

ORIGINAL

-----x

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. :

-----x

Continued deposition of General Public  
Utilities Service Corporation, by RONALD J.  
TOOLE, taken by defendants pursuant to adjourn-  
ment, at the offices of Davis, Polk & Wardwell,  
Esqs., One Chase Manhattan Plaza, New York, New  
York, on Tuesday, June 23, 1981, at 9:45 o'clock  
in the forenoon, before Joseph R. Danyo, a  
Notary Public within and for the State of New  
York.

8306290824 B10623  
PDR ADOCK 05000289  
T PDR



WALTER SHAPIRO, C.S.R.  
CHARLES SHAPIRO, C.S.R.

DOYLE REPORTING, INC  
CERTIFIED STENOGRAPHIC REPORTER  
369 LEXINGTON AVENUE  
NEW YORK, N.Y. 10017  
TELEPHONE 212 - 867-8220



1  
2 R O N A L D J. T O O L E, having been  
3 previously duly sworn, resumed and testified  
4 further as follows:

5 MR. STEWART: Mr. Glassman, before the  
6 beginning of our session today, you informed me  
7 of something either I had not been told or I  
8 just didn't understand, that you said you told  
9 me yesterday. It had been my impression our  
10 deposition of Mr. Toole this week would run to  
11 the end of business Wednesday, and you told me  
12 it was going to run until the end of today.  
13 Is that correct?

14 MR. GLASSMAN: I told that to you yesterday  
15 morning, and perhaps you misunderstood. I  
16 indicated yesterday we were willing to run late  
17 yesterday, which we did and we are willing  
18 to run late today, and we are willing to bring  
19 back Mr. Toole, if required, although I find it  
20 hard to believe it would require another session  
21 of Mr. Toole.

22 MR. STEWART: Mr. Toole was produced, as I  
23 understand it, by plaintiffs pursuant to an  
24 agreement between the parties that required for  
25 him to be produced for the entire week. Until

1  
2 the opening of the session yesterday, I heard  
3 nothing from plaintiffs or plaintiffs'  
4 counsel to the affect that Mr. Toole  
5 would be available for less than the entire week.  
6 I do find it objectionable that you would show up  
7 at the first session of a deposition scheduled  
8 for a week and inform us that you unilaterally  
9 cut the schedule in more than half without  
10 notifying us ahead of time, without allowing us  
11 to make necessary arrangements.

12 MR. GLASSMAN: I regret that there  
13 apparently has been a misunderstanding between  
14 counsel. I was not aware there was an agreement  
15 that Mr. Toole would be away for a particular  
16 number of days this week. As you are aware and  
17 we had advised you, the reason Mr. Toole would  
18 not be available later this week was because he is  
19 attending a B&W Superintendents' conference in  
20 and around Lynchburg, and we had thought that  
21 since this was a B&W conference that you would  
22 be advised of that. We regret if there is a  
23 misunderstanding, and we will cooperate in  
24 scheduling further dates for completion of Mr.  
25 Toole's deposition, if you are unable to complete

1  
2 that today.

3 MR. STEWART: I would have thought since  
4 Mr. Toole works for your client, you would have  
5 been advised of his travel plans. It is our  
6 position that the deposition should be resumed  
7 as soon as possible. When is the B&W meeting in  
8 Lynchburg to be concluded this week?

9 MR. GLASSMAN: I think this particular  
10 colloquy is not fruitful to have on the record  
11 here. We will advise you as soon as we can of  
12 an early resumption date. We will cooperate.

13 MR. STEWART: Why don't we find out when  
14 the B&W conference is going to be over so we  
15 can get at least some understanding of when Mr.  
16 Toole would be once again available?

17 MR. GLASSMAN: I don't think it is  
18 fruitful to do this on the record. The longer  
19 we debate this between counsel on the record,  
20 the less testimony you will be able to take of  
21 Mr. Toole. You have our assurance we will  
22 cooperate to have Mr. Toole return, if you are  
23 unable to complete the testimony today.

24 MR. STEWART: We are indeed here for a  
25 deposition which you have cut short without

1  
2 telling anyone. It is our position that Mr.  
3 Toole should be produced once again for  
4 examination as soon as he is free of his  
5 responsibilities of attending the B&W meeting.  
6 It is our position he should be produced again  
7 next week. Originally he was scheduled to be  
8 examined for a period of five days, and the  
9 schedule was agreed to between the parties, and  
10 even after the end of the session today he  
11 should be brought back for a period which I  
12 cannot represent would be any shorter than three  
13 days, and I would like those three days to be  
14 three sequential days. I think it is ridiculous  
15 to bring back the witness for two days here and  
16 one day here and two days here. I think it is  
17 unfair to the witness.

18 MR. GLASSMAN: I don't think anybody here  
19 has mentioned that we are bringing the witness  
20 back for one day. We will try to be cooperative.  
21 We will attempt to be cooperative in line with  
22 our continuing policy in the conduct of the  
23 litigation. I don't know how many more times  
24 I can tell you what the facts are as we saw them.  
25 There will be no attempt to deprive you of the

1  
2 ability to examine Mr. Toole fully and as  
3 promptly as possible.

4 MR. STEWART: It is not my misunderstanding.  
5 It is your failure to let us know until the very  
6 last minute of your own witness's plans.

7 MR. GLASSMAN: At the risk of repeating  
8 what is already on the record --

9 MR. STEWART: May I finish my statement.  
10 Your desire not to have this discussed on  
11 the record leaves me to question your motives,  
12 but it is our position that Mr. Toole should be  
13 brought back next week.

