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UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK

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GENERAL PUBLIC UTILITIES CORPORATION, :  
JERSEY CENTRAL POWER & LIGHT COMPANY, :  
METROPOLITAN EDISON COMPANY and :  
PENNSYLVANIA ELECTRIC COMPANY, :

Plaintiffs, : 80 CIV. 1683  
: (R.O.)

-against-

THE BABCOCK & WILCOX COMPANY and :  
J. RAY McDERMOTT & CO., INC., :

Defendants. :

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Continued deposition of GPU Nuclear Corporation, by GARY P. MILLER, taken by Defendants, pursuant to adjournment, at the offices of Davis Polk & Wardwell, One Chase Manhattan Plaza, New York, New York, on Monday, June 7, 1982 at 9:40 o'clock in the forenoon, before Joseph R. Danyo, a Shorthand Reporter and Notary Public within and for the State of New York.

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of Counsel

## Also Present:

NINA RUFFINI

-oOo-

2 G A R Y P. M I L L E R, having  
3 been previously duly sworn, resumed and was  
4 examined and testified further as follows:

5 EXAMINATION (continued)

6 BY MR. WISE:

7 Q When we stopped on Friday, I believe we  
8 were discussing the loss of reactor coolant/reactor  
9 coolant system pressure emergency procedure for  
10 TMI-2, a copy of that being marked B&W 272, and I  
11 believe you have a copy of that in front of you.

12 A Yes.

13 Q Let me ask you whether as a result of  
14 either your training on your TMI-1 license or in your  
15 position as superintendent for Unit 2, you came to  
16 have any understanding of the degree of familiarity  
17 operators were expected to have with the follow-up  
18 actions contained in the various emergency procedures  
19 for TMI-1 and TMI-2.

20 MR. SELTZER: Yes or no.

21 A The degree of familiarity from my  
22 training would have been to be able to perform all  
23 those actions with the procedure out and with  
24 someone reading it to you. Not the familiarity with  
25 the symptoms, with the memorization required by the

1  
2 immediate manual action.

3 Q Let me see if I understand. These  
4 procedures, the emergency procedures, at least the  
5 two we have been looking at, the pressurizer system  
6 failure procedure and the loss of reactor coolant  
7 procedure seem to have somewhat the same format.  
8 They begin with a section on symptoms and then they  
9 have a section on immediate action, and then a section  
10 on follow-up action.

11 Is it your understanding that that was  
12 the general format used for the emergency procedures  
13 at TMI-2?

14 A Yes.

15 Q Do I understand you to be saying that  
16 operators were required to have general  
17 familiarity with the symptoms part of each of these  
18 emergency procedures or not?

19 A I think I have stated before in this  
20 deposition that the one most important thing is the  
21 operator must memorize the immediate manual action.  
22 The symptoms portion I would say required very high  
23 degree of familiarity, and I said once before that I  
24 stopped short of memorization because there could be  
25 two to three hundred symptoms, a very high degree of

1  
2 . familiarity with the symptoms.

3 Q What about the third section, the  
4 follow-up action section in each of these  
5 procedures, to what extent were operators expected  
6 to be familiar with the follow-up actions?

7 MR. SELTZER: Let me ask you to go back  
8 and read Mr. Miller's answer to the first  
9 question, which I think gave a precise  
10 response to this most recent question.

11 (Record read)

12 MR. WISE: After rereading Mr. Miller's  
13 answer to the first question, I think I am  
14 still left with just a slight confusion, and  
15 let me see if I can clear it up.

16 Q Let's concentrate on just the follow-up  
17 action. How were operators, as you understood it,  
18 to use the follow-up actions in the emergency  
19 procedures?

20 A I think I answered that in the first  
21 question, and what I mean is that they would have  
22 that procedure out or a combination of procedures,  
23 and they would be read to them, and then they would  
24 perform those actions, and they would be familiar  
25 enough with the plant from their training experience

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to be able to capably perform those actions.

Q Were operators required, to your knowledge, at any point during their training to read through the entire set of follow-up actions on each of the emergency procedures at some point during their training?

A Yes, and in their retraining and in their simulator sessions.

Q To your understanding, was an operator supposed to be familiar, at least in the sense of having read it and knowing generally what is in it, with the entire set of follow-up actions contained in any of the emergency procedures?

MR. SELTZER: I object. That has been asked. He just answered it. He said their training would go through all the follow-up procedures.

MR. WISE: I think we have established they were supposed to be trained on it. I am now asking whether as a result of that training it was his expectation that the operators would be generally familiar with the entire set of follow-up actions.

A It may be that I have used these

Miller

1  
2 procedures, and therefore I am assuming when I give  
3 you the answer that you understand it, and therefore  
4 maybe I am redundant. I really think I have  
5 answered it.

6 I think I ought to say one more thing.  
7 Some of these procedures take you all the way to a  
8 plant condition which could be two days later, a day  
9 later, a shift later. It is not so important that  
10 the operator be familiar with all the steps that you  
11 go through to get to that condition. That is why  
12 the thrust and emphasis is on immediate manual  
13 action and symptoms.

14 So the answer to your question is yes,  
15 they have to be very familiar with it, but their  
16 awareness of what the plant is going to do eight or  
17 16 hours from now is not as important as what is  
18 happening now, because there is time to get the  
19 procedure out and to methodically follow it.

20 Q Let me ask you this question. We  
21 discussed last week the two different sections of  
22 the loss of coolant/reactor coolant system pressure  
23 procedure. There is section A, which is titled  
24 "Leak or Rupture Within the Capability of System  
25 Operation," and section B, which is entitled "Leak

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2 or Rupture of Significant Size Such That Engineered  
3 Safety Features Systems Are Automatically  
4 Initiated."

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I want to come back to section A for a  
moment. I believe you testified that you believe  
that section A covered leaks or ruptures even if HPI  
had been or was initiated during the course of the  
event. Is that right?

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A That's right.

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Q Isn't it a fact that section A is  
intended to cover only those events in which the HPI  
setpoint of 1640 psig is not reached?

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A I think that you have to remember this  
procedure is written for a loss of coolant accident.  
The operator has made that recognition. I can't  
talk unrelated to the events of March 28, when the  
operator had HPI initiation, as we discussed, and I  
misstated it was automatic. He went to this  
procedure and he looked to see whether or not he  
should be in the procedure and where he should be in  
it and whether it applied.

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The operator determined that he was in  
section A. He further determined that he was  
throttling high-pressure injection to maintain

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2 pressurizer level, and he did not determine that he  
3 had a loss of coolant accident.

4 MR. WISE: If the reporter could go back  
5 and read my question, I would like an answer  
6 to that one.

7 (Record read)

8 A I feel I have answered it. I will try  
9 and be more concise.

10 The procedure is written for a loss of  
11 coolant accident. The operator did not determine he  
12 had a loss of coolant accident. He had an KPI  
13 initiation. He reviewed this procedure, and he  
14 determined his actions.

15 Q We may be missing each other. I am not  
16 asking you anything about what happened on March 28,  
17 1979. We will have questions on that later. I  
18 believe the operators have been deposed as well.

19 I would like once again to pose the  
20 question, and it is directed at your knowledge as  
21 station superintendent or unit superintendent for  
22 TMI-2.

23 MR. WISE: Could the reporter read the  
24 question once again, and I would like it  
25 reprinted in the record at this point so that

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the reader can see what the question is.

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MR. SELTZER: Just as a clarification, are you asking for an event that is a loss of coolant accident, can you be in section A, if pressure has fallen below 1640 psig?

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MR. WISE: This procedure is labeled "Loss of Reactor Coolant/Reactor Coolant System Pressure." It covers on the face of it both loss of coolant accidents and situations in which pressure has been lost.

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My question is a simple one and I don't know why it is taking so long to get an answer. I am asking a very straightforward, simple question to the man who was Unit 2 superintendent and oversaw the preparation of these procedures.

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MR. SELTZER: Why do we have to go through these preambles? Why don't you just ask the question? But I would appreciate if you could clarify the point which I was raising, which might have been confusion between you and the witness.

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He is interjecting something about whether or not somebody recognized that they

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2 had a leak or rupture. I thought it might  
3 get to your point if you say, "I want you to  
4 assume there is a leak or rupture, could you  
5 be in section A if you had less than 1640?"  
6 But if that is not your question, we ought to  
7 proceed.

8 MR. WISE: It is really not my question.

9 I would like the reporter to reread the  
10 question that we have been trying to get an  
11 answer to for the last several minutes and  
12 let's see how we do once again with Mr.  
13 Miller.

