that the design change that was made to reroute the vent from the pilot was made in September, around September 16th of 1974, which is after you went critical and started power ascension testing.

And. VOICE: Uh-hmm.

Q VOICE: Now, what was the condition of the valve since it had failed in hot functional testing until it was repaired?

And. VOICE: I don't know whether we had that block valve closed off there or not. I assume we did.

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Q VOICE: Did the plant safety committee review that decision to do that?

And. VOICE: I just don't -- I just don't know. I don't know. It would not take that. It would not take their review in a situation like that.

Q VOICE: Okay. Is there anything else you could tell us about that event that you recall?

And. VOICE: No.

Q VOICE: The impact on the operators when it happened, or anything that happened in the plant? Any other equipment damage that happened?

And. VOICE: Not that I recall. Not that I recall.

Q VOICE: Do you remember whether the test that -- when the valve failed, were the tests worked out satisfactory, satisfactorily?

And. VOICE: I haven't thought about that since it happened and I could not begin to tell you without some research. I'm sure it did. In the process of doing our tests, we looked at all the tests and got them all properyly signed off.

Q VOICE: Before you into initial criticality and power operation, you should have, what, test deficiencies like that cleared up?

And. VOICE: Well, I don't know about ones like that or not. That's not a code safety valve. It's like excess --

not excess value; that's not a true statement. It's a desirable -- it's a desirable feature rather than any required feature.

So I doubt that we would have required that something like that -- you know, it's like something on the secondary system that you can do without, maybe. That may not be a good comparison. But it's something that you can do without. So I don't think that we would require that to be signed off, finished, before we went critical.

VOICE: Well, we've been looking at the test documentation for that test and we can't find the records in there where the valve failed. Maybe we haven't looked at it close enough.

And. VOICE: You know more than I do about it. It's been a long time ago.

VOICE: Okay. At this point I'm going to turn it back to Fred and see if he has further questions.

Hess VOICE: Let me ask one question. We talked a lot about the plant safety committee and the safety review committee. Would you tell me what is the plant safety committee, what are its responsibilities, and what is the safety review committee and what are its responsibilities, and how they relate?

And. VOICE: Well, that's a long speech there. But generally, the safety review committee, the off-site

committee, is composed of individuals who cover the spectra of the things you do at a nuclear plant, and it is a big review committee that does audits and looks at records, the necessary records, and who is interested that the safety -- that the whole -- everybody involved with the company and with anything else, anybody else that's here, that they consider safety as a prime factor. And with this expertise, they're able to look at the whole coverage of things that they're chartered with.

And they, for instance, look at certain procedures, and they look at potential unreviewed safety questions. They are the assurance in the setup that says the plant is operated according to all the standards and the codes and is operated safety, and isn't bypassing these things and isn't in trouble because their QCR organization is not functioning or functioning wrongly, or their operating group doesn't have the training, or something like that.

So that's the safety review committee. But of course, we have in our tech specs the specific requirements of what they do and the details and the way they operate. And we have had a charter and have one now, which defines precisely what they do. And they look at -- well, for instance, they look at the minutes of the plant safety committee.

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And there's always been one or two or three members of he plant safety committee on ihe safety review committee. So they communicate in that way and by the other ways of correspondence and by their coming up here periodically.

Now, the plant safety committee is concerned with, again there, they're whole -- all of their requirements are in technical specifications, and what they do and how they do it. And they -- that group consists of knowledgeable individuals, again, in the fields that the plant deals with -- health physics and operations and the various phases of management and all.

And they're charged with responsibilities of looking also at any unreviewed safety questions, looking at procedures, at special, for instance, work plans that come up. So that we are sure that, from the plant -- well, from the plant as well as other places -- we are sure that things are done according to our tech specs and codes and standards, and they're done safely. And a lot of things you come across, like in the work plan, you know, it could say, repair the -- let's say, make it, repair the code safety on the pressurizer or something. And in their revi they'll make sure that the proper conditions are there and that the plant safety is not lowered and it's done at the right time and all of that.

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So they look at special problems submitted by the plant manager, at his request.

Q VOICE: Is it fair to say that both groups basically perform the same function, but maybe the plant safety commission -- committee -- performs it on a more detailed level than the safety review committee, and the safety review committee is an overview committee on a corporate level?

And. VOICE: They do that, yes. But the safety review committee looks at a lot bigger -- the safety review committee looks at all the things that are not just on-site. But generally speaking, the plant safety committee looks at things on-site in detail, whereas the corporate-level off-site committee, one of their functions is to look at the plant safety committee to see that it is performing. But they look at things off-site and they --

Security is a good example. The plant safety committee does not look normally at like industrial safety or so much at security. But the safety review committee off-site is charged with enough audit to see that security is performed properly, an audit function. The plant safety committee does not audit security.

Q VOICE: Okay. I have no more detailed questions. I guess if you have anything you would like to state, any comments you'd care to make, we appreciate them at this

time.

VOICE: I don't think of anything, except to say that we hope that we have cooperated to the best of our knowledge. A lot of detail, I have to confess, I just don't remember. I could look up perhaps some of it and get it if I had to. But I hope that's not interpreted to mean that we weren't to -- I wasn't trying to remember, because I was. And so in my case, in our case, we're trying to cooperate with you and give you what you want, and we hope you get it.

VOICE: We certainly appreciate that, and I think we recognize it was a long time ago. We're asking you about some specific things many years ago.

With that, it's now 11:35 and we'll terminate the interview. We thank you very much for your time and your effort you put forth this morning.

VOICE: Thank you.

(End of recording.)