14 MR. GLASSMAN: We shall advise you.

15 MR. STEWART: I would like to be advised  
16 at the end of the day.

17 MR. GLASSMAN: We will advise you of the  
18 facts. If you insist on putting them on the  
19 record rather than continuing with the testimony,  
20 you are entitled to pay for the transcript.

21 MR. STEWART: I put them on the record,  
22 because I find it difficult to get a clear  
23 statement from you on the witness's availability.

24 Let's mark this as Defendants' Exhibit 157.

25 (Schedule for meetings of Unit No. 2

1  
2 Operations Review Committee, April 24-29,  
3 1978, was marked Defendants' Exhibit 157 for  
4 identification, as of this date.)

5 EXAMINATION (continued)

6 BY MR. STEWART:

7 Q I have handed you a document marked  
8 Exhibit 157 for identification. It purports to be a  
9 schedule for meetings of a group called the Unit 2  
10 Operations Review Committee.

11 What is the Operations Review Committee?

12 A It is a committee of the Met Ed operating staff  
13 to review operations events.

14 Q Is it different from the Plant Operations  
15 Review Committee?

16 A Not to my knowledge.

17 Q It is the same thing as the PORC, to  
18 your knowledge?

19 A Yes, it is.

20 Q And you know of no group called the  
21 Operations Review Committee other than the group also  
22 known as the PORC; is that correct?

23 A That's correct.

24 MR. STEWART: Let's have this marked as  
25 Defendants' Exhibit 158.

1  
2 (Group of documents headed "Audit Report  
3 Finding Form," first page dated June 23, 1976,  
4 was marked Defendants' Exhibit 158 for  
5 identification, as of this date.)

6 Q I have placed before you a document that  
7 has been marked for identification as Defendants'  
8 Exhibit 158, a document entitled "Audit Report Finding  
9 Form," and it is dated June 23, 1976.

10 Have you ever seen this document before?

11 A That is my signature, so I assume I have.

12 Q What is this document?

13 A It is a GPU Service Company audit report.

14 Q Under what circumstances were audit reports  
15 prepared by GPUSC?

16 A When the QA organization performed an audit,  
17 although I don't recognize this form offhand as a  
18 QA form.

19 Q When you say QA organization, whom are you  
20 referring to?

21 A GPU has a QA organization on site.

22 Q Who headed that organization?

23 A Ray Fenti.

24 Q Did that organization periodically conduct  
25 audits?

2 A Yes.

3 Q Of what?

4 A Of the startup program.

5 Q To your knowledge, did they also conduct  
6 audits of anything else?

7 A Yes, they did, and I am not exactly sure of what.

8 Q What was your understanding of the range of  
9 their authority to conduct audits?

10 A I believe their authority allowed them to  
11 conduct an audit on anything that was identified in  
12 QC scope.

13 Q What was within QC scope?

14 MR. GLASSMAN: I object to this line of  
15 questioning. This witness is not the proper  
16 person to ask about quality control. It is not  
17 his area. I will let him answer this question.

18 Q You may answer the question.

19 A I can't define that in total.

20 Q What is your best definition?

21 A Safety-related systems and some expensive  
22 components that GPU decided to put in QA scope.

23 Q Any particular components you know of?

24 A One of which was the reactor coolant pump.

25 Q What does QC stand for?

2 A Quality Control.

3 Q What does QA stand for?

4 A Quality Assurance.

5 Q Is there a difference between those two  
6 terms, to your knowledge?

7 A Quality Control assures the quality of the  
8 product in the field, and Quality Assurance assures  
9 that Quality Control is doing their job properly.

10 Q Does Quality Assurance have any other  
11 function other than assuring that Quality Control is  
12 doing its job properly?

13 A It runs an audit program which audits functions  
14 within QC scope.

15 Q Was this document prepared in response to  
16 an audit conducted by the organization at the Island?

17 A I am not sure.

18 Q To your knowledge, did you prepare this  
19 document?

20 A I did not prepare this document.

21 Q Did you review this document?

22 A My signature is on it, so I have seen it, and  
23 I assume I reviewed it.

24 Q Was it your practice to review documents  
25 before signing them?

1

2 A Yes.

3

Q Did GPUSC prepare audit report finding  
4 forms in the regular course of its business?

5

A Yes.

6

Q Was this document prepared in the regular  
7 course of GPUSC's business?

8

THE WITNESS: Can you read that back to me.

9

(Record read.)

10

A Yes.

11

Q Does GPUSC keep a file of audit report  
12 finding forms?

13

A I believe they do.

14

Q Where is that file kept?

15

A I don't know.

16

Q Is it kept at Three Mile Island?

17

A I can't answer that.

18

Q During the period when you were at Three  
19 Mile Island, do you know where the file was kept?

20

MR. GLASSMAN: Objection. I am not sure  
21 what period we are talking about. Mr. Toole  
22 has testified regarding his present position.

23

Q During the period at which you were at  
24 Three Mile Island prior to the end of '78, do you  
25 know who maintained this file?

2 A I believe this file would have been maintained  
3 by Ray Fenti.

4 Q He was the person that worked for the  
5 Quality Assurance organization?

6 A He was the auditor who audited Startup and Tests.

7 Q Did he work for the Quality Assurance  
8 organization?

9 A Yes.

10 Q Did the Startup and Test group itself  
11 keep a file of these forms?

12 A I don't remember.

13 Q One way or the other?

14 A I don't remember one way or the other.

15 MR. STEWART: Let's have marked as the  
16 next exhibit in order a document entitled  
17 "Superintendent's Event Report."