14 MR. SELTZER: If that is not your  
15 question, then I am very confused and I am not  
16 sure the question is as simple and obvious as  
17 you think it is. I don't understand it at all.

18 MR. WISE: Could we have it reread?

19 (Question read as follows:

20 "Isn't it a fact that section A is  
21 intended to cover only those events in which  
22 the HPI setpoint of 1640 psig is not  
23 reached?")

24 A Attempting to give a responsive answer  
25 and not relating this to the events of the accident,

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section A, and now going back to my own training and experience at the time of the accident, section A clearly says in section 325 that if pressurizer level and RCS pressure are above the setpoints, you go on and do a cooldown of the plant, both, together, twins. If they are not, if pressurizer level can't be maintained and RCS can't be above that setpoint, then you have a major casualty.

With a leak that is not in the capability of the system, you go to section B, and that is the best answer I can give to your question.

BY MR. WISE:

Q Do you recall at any time becoming aware of any need to revise the loss of reactor coolant/ reactor coolant system pressure emergency procedure with respect to certain sizes of small breaks?

A Yes, at some point in time we did have to make such revision.

Q That was before the March 1979 TMI accident, was it not?

A Yes.

Q Do you know what size of breaks were considered in connection with those revisions?

A The term I remember is "small break

2 LOCA." I can't say that I know which spectrum  
3 size that involves. I can guess, but I would have  
4 at the time seen the correspondence.

5 Q It was certainly something smaller than  
6 a double-ended pipe break?

7 A I believe so.

8 Q Do you know whether revisions were made  
9 to the procedures to take into account that small  
10 break LOCA analysis?

11 A To my knowledge, they are in the  
12 procedure that we have.

13 Q Were you aware of that as Unit 2  
14 superintendent, that is, that those revisions were  
15 being made?

16 A I was aware the revisions were required.  
17 I don't believe I was exactly aware where they were  
18 put in the procedure at the time.

19 Q You recognize now that they are part of  
20 section B, do you not?

21 A Yes, I do.

22 Q That is the section that covers leaks  
23 or ruptures of significant size such that engineered  
24 safety features systems are automatically initiated,  
25 right?

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A Yes.

Q Do you know whether operators were trained at the time these revisions were made, that is, trained on the revisions?

A To the best of my -- scratch that.

Yes, they were trained, and in fact, when these arrived at the site, they arrived with an immediate implementation requirement, and for a portion of time, I believe there was even a set of instructions temporarily posted in the control room, and on a weekly basis we had to actually demonstrate memorization of the ten minutes of action.

Q Were there time limits associated with the revised procedure as you understood it?

A Basically, the same time limits that I remember with the initial change which I think came in for Unit 1 initially applied to both units.

Q So to the best of your knowledge, before March 1979, operators had been trained concerning small breaks and the required responses under section B of the LOCA/loss of pressure procedure?

A Yes.

Q Let me ask you to go back to section A

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of the procedure.

Did there come a time that you can recall when there was discussion within Met Ed of problems concerning the follow-up actions provided in section A of the LOCA procedure? This is before the accident.

A In Unit 2 or 1?

Q Unit 2.

A I can't specifically remember a problem, no.

Q Let me ask you to take a look at section 3.2.2 of the part A of the LOCA procedure. That is one of the follow-up actions?

A Yes.

Q It reads, "Bypass the safety injection by depressing the group reset pushbuttons and throttle MU-V16A/B/C/D as necessary to maintain 220 inches pressurizer level and not exceed 250 gallons per minute per HPI flow leg."

Directing your attention to that specific step, are you able to recall discussion within Met Ed about the clarity of that particular step and the appropriateness of it?

A I can't today remember those discussions.

MR. WISE: Let me have marked as B&W

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Exhibit 769 a memorandum dated April 14, 1977 from you to Mr. Herbein. The subject is "TMI Unit 2 Post-actuation Bypass and Defeat of Auto Initiated ESF."

(Memorandum dated April 14, 1977 from Mr. Miller to Mr. Herbein marked B&W Exhibit 769 for identification, as of this date.)

Q Have you had a chance to read this?

A Yes.

Q I would like you to look at the LOCA procedure, and specifically part B, section 3.4.

Do you have that?

A Yes, 3.4.

Q This is the part of the procedure that deals with automatic initiation of ESF systems. 3.4 reads, "Defeat any two channels of reactor" --

MR. SELTZER: You said this refers to automatic action? It is in the section on "Follow-up Action".

MR. WISE: Automatic initiation of ESF, part B.

Q Section 3.4, which is part of the follow-up actions to that part of the procedure, states, "Defeat any two channels of reactor building

1  
2 isolation and cooling, then bypass all three safety  
3 injection channels."

4 Do you see that?

5 A Yes.

6 Q Am I correct that your memorandum of  
7 April 14, 1977 to Mr. Herbein was directed  
8 specifically to section 3.4?

9 A I think that my memorandum is applicable  
10 to 3.4, but my memorandum is really meant to say that  
11 the Burns & Roe design portion should not differ in  
12 its philosophy from the B&W portion of the system.

13 Q Let me read you the first paragraph of  
14 the memorandum. It says, "Recently, there has been  
15 discussion on the subject of operator action  
16 relative to the automatic actuation of reactor  
17 building cooling and isolation and subsequent defeat  
18 of the actuation signal. Met Ed has been requested  
19 to change the necessary philosophy, training, and  
20 procedures to incorporate the present system design.  
21 The TMI Unit 2 staff would appreciate further  
22 discussion of this item before a final position is  
23 reached."

24 That is the opening paragraph.

25 To your knowledge, who had made the

1  
2 request to Met Ed to change the philosophy,  
3 training, and procedures on this subject?

4 MR. SELTZER: The decision?

5 MR. WISE: Who made the request?

6 A I can't remember the specific issue, but  
7 if you read the memo further, it indicates there was  
8 a field questionnaire. It would be my judgment  
9 today that that probably meant that Burns & Roe  
10 didn't view this as an item that they wanted to  
11 make a design change for.

12 Q Getting back to your first paragraph, in  
13 what ways did you understand someone was wanting to  
14 have the philosophy, training and procedures  
15 changed with respect to this item, that is, the  
16 bypass and defeat of auto-initiated engineered  
17 safety features?

18 A I think it is important to put this in  
19 context. We are talking about one Burns & Roe item  
20 in this system, which is the reactor building  
21 cooling, only, part of this system. Not applicable  
22 to any of the stuff we have been talking about in  
23 the primary plant.

24 The second paragraph tells you this, that  
25 in one sentence or less it wasn't normal to us to

2 have ES equipment turned off when you defeated the  
3 system or bypassed the system. The ES philosophy  
4 was that you bypassed the system, that you had to  
5 manually turn off equipment, manually stop the  
6 function. That was a method of operation which we  
7 established. That is the portion I believe I am  
8 referring to. The original design of this reactor  
9 building cooling system didn't meet that.

10 Q I just want to make sure that the record  
11 is clear.

12 When you talk of defeating the ES  
13 system, you simply mean that the operator bypasses  
14 the automatic aspects of the system, but that the  
15 pumps or whatever it is that have actuated continue  
16 to operate, is that right?

17 A That's right, but I want to clarify that.  
18 On the primary plant portion which we have been  
19 discussing up to now, I think you actually have the  
20 title "bypass." You bypass the signal, and  
21 therefore you gain manual control. The reactor  
22 building isolation system, if I remember properly,  
23 has a defeat button on it, so the word "defeat"  
24 comes into play because of the system design, but  
25 yes, you defeat the signal. You then gain manual

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access to the system.

MR. SELTZER: So is defeating the signal the same as manual bypass?

THE WITNESS: I think it is, in my mind.

Q This memo was meant to cover both, right?

A Yes.

Q Bypasses and defeats?

A And more than just the HPI system.

Q Yes. It also covered the reactor building isolation?

A Yes.

Q But as I understand it, what this is about is that the philosophy and training and procedures as you understood them were designed to allow the operator to take manual control of the equipment without necessarily shutting the equipment off?

MR. SELTZER: The original design? The design as it existed before April 14?

MR. WISE: The original philosophy, training, and procedures which Mr. Miller did not want to have changed basically held that the operator could take manual control without

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turning the pumps or other ESF equipment that had been actuated off?

MR. SELTZER: Are you talking about the whole ESF system or are you talking about the reactor building cooling system?

MR. WISE: Any of the ESF features.

MR. SELTZER: I note he just told you the reactor building cooling system had a different design from the rest of the ESF.