18 (Document entitled "Superintendent's  
19 Event Report" was marked Defendants' Exhibit  
20 159 for identification, as of this date.)

21 Q What is this document?

22 A Superintendent's event report.

23 Q Have you ever seen this document before?

24 A Not that I remember.

25 Q Have you ever seen any document before

1  
2 entitled a "Superintendent's Event Report"?

3 A In the time frame up until 1978?

4 Q At the end of 1978, yes.

5 A I don't remember any in detail.

6 Q Do you remember seeing any at all?

7 A No.

8 Q In other words, before the end of 1978,  
9 you never saw any document entitled "Superintendent's  
10 Event Report"; is that your testimony?

11 A I don't remember seeing any.

12 Q Since that time, have you ever seen any  
13 superintendent's event reports?

14 A Yes.

15 Q Who prepares these documents?

16 A It could be a shift supervisor.

17 Q Do you know who the superintendent is  
18 who is referred to in the title of this document?

19 MR. GLASSMAN: Objection. The witness  
20 testified he never has seen these reports before.

21 MR. STEWART: That is not his testimony.  
22 He testified that since the end of 1978 he has  
23 seen these documents, and that is what I am  
24 asking.

25 MR. GLASSMAN: Are you asking about the

1

2 period after 1978?

3

MR. STEWART: That is what I just told you.

4

MR. GLASSMAN: I just want the witness to  
5 understand the time frame.

6

MR. STEWART: He ought to. It has been  
7 asked five times.

7

8

A Are you asking me who the superintendent is  
9 today?

10

Q I am asking you what position is referred  
11 to by the title "Superintendent"?

11

12

A Today?

13

Q Sure.

14

A That would be my position, which today my title  
15 is Operations and Maintenance Director.

15

16

Q What was the title of the position you  
17 now hold before it was called the Operations and  
18 Maintenance Director?

18

19

A My previous title was Station Manager.

20

Q Was there ever, to your knowledge, a title  
21 of Unit Superintendent?

21

22

A Yes.

23

Q What were the responsibilities of the  
24 unit superintendent?

24

25

A There was a unit superintendent in Unit No. 1

2 and there was a unit superintendent in Unit No. 2,  
3 and the people reporting to the unit superintendent  
4 are the operations supervisor, the maintenance  
5 supervisor, and the technical supervisor.

6 Q What were the responsibilities of the  
7 unit superintendent at TMI-2 in 1978?

8 A He was in charge of the people who operated,  
9 maintained, and provided technical input for Unit 2.

10 Q Since 1978, you have seen forms such as  
11 this form?

12 A Yes, I have.

13 Q For TMI-1?

14 A Yes.

15 Q For TMI-2?

16 A Not that I remember.

17 Q Are the superintendent's reports for TMI-1  
18 kept in a central file?

19 A I believe they are.

20 Q Is there an index to that file?

21 A Not to my knowledge.

22 Q Is there an administrative procedure or  
23 requirement at TMI-1 pursuant to which these reports  
24 are kept?

25 A Yes.

1  
2 Q To your knowledge, is there a similar  
3 requirement at Unit 2?

4 A I don't know what they are doing in Unit 2  
5 presently.

6 Q To your knowledge, was there a similar  
7 requirement at Unit 2 at some time in the past?

8 A I believe there was, yes.

9 Q What is the basis of your statement that  
10 you believe there was a requirement at Unit 2 at some  
11 point in the past to keep forms such as this form?

12 A In the past, the administrative procedures for  
13 Unit No. 1 and Unit No. 2 were the same.

14 Q To your knowledge, were superintendent  
15 event reports kept at Unit 1 before the end of 1978?

16 A I don't know if they were maintained in Unit  
17 No. 1.

18 Q Does the administrative requirement that  
19 you referred to a moment ago also require that files  
20 of these reports be kept?

21 A I don't remember the content of the procedure.

22 Q Do you remember the number of the  
23 procedure?

24 A No.

25 Q Toward the end of yesterday's session, we

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

discussed plant operating experience and specifically whether or not you had been informed at any time prior to the end of 1978 of failures of pilot operated relief valves at other nuclear stations.

MR. STEWART: I would like to have marked as the next exhibit in order a page from a document known as the Technical Staff Analysis Report on Pilot-Operated Relief Valve (PORV) Design and Performance. This report was made to the President's Commission on the accident at Three Mile Island.

(Document entitled "Technical Staff Analysis Report on Pilot-Operated Relief Valve (PORV) Design and Performance" was marked Defendants' Exhibit 160 for identification, as of this date.)

Q I am handing to you this document that has been marked for identification as Defendants' 160. This is not the complete report, but is rather the cover page, page 6, page 7 and page 8.

I refer you to page 7 which is a table entitled "Stuck Open PORVs in PWRs."

MR. GLASSMAN: I assume, in keeping with our practice, we will be provided with a copy

1

2

of the exhibit?

3

MR. STEWART: Yes.

4

5

Q Have you had a chance to look at that document?

6

A Yes.

7

8

9

10

11

Q At any time prior to the accident at Three Mile Island in March 1979, were you told by anyone or did you learn from any source there had been a failure of a PORV in the reactor at the Palisades in September 1971?

12

A Not that I remember.