MR. WISE: Let's try to take it in smaller pieces.

MR. SELTZER: Can you discuss ESF without reactor building cooling system?

BY MR. WISE:

Q As I understand the TMI-2 ESF system, there are certain setpoints that cause the engineered safety features to come on automatically, right?

A Yes.

Q Once they have come on, they continue to run until they are defeated or bypassed, is that right?

A Until they are defeated and bypassed and then operator action was taken.

Q Isn't it true that Burns & Roe had

2 designed the electrical equipment and control  
3 equipment in a way that in order to take manual  
4 control once an ESF system had actuated, it would  
5 be necessary to not only defeat the emergency  
6 signal, but to actually turn the engineered safety  
7 equipment off in the course of defeating that  
8 signal? Is that what this is about?

9 A The short answer is yes, but I want to  
10 say one other clarifying thing. It only involves  
11 two or four components. They designed the whole  
12 building isolation system in accordance with our  
13 philosophy. They took four components out of a  
14 hundred or 200 and had them automatically turning  
15 off upon signal defeat, and I disagreed with that,  
16 but in context, that is a small portion of the  
17 system.

18 Q The only thing I want to get at now is  
19 that you felt that with respect to that small  
20 portion and those few components, they were doing  
21 something that conflicted with the philosophy,  
22 training, and procedures as established at Met Ed?

23 A Yes.

24 Q That is why you wrote this memo?

25 A Yes.

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Q What did you feel that philosophy, training, and procedures were? In other words, why did you feel that what Burns & Roe was proposing with respect to those few components was at variance from what you understood the philosophy, training, and procedures to be?

A I have a problem in that I think we have been discussing that now for about ten minutes, and I think I have answered.

MR. SELTZER: I think that is a fair statement.

Q Just humor me a little bit.

What did you understand the Burns & Roe design was going to do violence to?

A I didn't mean that to be funny, and I mean that.

It would do violence to what I have just been discussing. I don't like the word "violence." It would run against all the other equipment in that system in that it would automatically turn off upon defeat or bypass, and I disagreed with that.

Q So is it true that the philosophy, training, and procedures at Met Ed as you understood them in April 1977 were to the effect that simply

2 bypassing the emergency safeguards signal should  
3 not be an occasion for turning off the equipment or  
4 the associated equipment?

5 MR. SELTZER: When you say "should not  
6 be an occasion for," you mean should not cause  
7 the equipment to go off?

8 MR. WISE: Yes.

9 A I in no way said that. I said very  
10 simply that I disagreed with the component being  
11 automatically secured upon defeat or bypass. The  
12 whole reason for defeat or bypass was to gain manual  
13 control and take operator action based on training  
14 and experience, not have to return equipment on  
15 and reset it again.

16 Q Let me ask you to look at the last  
17 paragraph on the first page of your memorandum. It  
18 reads, "The whole issue of operator action  
19 immediately after the LOCA is a sensitive and, to  
20 some, a confusing area. ANSI 660, entitled 'Operator  
21 Action' causes most of the confusion. That document  
22 is addressed to the designer" -- underscored -- "and  
23 instructs him to make the design so that the operator  
24 does not need" -- underscored -- "to do anything for  
25 'X' number of minutes. It does not prevent" --

2 underscored -- "the operator from interposing  
3 himself in the control system to mitigate the  
4 consequences of the accident even further. Neither  
5 the NRC or any logical designer would tie the  
6 operator's hands so he can do nothing. The operator  
7 must be free to correct deficiencies, free from the  
8 standpoint of mental process -- hence ANSI 660,  
9 and free from the hardware standpoint -- hence, the  
10 unit has the postactuation 'bypasses' and 'defeats.'"

11 Why did you believe that the issue of  
12 operator action following a LOCA was a confusing  
13 area?

14 MR. SELTZER: Objection. It says to  
15 some it is a confusing area. It doesn't say  
16 Mr. Miller believed it was confusing.

17 Q Why did you believe that it was a  
18 confusing area to some?

19 A Since you read the whole paragraph in  
20 the record, I think I should tell you I no longer  
21 have a good familiarity with ANSI 660. I think my  
22 sentence has to be looked at in its entirety. It  
23 is sensitive and confusing to some, because any  
24 operator, reading 660 and knowing how we were  
25 trained, sensitive because it is important,

2 confusing because I think 660 tended to be, from my  
3 statements, tended to be thrust towards no operator  
4 action, and that had not been the way the industry  
5 had focused.

6 Q ANSI 660 refers to the American National  
7 Standards Institute?

8 A I am sure it does.

9 Q One of their published standards  
10 numbered 660?

11 A Sent to the designer.

12 Q Was it your understanding that operators  
13 read ANSI 660 as part of their training?

14 A I am not sure from my paragraph here I  
15 am talking about operators as much as I am talking  
16 about supervision like myself and Mr. Herbein and  
17 Mr. Colitz, who would have been reading 660, who  
18 would have known the training and philosophy, and  
19 that would be the meaning of that sentence, I  
20 believe.

21 Q Your counsel objected when I asked you  
22 whether you thought it was a confusing area,  
23 because the sentence says "to some a confusing  
24 area."

25 Was it a confusing area to you, the

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question of operator action immediately after a  
LOCA?

A I think I answered that. I don't  
believe it was a confusing area to me, but I think I  
said that 660, along with our current training and  
philosophy, I think my thrust of thinking was that  
could be confusing.

Q To whom?

A To me and an operator. If you take 660  
and you had no operator action after an event, the  
whole industry was trained in performance of  
operator action after an event.

Q Was it your belief at the time that an  
operator should be free immediately after a LOCA  
to take action?

A In the last sentence of that paragraph  
you read into the record, I said the operator must  
be free to correct deficiencies. The reason I felt  
that way --

MR. SELTZER: You don't have to go on  
and give him explanations.

A I will stop there.

MR. SELTZER: We will probably be here  
long days and just to finish by Thursday --

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2 Q Was it your belief in April 1977 that  
3 no logical designer would tie the operator's hands  
4 so that he can do nothing immediately following a  
5 LOCA?

6 A That was my belief, and that was based on  
7 the current standard design of the systems.

8 Q And based upon your experience as an  
9 operator?

10 A Based upon my experience as an operator  
11 and knowledge of the design.

12 (Recess taken)

13 BY MR. WISE:

14 Q We have discussed the pressurizer system  
15 failure, and we have discussed the loss of coolant  
16 procedure. Let me ask you a couple of questions.

17 Was it believed during the course of  
18 preparation of emergency procedures for TMI-2 that  
19 a loss of reactor coolant system pressure was a  
20 casualty?

21 A Yes, among other symptoms.

22 Q I am not talking about it as a symptom  
23 now. I am talking about whether the fact that  
24 reactor coolant system pressure was lost constituted  
25 a casualty in the minds of those like yourself who

1

2 were working on developing a set of emergency  
3 procedures for TMI-2.

4 MR. SELTZER: Are you asking whether the  
5 loss of pressure was considered by them at the  
6 time procedures were being drafted as a  
7 separate casualty?

8 MR. WISE: Yes.

9 A Reactor coolant system pressure is a  
10 very important parameter, and it was considered in  
11 the generation of the emergency procedures and other  
12 procedures.

13 MR. SELTZER: I don't think that is  
14 answering his question. If you just had a  
15 loss of pressure, did you think of that as a  
16 casualty at the time you were drafting  
17 procedures?

18 THE WITNESS: The answer is yes, and you  
19 should understand why you had the loss of  
20 pressure.

21 Q To your knowledge, before the TMI-2  
22 accident, were operators trained to treat loss of  
23 pressure as a casualty condition?

24 A The answer is yes, and the operator  
25 would have been expected to gain an understanding

2 for the reason for the loss of pressure.

3 Q And the emergency procedure that covers  
4 that particular casualty, that is, a loss of  
5 pressure, is the loss of reactor coolant/reactor  
6 coolant system pressure emergency procedure which  
7 we have marked as B&W 272, is that right?

8 A That's right, if the operator determined  
9 he had a loss of coolant accident.

10 Q What if he only determined he had a  
11 loss of reactor coolant system pressure? What  
12 emergency procedure was he to go to then?

13 A That would be dependent on the plant  
14 situation, and I mean by that, he could be in the  
15 pressurizer failure procedure. He could be in the  
16 reactor trip procedure. In other words, he would  
17 have to utilize more than one symptom and more than  
18 one procedure.

19 Q Besides the reactor trip procedure and  
20 the pressurizer failure procedure, are you aware of  
21 any other emergency procedures at TMI-2 where an  
22 operator was supposed to go to treat the casualty  
23 loss of reactor coolant system pressure?

24 I should add also the loss of reactor  
25 coolant/reactor coolant system pressure procedure

1  
2 itself.

3 Taking those three we just named, were there  
4 any others where an operator was supposed to go?

5 A Without having an index of the procedures  
6 in front of me, I could maybe think that there might  
7 be, depending on conditions, possibly station  
8 blackout, and that is about all I can arrive at.

9 Q Did you ever take a look at the B&W-  
10 submitted draft procedure for TMI-1 that covered loss  
11 of reactor coolant/reactor coolant system pressure?

12 A I don't believe I did look at the Unit 1  
13 submission. It is possible during Unit 2 procedure  
14 preparation I saw something, but I don't remember.

15 Q Let me show you what has been previously  
16 marked as B&W Exhibit 418. I believe this has been  
17 identified as the draft procedure submitted by B&W  
18 to TMI-1 for loss of reactor coolant/reactor coolant  
19 system pressure.

20 Would you flip through it and tell us if  
21 you remember ever reviewing this during the course  
22 of preparation of the TMI-2 operating and emergency  
23 procedures.

24 A I can't remember seeing it, no.

25 Q Would you look at the first page of the

2 procedure, the third page of the exhibit after you  
3 get past the cover letters. You will note that the  
4 beginning of the procedure has a section labeled  
5 "Purpose." Do you see that?

6 A Yes.

7 Q If you put B&W 272 in front of you,  
8 which is the Unit 2 emergency procedure that  
9 corresponds to the same subject, you will note that  
10 the beginning of that procedure does not have a  
11 "Purpose" section. Is that right?

12 A I note that, yes.

13 Q Do you know whose decision it was to take  
14 the "Purpose" section out of the draft procedure  
15 submitted by B&W for TMI-1 which eventually, through  
16 whatever process, became the procedure for TMI-2?

17 MR. BELTZER: TMI-2 procedures were a  
18 few stages from B&W 418, which Mr. Miller says  
19 he doesn't recall seeing. I am not sure there  
20 is any foundation for asking the question.

21 MR. WISE: I am just trying to save time.

22 Q You did at some time see the emergency  
23 procedures for TMI-1?

24 A Yes.

25 Q And you saw the emergency procedure for

1  
2 TMI-1 that covered loss of reactor coolant/reactor  
3 coolant system pressure, did you not?

4 A Yes.

5 Q In fact, in format and style, it is very  
6 similar to the emergency procedure that was adopted  
7 for TMI-2 which we have a copy of which is B&W 272,  
8 is that correct?

9 A Yes.

10 Q Neither the one for TMI-1 nor the one  
11 for TMI-2 has a "Purpose" section in it, right?

12 A That's correct.

13 Q And that is a difference from the draft  
14 that B&W submitted which we have in front of us as  
15 Exhibit 418, is that right?

16 A Difference in the draft they submitted  
17 in Unit 1.

18 Q That's right. Unit 1 didn't have a  
19 "Purpose" section, and when it came time to write  
20 the emergency procedure for Unit 2, that same format  
21 was carried forward, isn't that right?

22 A That same format was carried forward and  
23 there were never any comments from the B&W writer  
24 that they had a problem with that to me.

25 Q If you go back to the B&W draft procedure

1

2 that was submitted to TMI-1, you will note that the  
3 purpose of the procedure is to cover leak rates  
4 greater than 30 gallons per minute up to and  
5 including a 36-inch rupture, do you see that?

6

A Yes.

7

Q At any time while you were licensing  
8 for TMI-1 or during the time that you were  
9 supervising the preparation of emergency procedures  
10 for TMI-2, was it your understanding that the loss  
11 of reactor coolant/reactor coolant system pressure  
12 emergency procedure was intended or had as its  
13 purpose to apply to leak rates greater than 30  
14 gallons per minute up to and including the 36-inch  
15 rupture?

16

A I understood this procedure to be for a  
17 loss of coolant accident, and the 30 gpm I  
18 referenced to you the other day that at one time the  
19 Unit 1 technical specification allowed a 30 gpm  
20 leakage.

21

Q So it was your understanding that this  
22 procedure, and specifically now I am referring to the  
23 one for Unit 2, which is B&W 272, was to cover the  
24 full range of breaks from either the 30 gallons per  
25 minute as apparently was the point adopted in the

2 TMI-1 procedures, or ten gallons or 11 gallons per  
3 minute as adopted in the TMI-2 tech specs all the  
4 way up to the double-ended pipe break?

5 A Yes.

6 Q Would you look at the second section in  
7 the B&W-submitted draft for TMI-1 labeled  
8 "Description." You will note that no similar section  
9 appears in the emergency procedure for TMI-2, is  
10 that right?

11 A That is true.

12 Q Do you know whose decision it was to  
13 omit a section labeled "Description" from the TMI-1  
14 and TMI-2 emergency procedures?

15 MR. SELTZER: Objection. No foundation  
16 Mr. Miller was involved in the drafting  
17 procedures for Unit 1.

18 MR. WISE: I am just asking if he knew.  
19 He could have learned it at a later time.  
20 There are other circumstances he may have  
21 learned aside from himself being involved.

22 A If you look at the date of this memo or  
23 this procedure, this is somewhere around 1970. I  
24 wasn't in the company in 1970. I never saw the  
25 exact Unit 1 draft procedures, to my knowledge.

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You also mentioned Unit 2, and I just want to reiterate no one that wrote that procedure suggested to me that was a problem.

Q But when you saw the TMI-1 procedure after you did come on board Met Ed, they didn't have a "Description" section as appears in the B&W draft we have before us, did they?

A No.

Q So somewhere between this B&W draft and the TMI-1 procedures that you saw when you came to Met Ed, that had been removed? We can agree on that, right?

A Yes.

Q When it came time to draft the Unit 2 procedures, you desired the format and sections to be similar for TMI-2 to those that had been provided for TMI-1, right?

A I stated that I desired the procedures to be very similar from an operator's standpoint. I also stated that the Unit 1 procedure was not the only source document and that the B&W draft procedures were another source document.

Q Would you look at the second paragraph of the "Description" section. Without reading the

Miller

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2 whole thing, it discusses initial symptoms and their  
3 possible causes.

4

5 Now I would like to direct your attention  
6 to the last sentence, which reads, "However, the  
7 operator should assume the cause of the symptoms  
8 described above is a system rupture or leak, unless  
9 another cause can be immediately established."

9

10 Do you recall at any time during your  
11 training on TMI-1 being given that instruction?

11

A No.

12

13 Q Do you know whether during the course of  
14 the preparation of procedures for TMI-2 anyone at  
15 Met Ed made an effort to include an instruction, in  
16 words or effect, similar to that provided in the B&W  
17 description?

17

18 A During the preparation of those procedures  
19 in TMI-2, I don't have recollection of anyone asking  
20 for that addition, including the B&W personnel who  
21 prepared the procedure.

21

22 Q Do you know of any reason why a  
23 "Description" section was omitted from the TMI-2  
24 emergency procedure?

24

A I do not.

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Q This draft procedure which we have marked

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as B&W 418 is the draft procedure that you testified earlier you did not want for TMI-2, isn't it?

MR. SELTZER: I don't think he testified as to a specific draft procedure. I think he said he didn't want the whole set of B&W draft procedures which would have included this one.

Q With your counsel's amendment, do you agree with that?

A I don't agree I said I didn't ever want them. I said I wanted more than that.

Q It is true that you didn't want them in this format?

A No, I think we extensively went through this, and I stated that I wanted the procedure writer to use this as one of the source documents.

Q Are you telling us that it would have been perfectly acceptable to you if this procedure had been submitted for use at TMI-2?

MR. SELTZER: Now we are talking about this specific draft procedure for loss of coolant?

MR. WISE: Yes, B&W 418 in the format it is in.

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2           A        Could you read the first part of that  
3 question?

4           Q        I will restate it.

5                    Are you now saying that it would have  
6 been perfectly acceptable for you if the draft  
7 procedure for TMI-2 had been submitted in the same  
8 format as appears in B&W 418, which is the draft  
9 procedure that was submitted for TMI-1?

10          A        No, I am not saying that. I am saying  
11 that if any significant technical area had been  
12 submitted as a comment, I think it would have been  
13 considered and incorporated.