13

14

15

16

Q At any time prior to the accident, were you told by anyone or did you learn from any source that there had been a failed open PORV in the Oconee-2 plant in August 1973?

17

A Not that I recall.

18

19

20

21

Q At any time prior to the accident at Three Mile Island, were you told by anyone or did you learn from any source that there had been a failure of a PORV at Oconee-2 in November 1973?

22

MR. GLASSMAN: I object to the form.

23

24

25

There appears to be a difference in the questioning, whether there has been a failed open valve, and now you are talking of a

2 failure.

3 MR. STEWART: I'll rephrase the question.

4 Q At any time prior to the accident at  
5 Three Mile Island, were you told by anyone or did  
6 you learn from any source that there had been a  
7 failure of a PORV at Oconee-2 in an open position in  
8 November 1973?

9 A Not that I recall.

10 Q Were you told by anyone before the TMI  
11 accident that a PORV at the Beznau plant in  
12 Switzerland had failed open in August 1974?

13 A Not that I remember.

14 Q Are you familiar with a plant whose name  
15 is abbreviated as ANO?

16 A That is Arkansas.

17 Q Were you told by anyone prior to the  
18 accident at Three Mile Island that the Arkansas-1  
19 plant had suffered a PORV failure in an open position  
20 in August 1974?

21 A Not that I recall.

22 Q Were you told by anyone before the time  
23 of the Three Mile Island accident that a PORV at the  
24 Oconee-3 reactor had failed open in June 1975?

25 A Not that I recall.

2 Q Were you told by anyone before the Three  
3 Mile Island accident that a PORV at the Crystal River  
4 plant failed open in November 1975?

5 A Not that I remember.

6 Q And I asked you yesterday whether you had  
7 been told by anyone or learned from any source that a  
8 PORV at the Davis-Besse plant had failed in September  
9 1977 and again in October 1977. Had you heard that  
10 from anyone prior to the TMI accident?

11 A Not that I remember.

12 Q Were you told by anyone prior to the  
13 TMI accident that a PORV at the Rancho Seco plant had  
14 failed open in June 1978?

15 A Not that I remember.

16 Q Would it be fair to say that before the  
17 time of the Three Mile Island accident you had not  
18 heard of any of the ten PORV failures I just asked  
19 you about; is that correct?

20 A I don't remember any of the ten you identified.

21 Q Do you have any recollection whatsoever of  
22 hearing in any way about any of those events?

23 A Not that I recall.

24 MR. STEWART: I would like to have this  
25 marked as the next exhibit in order.

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

(Document headed "Current Events Power Reactors," bearing a date 1 September - 31 October 1977, was marked Defendants' Exhibit 161 for identification, as of this date.)

Q I hand you a document that has been marked for identification as Defendants' Exhibit 161, and ask you to take a look at it.

Have you seen this document before?

A Not that I remember.

Q Does looking at this document refresh your recollection of whether you had heard before the end of 1978 about a malfunction of the PORV at the Davis-Besse Nuclear Power Station?

A No, it does not.

Q You had testified yesterday that from time to time you would read editions or issues of the periodical entitled "Current Events Power Reactors." Is that what this is?

MR. GLASSMAN: Objection. There seems to be a possible assumption in the question that this is one of the items which Mr. Toole might have read, and that is not the testimony.

MR. STEWART: That is not the intent of the question.

2 A Yesterday I testified that I sometimes read  
3 Current Events Power Reactors submittals that we  
4 received. This submittal is in a different format  
5 than I remember seeing.

6 Q What was the format that you remember  
7 seeing?

8 A I am not sure, but this doesn't appear to be  
9 what I remember.

10 Q What is it that you remember?

11 A As I remember, these submittals used to be on an  
12 odd sized piece of paper and used to be very crammed  
13 in.

14 Q In terms of content, is it your recollection  
15 that the content of the documents you used to see  
16 varied in form or completeness of detail from the  
17 content of this document?

18 A The content of this document is similar to what  
19 I remember seeing.

20 Q Is it your testimony the only difference  
21 between this document in form and the documents which  
22 you had previously would be one of format?

23 A As I remember, the format was different, and  
24 that is the only difference that I remember.

25 MR. GLASSMAN: We are just talking of

2

general format, not about the content of the particular document we have now.

3

4

MR. STEWART: The witness testified he doesn't recall seeing this before.

5

6

Let's mark as Defendants' Exhibit 162 for identification a document entitled "Current Events Power Reactors, apparently relating to the period August-September 1975.

7

8

9

10

(Document entitled "Current Events Power Reactors," relating to the period August-September 1975, was marked Defendants' Exhibit 162 for identification, as of this date.)

11

12

13

14

Q I ask you to look at pages 3 through 6 of this document. On page 6 you need read only to the heading that reads "Low Flow Feedwater Line Severs at 6x4 Reducer."

15

16

17

18

Have you had a chance to read this document?

19

20

A Yes.

21

Q At least the pages I referred you to?

22

A Yes.

23

Q I direct your attention to the first page of the document. What is this document?

24

25

A Current Events Power Reactors.