14          Q        Did you ever look back at the draft  
15 procedures for TMI-1 that B&W had submitted to see  
16 whether all of the sections and information that those  
17 draft procedures contained had been picked up in the  
18 procedures in use at TMI-1 or being submitted for use  
19 at TMI-2?

20          A        These procedures were all assigned to the  
21 B&W Company, and I felt that I had that guarantee.

22          Q        If you look at the B&W draft, you will  
23 see there is a third section on references. Do you  
24 see that?

25          A        Yes.

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2 Q That is not in the TMI-2 procedure, is  
3 it?

4 A The references section?

5 Q Yes.

6 A No, it does not appear to be.

7 Q And it wasn't in the TMI-1 procedure, was  
8 it?

9 A I would say probably not.

10 Q Did you think when you got procedures  
11 for TMI-2 that there was going to be a references  
12 section in there?

13 A I would not have envisioned it being any  
14 different in format like we stated before for Unit 1  
15 procedures.

16 Q Would you look at the fourth section in  
17 the B&W draft procedure. It is labeled "Limits and  
18 Precautions." Do you see that?

19 A Yes.

20 Q There is no similar section in the TMI-2  
21 procedure, is there?

22 A No, there is not.

23 Q And there wasn't one in the TMI-1  
24 procedure either, was there?

25 A No, there was not.

2 Q Would you look at the fifth section in  
3 the B&W draft procedure. It is labeled "Setpoints."  
4 Do you see that?

5 A Yes.

6 Q There is no similar section in the  
7 TMI-2 procedure, is there?

8 A No, there is not.

9 Q And there wasn't one in the TMI-1  
10 procedure, was there?

11 A No, there was not.

12 MR. SELTZER: Let me note for the record,  
13 without interrupting what you said previously,  
14 the part that B&W considered the procedure  
15 doesn't start until .6 on page 3. I don't know  
16 what the References and Description and  
17 Limits and Precautions are. Setpoints are. I  
18 assume there are other documents that contain  
19 limits and precautions and setpoints, but the  
20 actual procedure as described by B&W begins on  
21 page 3.

22 MR. WISE: Perhaps if B&W wants to hire  
23 you to speak for it, I think the people at B&W  
24 would disagree with you as to where this  
25 procedure begins. I believe their testimony

2 would be that it begins on page 1, not page 3,  
3 but that is something the B&W people can speak  
4 to at the appropriate time.

5 BY MR. WISE:

6 Q The point is that in fact, you knew that  
7 the TMI-1 and TMI-2 procedures did not contain any  
8 of the information listed in sections 1 through 5 of  
9 the B&W draft?

10 MR. SELTZER: Let me ask for a  
11 clarification. Are you saying that TMI-1  
12 didn't have limits and precautions and  
13 setpoints that included the information that is  
14 set forth here?

15 MR. WISE: That is not at all what I  
16 said.

17 Can I have the question reread.

18 MR. SELTZER: I think procedures include  
19 limits and precautions which plant you know  
20 had --

21 MR. WISE: I am speaking now of the  
22 specific emergency and operating procedures.  
23 If you want, I will limit it just to the LOCA  
24 procedure. The point is the same.

25 (Continued on next page)

Miller

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2 BY MR. WISE:

3 Q In fact, you knew that the emergency  
4 procedures prepared for TMI-1 and TMI-2 and in use  
5 at those plants did not contain the information that  
6 was listed in sections 1 through 5 of the B&W drafts?

7 A The emergency procedures generated at  
8 Met Ed were generated in accordance with the ANSI  
9 standards and NRC guidance. This information, while  
10 not contained in the front sections of the  
11 emergency procedure, was contained in the plant  
12 procedures, and I think you should separate. I  
13 believe the OP's do have these sort of sections,  
14 because as I said before, they are meant to be  
15 followed methodically and slowly. All this  
16 information is contained in B&W limits and  
17 precautions documents, in source documents in the  
18 control room, every reference there is there, and  
19 anything that is part of the procedure would have  
20 been expected to be in the procedure section.

21 Q Let me go back now to the description  
22 section and, in particular, the sentence I read you,  
23 "However, the operator should assume the cause of the  
24 symptoms described above is a system rupture or leak  
25 unless another cause can be immediately established."

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2           You testified I believe that during your  
3 TMI-1 licensing, no one ever gave you that  
4 instruction. Did anyone ever give you any other  
5 instruction regarding assumptions to be made in the  
6 event the symptoms described in the LOCA procedure  
7 were seen and no other cause could be immediately  
8 established?

9           A       Assuming that the symptoms in the LOCA  
10 procedure were evident and there were no other cause  
11 that could be determined, I was not given any  
12 instruction that you referenced nor trained in it.

13          Q       Are you saying that you were not given  
14 any instruction at all as to what to do under those  
15 circumstances?

16          A       Earlier in the deposition, you asked me  
17 if I was given instruction for unanalyzed events. I  
18 really believe that is the same question you just  
19 asked me, and the answer is, before the accident, no.

20               MR. SELTZER: I am not sure that is the  
21 question he is asking you now, though.

22               MR. WISE: I am not sure what the  
23 question is at this point either. I think the  
24 witness has made a statement which probably  
25 covers just about any question I would be

2           liable to ask in this area.

3                   (Discussion off the record between the  
4           witness and his counsel.)

5           MR. WISE: The witness has asked to have  
6           his last answer reread.

7           MR. SELTZER: And the last two questions  
8           which are interrelated.

9                   (Record read)

10       BY MR. WISE:

11           Q       Do you wish to make any clarification of  
12       that statement?

13           A       Yes, one: if those symptoms were  
14       evident and no other cause was determined, you are  
15       in the LOCA procedure and you have a leak.

16                   My confusion was that I for some reason  
17       thought your question had said I didn't have a leak,  
18       and I had all those symptoms, and I had no other  
19       cause. Starting out and saying I have all the  
20       symptoms, I am in that procedure.

21           Q       Until you can identify some other cause  
22       besides a rupture or leak, is that what you are now  
23       saying?

24           A       I am saying if I have all those symptoms,  
25       all of them, I have a rupture or a leak, and I am in

1  
2 that procedure until the guidance in the procedure  
3 takes me out.

4 Q I would like to switch to a new subject.

5 MR. WISE: Let me have marked as B&W  
6 770 a copy of a memorandum dated August 6,  
7 1975, authored by Mr. Seelinger and directed  
8 to a number of people, including Mr. Miller.

9 (Copy of a memorandum dated August 6,  
10 1975, authored by Mr. Seelinger and directed  
11 to a number of people, including Mr. Miller,  
12 marked B&W Exhibit 770 for identification, as  
13 of this date.)

14 Q Was there a time during the preparation  
15 for Unit 2 going into operation that you assigned  
16 Mr. Seelinger to devise a training program for  
17 Unit 2 operators?

18 A I am sure that is true.

19 Q If you take a look at B&W 770, is this  
20 a copy of the training program or an outline of the  
21 training program that Mr. Seelinger had devised and  
22 prepared in order to carry that into effect, at least  
23 for control room operators?

24 A I believe it is limited to control room  
25 operators at this particular time.

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Q Right. That is the subject of our interest, in any event. Do you remember receiving this?

A I know I received it. I remember it.

Q Is this in fact the training program that was devised by Met Ed for its Unit 2 control room operators as of August 1975?

A This is a very preliminary start of that program.

Q Did you have discussions with Mr. Seelinger concerning the content and format of the training program after you received this memorandum?

A Yes, I am sure I did.

Q And you made comments to him concerning your suggestion as to how it might be changed or improved?

A Yes, I am sure I did.

MR. WISE: Let me have marked as B&W 771 a memorandum dated March 12, 1976, signed by Mr. Tsaggaris, and addressed to a number of people, including Mr. Miller.

(Memorandum dated March 12, 1976, signed by Mr. Tsaggaris, addressed to a number of people, including Mr. Miller, marked B&W 771

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for identification, as of this date.)

Q The subject of this memorandum is the same as the previous one, Unit 2 control room operator training program.

Do you recall receiving a copy of B&W 771?

A Yes, I do. I need a minute to look at it.

Q Does this reflect the program for Unit 2 control room operator training as it existed in March 1976?

A Yes, it does.

Q Who designed this program?

A I believe Mr. Tsaggaris, the training department supervisor, did, and he would have done it from interaction with myself, Mr. Herbein and other experienced people, and with the knowledge that the initial Unit 2 CRO's came out of the Unit 1 operations department.

Q If you take a look at B&W 771, you will note that at the top someone has typed onto it "Training Department Administrative Memorandum No. 12 - Change 1." Do you see that?

A Yes.

Q If you go back and look at B&W 770, you will note that someone has also typed in the same

2 place at the top of the page the notation "Training  
3 Department Administrative Memorandum No. 12."

4 A Yes.

5 Q Would that indicate to you, given your  
6 knowledge of the Met Ed procedures, that B&W 771 is  
7 in effect a revision of B&W 770?

8 A Yes. It does not mean the first exhibit  
9 isn't applicable, though.

10 Q I don't understand what you mean.

11 A For instance, the classroom sessions  
12 which are detailed as far as subject material, and  
13 that would still I think be applicable.

14 Q So that the classroom sessions and so on  
15 that are outlined in 770 would still be applicable  
16 to the program as outlined in 771, is that what you  
17 are saying?

18 A Yes.

19 Q Who had authority to approve this  
20 program?

21 A The authority to approve it was with Mr.  
22 Tsaggaris as long as the program requirements met the  
23 FSAR which he states in the first sentence.

24 Q Did you or Mr. Herbein have any say  
25 concerning the content and form of the training

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program as proposed by Mr. Tsaggaris?

A Yes.

Q Or did he have the final say?

A I really believe Mr. Herbein and myself would have had final say. We would have depended heavily on him.

Q Did you approve this program as proposed by Mr. Tsaggaris in B&W 771?

A At that time, yes.

Q Did you believe it adequate to prepare the control room operators for TMI-2?

A Yes, based on the fact that these operators had come out of Unit 1 with some prior experience.

Q Was there a separate program for operators who did not have a TMI-1 license?

A I may have misled you. They did not necessarily have a license at TMI-1. They probably did not, in fact. Any operator we hired from outside would have had a specially designed program, depending on his background and experience and training previous.

Q Who would make the decision as to what kind of a program such an outside hire would require?

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A The training department in conjunction with myself and Mr. Herbein and utilizing the guidelines of the FSAR and the NRC reg. guides.

3

4

5

Q And you would look at the particular candidate and determine what his particular background and experience were?

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7

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A Yes.

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Q And based on that, you would decide how much training he required?

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A Yes.

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Q Let me show you what has been previously marked as B&W Exhibit 59, which is a copy of a memorandum from Mr. Tsaggaris addressed to you and a number of other people, dated August 30, 1976, the subject being Unit 2 Cold Licensing Program - Nine-Month Program.

18

Do you recognize B&W Exhibit 59?

19

A Yes.

20

21

22

Q Is this a copy of a memorandum that was prepared by Mr. Tsaggaris to outline the cold licensing program for TMI-2 control room operators?

23

A Yes.

24

Q Who put this program together?

25

A The same persons that I referenced the

2 last time.

3 Q That would be Mr. Tsaggaris and his  
4 staff?

5 A Yes, with input from Mr. Herbein and I.

6 Q Did you and Mr. Herbein approve this  
7 program?

8 A Yes.

9 Q When did the actual training of TMI-2  
10 control room operators begin? Do you recall,  
11 roughly?

12 A I remember that it started in August.  
13 I think it is August of 1976, but I could be a year  
14 off. It could have been August 1975 when the first  
15 memo was written.

16 Q Was there also a program going on during  
17 1975 and 1976 to keep operators who already had  
18 licenses on TMI-1 qualified?

19 A Yes.

20 Q Who devised that program?

21 A The training department.

22 Q At Met Ed?

23 A The training department at Met Ed, in  
24 accordance with the license.

25 Q Who was in charge of that?

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A The same individuals.

Q Mr. Tsaggaris again?

A Mr. Seelinger and then Mr. Tsaggaris.

MR. WISE: Let me have marked as B&W Exhibit 772 a memorandum dated January 28, 1976 from Mr. Tsaggaris to a group of people, including Mr. Miller. The subject is Requalification Program Makeup Assignments.

(Memorandum dated January 28, 1976 from Mr. Tsaggaris to a group of people, including Mr. Miller, subject: Requalification Program Makeup Assignments, marked B&W Exhibit 772 for identification, as of this date.)

Q Do you remember receiving a copy of B&W 772?

A I am sure I received it.

Q What was meant by "Requal. Makeup" which is referenced in the first paragraph of this document?

A The requalification program I believe allowed a makeup assignment when one could not attend the lecture.

Q The paragraph that opens the memorandum reads, "Due to the inordinate number of man-hours

1  
2 and paper being expended to currently supply each  
3 person in the requal. program with his own individual  
4 packet for requal. makeup, the following system  
5 is implemented."

6 The memorandum then goes on to describe  
7 a system for providing requal. materials in the  
8 training room and in the control room.

9 Do you recall that there was a problem  
10 around January 1976 getting the control room  
11 operators to attend the requal. program training  
12 sessions?

13 A This memorandum is applicable to TMI-1  
14 at that time only, and it is the requalification  
15 program, which means it is coverage of areas you have  
16 already been examined and successfully completed,  
17 and yes, I do know there was a problem with  
18 classroom attendance, and that was allowed by the  
19 administrative procedures.

20 Q Not that it was allowed there to be a  
21 problem?

22 A Allowed to be made up through study of  
23 the same area in a makeup package.

24 Q The last paragraph in the memorandum  
25 reads, "The implementation of this system will

1  
2 reduce the administrative burden of the requal.  
3 program and enable the instructors to better prepare  
4 and present the lecture material. Your cooperation  
5 is much appreciated."

6 Had there been previous to this  
7 memorandum an administrative burden on the training  
8 department which hampered its ability to prepare and  
9 present lecture material, to your knowledge?

10 MR. SELTZER: A burden created by the --

11 MR. WISE: By the inordinate number of  
12 man-hours and paper being expended to supply  
13 each person with his own individual packet.

14 MR. SELTZER: In other words, is that  
15 something you recall?

16 A I recall that being a burden and a  
17 burden that was causing the individuals in training  
18 to work beyond their 40-hour requirement, and that  
19 the other part of the burden was the paper work  
20 which was subject to NRC audit.

21 MR. WISE: I would like to have marked  
22 as B&W Exhibit 773 a handwritten memo with a  
23 typed portion attached to it. The handwritten  
24 memo is dated February 8, 1976, and it is  
25 addressed to Mr. Miller from Mr. Tsaggaris.

1  
2 (Handwritten memo dated February 8, 1976,  
3 addressed to Mr. Miller from Mr. Tsaggaris,  
4 with a typed portion attached to it, marked  
5 B&W Exhibit 773 for identification, as of this  
6 date.)

7 Q Do you recall receiving B&W 773?

8 A Yes.

9 Q Is it true that B&W 773, and particularly  
10 the attachment which appears to be a copy of the  
11 FSAR, constitutes a description of the training  
12 program as it existed for TMI-2 in February 1976?

13 MR. SELTZER: Are you asking does the  
14 typed portion of the last four pages constitute  
15 a description of the training program as it  
16 existed in 1976?

17 MR. WISE: We will take it that way, yes.

18 A Yes, and it goes beyond control room  
19 operator licensing which we have been discussing up  
20 to this point.

21 Q Mr. Tsaggaris in his handwritten  
22 memorandum which appears at the front of the exhibit  
23 states, "Here is a marked-up copy of the Unit 2  
24 training FSAR. We definitely need some work and  
25 planning in several areas."

1  
2                   Then you will note that the typewritten  
3 portion, which is four pages long and appears to be  
4 a copy of the FSAR, has various handwritten notes on  
5 it. Do you see that?

6           A       Yes.

7           Q       Would you turn to the section which begins  
8 on the second page of the typewritten portion, and it  
9 is labeled "Initial Nonsupervisory Staff Reactor  
10 Operator License." Do you see that?

11          A       Yes.

12          Q       Underneath that, there is a description  
13 of what the training program is going to include and  
14 it carries over onto the next page. If you look at  
15 item D, which concerns Unit 2 nuclear steam supply  
16 system, secondary, and balance of plant system, it  
17 says, "A systems course that addresses nuclear steam  
18 supply system, secondary, and balance of plant  
19 systems started in 1975. The course consists of  
20 approximately 160 hours of classroom training in  
21 Unit 2 systems. This program will conclude  
22 approximately 21 months prior to fuel loading."

23                   If you will note the handwritten comment  
24 that appears in the left-hand margin next to that  
25 particular item, it says, "Our records are poor on

1  
2 this and the shift foremen took this program over.  
3 I am contacting them to get a status."

4 Do you see that?

5 A Yes.

6 MR. SELTZER: I think you may have  
7 misread the last word in the second line. I  
8 think that might be "as" instead of "and."