2 Q What period does it relate to?

3 A August to September 1975.

4 Q In the upper right-hand corner of the  
5 document, there are some words written. Do you  
6 recognize those words?

7 A United States Nuclear Regulatory Commission.

8 Q Above that in handwriting is what appears  
9 to be someone's name. Do you recognize that name?

10 A W. S. Poyck.

11 Q How is that spelled?

12 A It appears to be P-o-y-c-k.

13 Q Do you know of anyone at Three Mile Island  
14 by that name?

15 A There was an individual at TMI named Poyck. He  
16 is no longer with the company.

17 Q When did he leave the company?

18 A I don't remember.

19 Q Did he leave Three Mile Island before you  
20 did?

21 A Yes, he did.

22 Q You left in December 1978; is that right?

23 A Yes.

24 Q What was Mr. Poyck's position?

25 A He was in the Administrative Department and

2 the clerical staff reported to him.

3 Q To your knowledge, did he have any  
4 responsibilities for training?

5 A Not that I remember.

6 Q To your knowledge, did he have any  
7 responsibilities other than those you have described  
8 in his capacity as administrator?

9 A I do not know of his complete area of  
10 responsibility.

11 Q I direct your attention to the third page  
12 of this document. There is a center heading entitled  
13 "Failure of Safety Relief Valve." Are you familiar  
14 with the event described in the several paragraphs  
15 from pages 3 to 5 under that heading?

16 A I don't remember ever reading of this event.

17 Q Before the accident?

18 A At any time other than today.

19 Q I direct your attention to page 5 of this  
20 document. The middle of the page has the heading  
21 "Excessive Reactor Coolant System Cooldown Rate."  
22 Do you recall reading or hearing of this event at any  
23 time prior to the accident at TMI?

24 A I do not.

25 Q Does seeing this document refresh your

1

2

recollection in any respect of any failure of a PORV  
prior to the accident at Three Mile Island?

3

4

A It does not.

5

6

Q Have you seen this document before, to  
your knowledge?

7

A Not to my knowledge.

8

9

Q I direct your attention to the fifth  
full paragraph on page 5. Above that paragraph

10

appears to be some handwriting. Does that say

11

"ask class if this happened what would you expect to

12

see and what would you do"?

13

MR. GLASSMAN: You are asking the witness

14

whether he can read what is a somewhat illegible

15

copy?

16

MR. STEWART: Yes.

17

A I can't read that.

18

Q Can you make out any of the words that

19

are handwritten there?

20

MR. GLASSMAN: I object to this line of

21

questioning. The witness said he doesn't recall

22

ever having seen this document. He can't make

23

out the handwriting. He is not an expert on

24

handwriting. I don't think this is really an

25

appropriate line of questioning for him.

1

2

MR. STEWART: You instruct him not to answer the question?

3

4

MR. GLASSMAN: He can answer if he can read a word or two. That is fine with me.

5

6

A Now that you have identified what it said, it appears to me that it says what you interpreted it to say.

7

8

9

MR. STEWART: I would like to have marked as the next exhibit in order a series of documents beginning with the memorandum dated September 27, 1973, addressed to J. E. Wright who is identified as the TMI Site Quality Assurance Manager.

10

11

12

13

14

15

16

17

18

(Group of documents beginning with a memorandum dated September 27, 1973, addressed to J. E. Wright, was marked Defendants' Exhibit 163 for identification, as of this date.)

19

20

Q Have you had an opportunity to review this document?

21

22

A I have looked it over. It is very difficult to read.

23

24

Q I apologize for its illegibility. This is the condition in which it was produced to us.

25

Have you ever seen this document before,

2 any of the documents in this file before?

3 A Not that I remember.

4 Q Do you recall hearing at any point or  
5 learning from any source of the matters discussed in  
6 this series of documents?

7 A I do not have a clear recollection of this pin  
8 problem in the valves.

9 Q Do you have any recollection of that  
10 problem?

11 A I don't have a clear recollection. It seems to  
12 me I remember something about a pin problem.

13 Q What is it that you remember?

14 A It is not really clear other than after I read  
15 this, I have some vague memory that a pin problem  
16 existed in the valves at one time at Oyster Creek.

17 Q Is it fair to say this document refreshed  
18 your recollection as to that problem?

19 A It didn't refresh it very well.

20 Q Did you have any memory of that problem  
21 before I showed you this document?

22 A No.

23 Q After I showed you this document, you had  
24 some recollection; is that fair to say?

25 A Some recollection, yes.

2 MR. GLASSMAN: So the record is clear, I  
3 am not sure whether Mr. Toole's recollection  
4 relates to the particular event here or not.  
5 You can pursue that as you will.

6 Q At one point did you have knowledge of a  
7 pin problem in electromatic relief valves at Oyster  
8 Creek?

9 A I think at some point that I had been aware of  
10 that problem.

11 Q As you sit here today and as your  
12 recollection is refreshed by this document, what was  
13 the pin problem at the electromatic relief valves at  
14 Oyster Creek?

15 A I cannot tell you any more, other than this  
16 document refreshes something in the back of my memory  
17 that there was a pin problem. I can't understand or  
18 remember exactly what it was.

19 Q Was it your understanding at the time that  
20 the pin problem caused the electromatic relief valve  
21 to fail?

22 A I don't remember.

23 Q Do you remember that there was any  
24 relationship between the pin problem and the operation  
25 of the valve?

2 A I don't remember.

3 Q Was it your understanding that the pin  
4 problem was irrelevant to the operation of the valve?

5 A I don't remember that either.

6 Q In performing your work at TMI-2, did you  
7 make any attempt to check to see whether there were  
8 similar pin problems in the relief valves on that unit?

9 A I don't remember doing that.

10 Q In your work at TMI Unit 1, to your  
11 recollection, did you make any attempt to see whether  
12 or not there were pin problems in the pilot operated  
13 relief valve of that unit?