9 MR. WISE: All right. I think you may  
10 be right.

11 Q Did you have any discussions with Mr.  
12 Tsaggaris concerning the record keeping with respect  
13 to the course described in item D that I read into  
14 the record?

15 A I am sure I did. I think this whole  
16 area, this Mr. Tsaggaris to Miller memo, was in  
17 response to my own keeping up with this program, with  
18 all the programs. That is why it was written.

19 Q What was meant by Mr. Tsaggaris'  
20 comments that the shift foremen took over this  
21 particular part of the program?

22 A Earlier in the deposition, you and I  
23 discussed a memo written in 1975 which is when the  
24 program started. I may have misstated 1976. In that  
25 memo, the shift foremen were assigned systems, and I

2 think this is just a follow-on to that. In other  
3 words, the shift foremen were assigned to teach those  
4 systems, because they were the best for the  
5 expertise. That is the best I can recollect it.

6 Q Did Mr. Tsaggaris ever get back to you  
7 after he had talked with the shift foremen to  
8 determine what the status of this particular item was  
9 was?

10 A I don't have a specific recollection,  
11 but it would have been implied that he would have  
12 gotten back to me if there were further problems.

13 Q Would you look down at item F, which  
14 reads, "Advanced systems, procedure, and nuclear  
15 theory training from 12 months prior to fuel  
16 loading, reactor operator license candidates will  
17 devote approximately one week out of every six weeks  
18 to formalized training. This training will include  
19 such topics as," and there is a list of eight items,  
20 the first one of which is emergency procedures.

21 What was your understanding as to who was  
22 going to teach this course described in item F?

23 A At this point, I don't think we had  
24 decided that yet, and if you look, it is recognized  
25 that this is a program that will be taught in the

1  
2 later phase.

3 Q Mr. Tsaggaris' comment in the left-hand  
4 margin with an arrow pointing to this item states,  
5 "We will have to develop this and we will have to  
6 have the Unit 2 shift foremen carry this teaching  
7 load."

8 Does that help refresh your recollection  
9 that as of February 1976 this program had not yet  
10 been developed?

11 A Yes.

12 Q It had not been?

13 A Mr. Tsaggaris is saying that.

14 Q Was it the intention of Met Ed to have  
15 the shift foremen at Unit 2 be the ones who would  
16 teach this particular part of the course?

17 A I think Mr. Tsaggaris was telling me that  
18 he felt he would have to have shift foremen help  
19 teach it, and that would especially be true in areas  
20 such as advanced systems and procedures, and he was  
21 trying to formulate the best way to do this.

22 Q Let me go back to the handwritten portion  
23 of the exhibit, the cover sheet from Mr. Tsaggaris  
24 to you. You will note that about halfway down the  
25 page Mr. Tsaggaris writes, "To answer your comments

1  
2 on licensing:" And then he has a number of points.  
3 The second one states, "Cross-licensing people like  
4 Guthrie, Zewe, Perks, et cetera," and then he has two  
5 comments written under that. The first is item A,  
6 "No written firm guidance is in the FSAR as to  
7 whether they do or do not have to take an NRC exam."  
8 Someone has written in a handwritten comment  
9 immediately above that. Is that your handwriting?

10 A Yes.

11 Q Could you read it for us?

12 A In response to his fact that it wasn't  
13 in the FSAR, I say "Clear as to what they wanted us  
14 to write, that is, we can cross-license without  
15 exam. They always have the option," "they" being the  
16 NRC, "the same as in Unit 1, anytime they want,"  
17 meaning they could examine us anytime.

18 Q What does all that mean? What were you  
19 saying?

20 A If you look at the whole memo, including  
21 the 2b statement, we had learned that it was not  
22 uncommon at similar sites, for instance, at Oconee,  
23 where the NRC would encourage and accept what was  
24 called cross-licensing, which would mean you train  
25 a licensed operator in the differences between units

1 Miller

2 and then he takes a company exam, and he can then  
3 amend his existing license to make it applicable to  
4 say, two units, and in Oconee, even three units.  
5 This is just saying that the NRC will not put in  
6 writing that they will not give an exam, but that is  
7 their option.

8 Q So what was being proposed by you and  
9 Mr. Tsaggaris to be done regarding these  
10 individuals, Messrs. Guthrie, Zewe and Perks, et  
11 cetera?

12 A That currently licensed individuals could  
13 obtain an amendment to their license for Unit 2 and  
14 could do that without a full NRC exam, and that that  
15 was being encouraged by the NRC and not discouraged.

16 Q And Met Ed was making the decision to go  
17 ahead an attempt to do that, to have them licensed  
18 for TMI-2 without having them go through a new NRC  
19 exam?

20 A For those limited number of persons with  
21 a license in Unit 1.

22 (Recess taken)

23 BY MR. WISE:

24 Q Isn't it correct that beginning as early  
25 as the first part of 1976 you were repeatedly advised

1  
2 that the training program for Unit 2 operators had  
3 significant problems?

4 MR. SELTZER: By "repeatedly advised,"  
5 how frequently are you implying?

6 MR. WISE: On a number of occasions and  
7 periodically.

8 A I think the answer to that question is  
9 yes, but I think that it must be given in the  
10 context that I took a very personal and detailed  
11 interest in training from the time I became Unit 2  
12 superintendent, as evidenced by these memos we looked  
13 at until now.

14 Q Isn't it true that the training program  
15 continued to experience significant problems all  
16 the way right up to the time of the TMI-2 accident  
17 in March 1979?

18 A It is true that the training program  
19 continued to have senior management focusing  
20 attention and continued to have problems. I don't  
21 agree with the word "significant." I in no way  
22 relate those to the events of the accident.

23 Q Let's look at some documents. Let me  
24 first show you B&W Exhibit 462, which has been  
25 previously marked. This is a copy of a memorandum

1  
2 from Mr. Tsaggaris addressed to a number of people,  
3 including you and Mr. Herbein, Mr. Lawyer. Do you  
4 see that?

5 A Yes.

6 Q It is dated March 1, 1977, and the  
7 subject is Unit 2 On-the-Job Training, Weekly  
8 Progress Report. He states, "Enclosed is the status  
9 of the Unit 2 on-the-job training progress for the  
10 week ending February 27, 1977."

11 Mr. Tsaggaris' handwritten comment is,  
12 "We are in trouble on this program! Progress for  
13 the last two weeks has almost been nonexistent. All  
14 groups have fallen way off the required curves. The  
15 auxiliary operators were given no assignments for  
16 the last two weeks, so that they could catch up. As  
17 a group, they made little or no progress. I don't  
18 know what the problem is, but we had better find out  
19 now or we will never make it by July 1. This matter  
20 will be discussed at G. P. Miller department head  
21 meeting on March 3, 1977."

22 Do you recall having a discussion in or  
23 around early March 1977 with Mr. Tsaggaris concerning  
24 the troubles that were being experienced in the on-  
25 the-job training program for Unit 2?

Miller

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A Yes.

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MR. SELTZER: This is for auxiliary operators, right?

4

5

MR. WISE: No, I believe it is for more than auxiliary operators.

6

7

8

Q Do you remember having a discussion in March 1977?

9

A In that time frame, we probably discussed this at every department meeting I held.

10

11

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Q And this is a problem that all groups had, control room operators, auxiliary operators, and others?

14

15

MR. SELTZER: When you say this is a problem, what does "this" refer to?

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MR. WISE: The trouble that is being experienced in the on-the-job training program. That covers auxiliary operators, SRO operators, and reactor operators, right?

20

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MR. SELTZER: It says "no assignments were given for the past two weeks." Is that the problem you are suggesting existed for more than just the AO's?

24

25

MR. WISE: No, I am talking about the first paragraph, that says "We are in trouble

2 in this program," and then it goes on to say  
3 "All groups have fallen behind," and there is  
4 an attached series of charts made out for  
5 different groups which include the auxiliary  
6 operators, the control room operators, and the  
7 senior reactor operators.

8 (Record read)

9 A The on-the-job training program was  
10 developed on a basis of being done on shift, and I  
11 believe books were given to each man. Basically, you  
12 would be taking the shift together through the  
13 systems, and this would relate more to the nonnuclear  
14 than to the nuclear, because of the number of  
15 systems in the nonnuclear area.

16 I don't mean to imply it didn't apply to  
17 all the systems, and it would be designed to be done  
18 by the shift, with the shift foreman/shift  
19 supervisor being the best teacher, and then each man  
20 demonstrating proficiency at his level as we went  
21 through the program.

22 It is a program that was very ambitious,  
23 and it was only one portion of the program for the  
24 whole unit, which includes licenses as well as  
25 nonlicenses.

Miller

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Q The only point of my question was that the problem that you were informed of in early March 1977 extended to not only auxiliary operators but control room operators and senior reactor operators but well, isn't that right?

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A It could only be done on a shift basis with the whole crew, and the maximum benefit was to auxiliary operators.

8

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Q Isn't it true that Mr. Tsaggaris' report to you concerned control room operators and senior reactor operators as well as auxiliary operators? Isn't that a fact?

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A That is a fact, but in my mind, it in no way gives a perception of the entire program, and by that, I mean this is one part of it, and I don't think it should be implied that the training program was unacceptable based on any one portion.

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MR. WISE: Let me next show and have marked as B&W 774 a memorandum dated June 2, 1977 from you to Mr. Lawyer.

(Memorandum dated June 2, 1977 from Mr. Miller to Mr. Lawyer marked B&W Exhibit 774 for identification, as of this date.)

MR. WISE: The subject is Unit 2 Operator

2

Licensing -- Final Training Phase.

3

Q Is Exhibit 774 a copy of a memo that you authored?

4

5

A Yes.

6

Q Mr. Lawyer was your boss at the time?

7

A I am not sure, but I also -- yes, he was my boss at that time.

8

9

Q Why did you mark this confidential at the time?

10

11

A I felt it was a privileged communication between my boss and I, and since training did not report to me, I felt it was important that Mr. Lawyer and I communicate prior to any action.

12

13

14

15

Q Prior to what kind of action?

16

A Requesting help from another department.

17

18

Q What other department do you have in mind?

19

A Training did not report to the superintendent.

20

21

Q Were you having any problem at that time with the training department?

22

23

A I felt it important to communicate with my immediate supervision and to gain a consensus there prior to going directly into the training

24

25

Miller

1

2 department.

3

4

Q You were concerned about the progress of the training, isn't that right, in June 1977?

5

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A Yes, I was concerned about the progress of the training; no more concerned than I had ever been at this stage of a plant start-up, and lastly, I was asking for something that was not in the scope of requirements for training.

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Q Let me read to you from your memorandum. The second paragraph says, "As is typical with every start-up, we are attempting to complete a year's worth of effort in about six months. The Unit 2 information at the critical detail level is just now becoming available in usable form."

16

17

Why were you attempting to complete a year's worth of effort in six months?

18

19

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24

A I think that is a little bit of an overstatement and maybe a little bit emotional on my part. It is not untypical in any nuclear plant start-up to have an awful lot of activity in the final phases. Additionally, the information I am speaking of is from the NRC, from B&W, and from Burns & Roe.

25

Q Was someone putting pressure on you to

1

2 get the unit started?

3 A I was putting pressure on me.

4 Q The next paragraph states, "Over the  
5 past months, Joe Colitz and I have fielded many  
6 interface problems between training and operations.  
7 Many of the concerns of our operations group involve  
8 the direct applicability of the class room  
9 presentation to the units. I feel operations has a  
10 somewhat narrow perspective without enough  
11 consideration for all the peripheral iter, but the  
12 main thrust of their concern is one we must address  
13 and solve."

14 What was the concern or the main thrust  
15 of the concern that operations had?

16 A The main thrust that I believe I am  
17 referring to here is that operations only considered  
18 the perspective of a plant from operations training  
19 standpoint, and I was attempting to get this Unit 2  
20 horse book, which is an abbreviation for it, from the  
21 training department in order to be an additional aid  
22 to the Unit 2 licensing process.

23 Q Isn't it true that the main thrust of the  
24 concern expressed by the operations group was that  
25 they didn't feel that the classroom training that

Miller

1  
2 they were receiving was directly applicable to the  
3 operation of the units? Isn't that what you mean by  
4 the second sentence in that paragraph?

5 A Yes, that is what I meant by the second  
6 paragraph.

7 Q And you --

8 MR. SELTZER: Are you finished?

9 THE WITNESS: No.

10 A I also said in the second paragraph that  
11 their perspective might not be broad enough to be  
12 accurate.

13 Q And you wanted to have the training  
14 department prepare the so-called horse book for  
15 Unit 2 as an aid to the operator trainees in getting  
16 ready to pass their NRC license exam, isn't that  
17 right?

18 A That's right, and additionally, I  
19 offered to provide some operations help to that  
20 effort.

21 Q And you were concerned that without it,  
22 the operators' current knowledge of the plant was  
23 not adequate, isn't that right?

24 Let me read you what you wrote. "I  
25 consider this package to be essential to both the

1  
2 operators' knowledge and confidence. If you go out  
3 to the shifts and ask key questions on major license  
4 items at this time, many 'I don't know's' are heard."

5 Is that an accurate assessment of the  
6 situation as of June 1977?

7 A I don't agree that I felt it was  
8 inadequate. I am saying that we have an awful lot  
9 of new information that just became available in  
10 this memo and I am saying with this horse book,  
11 which again I would like to emphasize was above and  
12 beyond the requirements of licensing, I felt we could  
13 do the most in the shortest time.

14 Q Let me read you what you said on the  
15 carryover page, the last sentence. "This item is  
16 one I feel to be essential, and the training  
17 department must schedule around it or escalate their  
18 hours over this short period to assure the Unit 2  
19 license."

20 Did you feel that the horse book was  
21 essential to getting licensed operators for TMI-2?

22 MR. S Is that another way of  
23 asking whether "this item" that is referred to  
24 in the last sentence refers to the horse book  
25 preparation?

2 MR. WISE: Yes. I suppose that is one  
3 way of putting it.

4 A My meaning was not meant to say that  
5 this one item would give the ability to a man to get  
6 a license. This meant to say that after an awful  
7 lot of other training and after an awful magnitude of  
8 information became currently available, that this  
9 was a vehicle which could be used to gain that  
10 knowledge, and very much tailored to the  
11 examinations in the shortest period of time, and I  
12 was saying that this vehicle was in my view the best  
13 available vehicle to get to that point.

14 Q And you wanted the operators to be able  
15 to have this in preparing to take their NRC exams?

16 A Yes, and that is based on the fact that  
17 they had done an awful lot of training before this.

18 Q Was the so-called horse book prepared?

19 A Yes.

20 Q In item 7 you describe what the book  
21 would include. You say it is about three inches  
22 thick and contains the following types of  
23 information. Then you have a list of the information  
24 that the horse book would include. The first item is  
25 key operating procedures condensed to one sheet.

2 The second one is key emergency procedures condensed  
3 to one sheet. And the third one is key abnormal  
4 procedures condensed to one sheet.

5 Was it your understanding that in the  
6 horse book, an emergency procedure that might be more  
7 than one page long, might be many pages long, would  
8 be condensed down to simply one page?

9 A This was written to my boss to give him  
10 the types of information. It was my view that once  
11 you had been trained thoroughly, you could then, for  
12 instance, put the key emergency procedures relative  
13 to manual immediate action which has to be memorized  
14 on one sheet. That in no way meant that you should  
15 limit your study to that.

16 Q You were supposed to study the follow-up  
17 actions, too?

18 A This makes the assumption you are  
19 familiar with the EP and that the one sheet would be  
20 an aid to passing the exam. Certainly it would have  
21 the manual immediate action on it.

22 Q You conclude your memo by writing, "In  
23 short, if I were told to get a license today, I  
24 would take this book and some supplemental  
25 information and make a good run at a license. I say





## I N D E X

WITNESS	PAGE
Gary P. Miller	398

## E X H I B I T S

B&W  
FOR IDENTIFICATION

769	Memorandum dated April 14, 1977 from Mr. Miller to Mr. Herbein	411
770	Copy of a memorandum dated August 6, 1975, authored by Mr. Seelinger and directed to a number of people, including Mr. Miller	441
771	Memorandum dated March 12, 1976, signed by Mr. Tsaggaris, addressed to a number of people, including Mr. Miller	442
772	Memorandum dated January 28, 1976 from Mr. Tsaggaris to a group of people, including Mr. Miller, subject: Requalification Program Makeup Assignments	448
773	Handwritten memo dated February 8, 1976, addressed to Mr. Miller from Mr. Tsaggaris, with a typed portion attached to it	451

INDEX OF EXHIBITS  
(continued)

SW	FOR IDENTIFICATION	PAGE
774	Memorandum dated June 2, 1977 from Mr. Miller to Mr. Lawyer	462

-oOo-