14 A I don't remember in either Unit 1 or 2, doing  
15 it either way.

16 Q To your knowledge, did you learn of the  
17 pin problem at Oyster Creek at or about the time  
18 that the pin problem occurred?

19 A I don't remember.

20 Q Do you remember where you were when you  
21 learned of the pin problem at Oyster Creek?

22 A I don't remember when I read or knew anything  
23 about this.

24 Q Were you aware, at the time you were  
25 working on the TMI-1 startup, that problems with

2 relief valves, with pilot operated relief valves,  
3 could cause them to fail in operation?

4 MR. GLASSMAN: Are you asking this as a  
5 general question of whether any problem could  
6 cause a failure?

7 MR. STEWART: That's right.

8 MR. GLASSMAN: What time frame?

9 MR. STEWART: I identified the time frame.

10 At the time he was working on TMI-1.

11 A I believe when I was at TMI Unit 1 I had a  
12 feeling that electromatic relief valves could fail.

13 Q Did you continue to have that feeling  
14 during the course of your work at TMI-2 up until the  
15 end of 1978?

16 A I believe that I felt that the valve could fail.

17 Q Did you believe they could fail in an  
18 open position?

19 A I believed that it could fail in an open position  
20 or fail to open.

21 Q Were you aware from any source at the time  
22 you worked at the TMI-1 that pilot operated relief  
23 valves had failed to open at other plants?

24 A I knew that valves had failed open in other  
25 plants.

2 Q That those valves failed open in other  
3 plants?

4 A That electromatic relief valves had failed in  
5 other plants.

6 Q And was it your knowledge that they had  
7 failed in a closed position and in an opened position  
8 at various times?

9 A The instance I remember is during the test  
10 program on Oyster Creek an electromatic relief valve  
11 failed open.

12 Q When was that?

13 A I can't remember.

14 Q Was it while you were working at Oyster  
15 Creek?

16 A Yes.

17 Q What happened when that valve failed open?

18 A I don't remember.

19 Q Was the plant operating at power at the  
20 time the valve failed open?

21 A I don't remember.

22 Q Was it while the plant was undergoing  
23 startup testing?

24 A Yes, it was.

25 Q Do you recall whether or not a particular

2 test was being performed at the time the valve failed  
3 open?

4 A No.

5 Q Do you recall what the response of the  
6 plant was to the failure of the valve in an open  
7 position?

8 A No, I do not.

9 Q Do you recall who it was that manufactured  
10 that valve at Oyster Creek?

11 A I would not have recalled except for the report  
12 that I just read said that the valves at Oyster Creek  
13 were by Dressler.

14 Q At the time you worked at Oyster Creek,  
15 did you know who the manufacturer of the valves was?

16 A Not that I remember.

17 Q Besides yourself, who was working at the  
18 Oyster Creek plant at the time the valve failed open?

19 A I don't remember.

20 Q Who was in charge of plant operations at  
21 Oyster Creek during the time period you worked there?

22 A Tom McCluskey was the plant superintendent.

23 Q Could you spell that?

24 A M-c-C-l-u-s-k-e-y.

25 Q Do you recall who the shift supervisors

2 were at Oyster Creek at the time this PORV failed open?

3 A Who was on shift at that time?

4 Q Yes.

5 A No, I do not.

6 Q Do you recall who the shift supervisors  
7 were in general at Oyster Creek at that time?

8 A Joe Carroll, C-a-r-r-o-l-l; Jim Maloney,  
9 M-a-l-o-n-e-y; John Roth, R-o-t-h; Norman Cole, C-o-l-e.

10 Q Do you know who Mr. Cole now works for?

11 A No, I do not.

12 Q Are you certain that his first name is  
13 Norman?

14 A That is what I remember referring to him as.

15 Q You listed the names of four gentlemen.  
16 Were those all of the shift supervisors at Oyster  
17 Creek at the time you worked there?

18 A There was another one later in time, Marion  
19 Daniels.

20 Q Do you know whether or not one of these  
21 five gentlemen was the shift supervisor on duty at  
22 the time the pilot operated relief valve failed open  
23 in Oyster Creek?

24 A No, I do not.

25 Q Do you know the reasons why the pilot

2 operated relief valve failed open at Oyster Creek?

3 A No.

4 Q How quickly was the failure of the pilot  
5 operated relief valve in an open position at Oyster  
6 Creek detected by the operations staff?

7 A As I remember, it was almost immediately.

8 Q Do you know how the operations staff  
9 determined that the valve had failed in an open  
10 position?

11 A We could hear it.

12 Q How could you hear it?

13 A You could hear the noise.

14 Q What was causing the noise?

15 A The steam through the valve.

16 Q Where was the steam coming from?

17 A Out of the reactor.

18 Q Where was the steam going to from the  
19 valve?

20 A To the torus.

21 Q What is the torus?

22 A It is a vessel that sits under the dry well  
23 under the vessel.

24 Q Do you know of any documents that were  
25 prepared describing the failure of the PORV at Oyster

2 Creek at the time we have been talking about?

3 A No, I do not.

4 Q Was anyone given the task of investigating  
5 that event, to your knowledge?

6 A I don't remember.

7 Q Do you remember whether or not an  
8 investigation was performed?

9 A I don't remember.

10 Q Other than the failure of the PORV at  
11 Oyster Creek which we have just been talking about,  
12 were you aware of any other failures of PORV's at  
13 any other plants prior to the end of 1978?

14 A Not that I remember.

15 Q Do you recall whether the failure of the  
16 PORV at Oyster Creek was the first time you had heard  
17 of a failure of a PORV?

18 A I don't remember that either way.

19 Q Do you remember hearing about the failure  
20 of a PORV at any time following the failure of the PORV  
21 at Oyster Creek at the time we have been talking about?

22 MR. GLASSMAN: I think that has been asked  
23 and answered already.

24 A I don't remember.

25 Q Are you aware of a failure of a PORV at

2 TMI-2 in March 1978?

3 A Yes.

4 (Whereupon, a recess was taken.)

5 BY MR. STEWART:

6 Q I asked you before about a system in the  
7 secondary plant at TMI-2 known as the condensate  
8 polishing system. Are you familiar with that system?

9 A Yes.

10 Q Who was the designer of the system?

11 A Burns & Roe produced the specifications. They  
12 then put that out for bid. The accepted bidder  
13 for that system was L.A. Water Treatment. L.A. Water  
14 Treatment designed the system to the spec that Burns  
15 & Roe issued, and Burns & Roe concurred in the design.

16 Q What equipment comprised the condensate  
17 polishing system at the secondary plant at TMI-2?

18 A The condensate polisher vessels, the valves in  
19 and out of the vessel, the controls to those valves,  
20 and the regeneration station.

21 Q What is condensate?

22 A The steam comes out of the steam generator,  
23 goes through the turbine, and is discharged into a  
24 condenser where it is condensed to water, and the  
25 water is referred to as condensate.

1

2 Q What is the difference between condensate  
3 and feedwater?

4 A The condensate comes out of the hot well, goes  
5 through a set of pumps called the condensate pumps,  
6 through a second set called the condensate booster  
7 pumps, through a third set of pumps called the  
8 feedwater pumps. From that point it is feedwater.

9 Q Would I be correct in saying that  
10 condensate is water?

11 A Correct.

12 Q And feedwater is water?

13 A Yes.

14 Q And all feedwater at some point is  
15 condensate?

16 A That is not true.

17 Q Is there feedwater that is not at some  
18 point condensate?

19 A The heater drain system feeds into the sections  
20 of the feedwater pumps.

21 Q What is the heater drain system?

22 A That is a drain out of the feedwater heaters  
23 on the high pressure end that feed into the feedwater  
24 pump suction, so a combination of the condensate plus  
25 the heater drain would equal the feedwater.

2 Q Is the flow of feedwater through the  
3 secondary plant referred to as a feedwater cycle?

4 A That is part of the secondary plant cycle.

5 Q Is that a correct term to use in describing  
6 the movement of water through the secondary plant?

7 MR. GLASSMAN: Which terminology are  
8 we referring to?

9 MR. STEWART: The feedwater cycle.

10 A That is a common term.

11 Q What percentage of the feedwater is  
12 supplied by the condensate polishing system?

13 A I don't remember.

14 Q Is most of the feedwater supplied by the  
15 condensate polishing system?

16 A Yes.

17 Q How much more feedwater is supplied by  
18 the condensate polishing system than is supplied by  
19 the heater drain?

20 MR. GLASSMAN: If you know.

21 A I don't remember the exact numbers.

22 Q What is your general recollection?

23 A The heater drains could have been as high as  
24 one-third.

25 Q But no higher; is that right?

2 A I don't believe so.

3 Q What was the function of the condensate  
4 polishing system?

5 A To take the contaminants out of the condensate.

6 Q What contaminants in particular was the  
7 system designed to remove?

8 A Sodiums, chlorides, phosphates.

9 Q Why were these contaminants removed from  
10 the secondary system?

11 A To protect the steam generator and to protect  
12 the turbine.

13 Q What would happen to the steam generator  
14 and turbine if the contaminants were not removed?

15 A In the steam generator, the water boils. A  
16 lot of contaminants would concentrate in the steam  
17 generator. They could plate out on the various  
18 surfaces in the steam generator, could create a  
19 chemical attack, or could create thermal problems  
20 due to limitations in heat transfer which would  
21 eventually lead to a steam generator tube leak.

22 Q What would happen to the turbine if the  
23 contaminants were not removed?

24 A The contaminants could go into areas of high  
25 stress on the turbine plating. When combined with

2 stress, they could produce at least one type of  
3 chloride stress corrosion cracking which would lead to  
4 turbine blade, either stationary or rotary, failure.

5 Q If contaminants were not removed from the  
6 secondary plant, how long would it take for the  
7 problems you described in the steam generator and in  
8 the turbine to develop?

9 A There is a wide school of thought on that.

10 Q What is the soonest it is thought to be  
11 able to occur?

12 MR. GLASSMAN: You are asking for his

13 knowledge?

14 A Are you saying if none of the contaminants were  
15 removed?

16 Q Yes.

17 A There were some schools of thought that said it  
18 could occur in days.

19 Q Was there a school of thought that  
20 believed it would take longer for the contaminants  
21 to have the effects you described?

22 A I think it was the opinion of B&W in the steam  
23 generator and the opinion of Westinghouse in the  
24 turbine that it would occur very rapidly.

25 Q That is the school of thought you were

2 referring to a moment ago; is that right?

3 A Yes.

4 Q You mentioned earlier, I believe, a piece  
5 of equipment called the condensate polisher unit;  
6 is that correct? Is there such a piece of equipment?

7 A Yes.

8 Q What is it?

9 A I believe I just defined that for you earlier.

10 Q What was your definition?

11 MR. GLASSMAN: I don't think it is  
12 necessary for the witness to repeat his prior  
13 answer.

14 MR. STEWART: You instruct him not to  
15 answer?

16 MR. GLASSMAN: I will let him repeat it  
17 once to enlighten you if you have forgotten,  
18 but I think you shouldn't make a practice of it.

19 MR. STEWART: Thank you.

20 A It was the polisher vessels themselves, inlet  
21 and outlet valves, the valve controls, and the  
22 regeneration station.

23 Q How many condensate polishers were there  
24 altogether?

25 A There were eight vessels.

2 Q How many were in operation at any one  
3 time under ordinary operating conditions?

4 A If the design was at 100 percent power, seven out  
5 of the eight vessels would be in service.

6 Q Did condensate flow through the condensate  
7 polisher vessels?

8 MR. GLASSMAN: Under what circumstances?

9 MR. STEWART: Ordinary operating  
10 circumstances.

11 MR. GLASSMAN: Assuming Mr. Toole knows  
12 about ordinary operating circumstances.

13 A By design, it should have.

14 Q How did condensate flow into the condensate  
15 polisher vessels?

16 A Through a piece of pipe.

17 Q What was the name of that pipe?

18 A The condensate polisher inlet header.

19 Q Was there only one inlet header for each  
20 vessel?

21 A As I remember, the line split. There were two  
22 headers. I am not sure.

23 Q It is your best recollection there were  
24 two headers for every condensate polisher vessel?

25 A No. I believe there was one header that ran

2 the length of the eight polishers, and a line that  
3 went from the header to each of the polishers.

4 Q When you used the word "header," what  
5 piece of equipment are you referring to?

6 A It is a large piece of pipe.

7 Q Was there a valve on each polisher that  
8 controlled the flow of condensate into that polisher  
9 from the inlet header?

10 A There was a valve that controlled the flow to  
11 the vessel. I am not sure whether it was the inlet  
12 to the vessel or the outlet to the vessels.

13 Q Is it your recollection there was only  
14 one valve on the vessel that controlled flow?

15 A As I remember.

16 Q How was condensate taken from the  
17 condensate polisher vessels?

18 A There was an outlet line that, as I remember,  
19 each of the eight outlet lines tied into an outlet  
20 header.

21 Q To your knowledge, was there a valve on  
22 the outlet lines to control flow from the condensate  
23 polisher vessels?

24 A There was a valve on the outlet, and as I  
25 remember, the outlet valve is the valve that controlled

2 the flow through the polisher.

3 Q That is the proper name for the valve,  
4 the outlet valve?

5 A As I remember it, yes.

6 Q Besides the outlet lines, were there any  
7 other lines for removal of condensate from the  
8 condensate polisher vessels during ordinary operation  
9 of the condensate polishing system?

10 A For ordinary operation, there was one outlet  
11 for each polisher.

12 Q That was the outlet line you described?

13 A Yes.

14 Q Do you have an understanding of the  
15 meaning of the term "maximum power level" as that term  
16 is used to describe the thermal power of nuclear  
17 reactors?

18 A Yes.

19 Q What is your understanding of the meaning  
20 of that term?

21 A That would be the maximum power level allowed  
22 by the technical specifications.

23 Q To your knowledge, what was the maximum  
24 power level of TMI-2 in the plant's original design?

25 A In megawatts thermal?

2 Q Yes.

3 A I don't remember the number.

4 Q Do you remember any number that would  
5 describe the maximum power level of TMI-2 as originally  
6 designed?

7 A The number I remember is 2355 megawatts thermal.

8 Q What does that number signify to you?

9 A That is a number I remember that could have been  
10 the design 100 percent thermal.

11 Q When you say design 100 percent thermal,  
12 do you mean the original design of the plant?

13 A As I remember Unit 2, it had a design thermal  
14 number that at some point in time was changed to a  
15 higher thermal number.

16 Q Would it be fair to say that the maximum  
17 power level of TMI-2 then was raised from one level  
18 to another level?

19 A As I remember, that occurred.

20 Q When was the power level raised?

21 A I don't remember.

22 Q Was it during startup?

23 A As I remember, the power level change had  
24 occurred prior to criticality.

25 Q Was it after you were working on the TMI-2

2 startup?

3 A I think it was before I went to TMI Unit 2, but  
4 I am not positive.

5 Q Was it while you were at TMI Unit 1?

6 A I don't remember exactly when it occurred, but  
7 I think it was while I was at Unit No. 1.

8 Q To your knowledge, was there a change in  
9 design of the condensate polishing system at the time  
10 that thermal power level of TMI-2 was increased?

11 A Not that I remember.

12 Q Did the increase in the maximum thermal  
13 power level of TMI-2 place additional demands on the  
14 secondary plant for heat removal?

15 MR. GLASSMAN: If you know.

16 A An increase in power level in the primary plant  
17 requires more secondary plant capability, yes.

18 Q Would that require more feedwater to be  
19 run to the secondary plant?

20 A The higher the power level, the more feedwater  
21 required.

22 Q To your knowledge, after the power level  
23 at TMI-2 was increased to the higher level, was the  
24 capacity of the TMI-2 condensate polishing system also  
25 increased?

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

MR. GLASSMAN: I think that has been asked and answered, and I also object that the witness testified that he doesn't recall when the power rating was changed. To his recollection, it occurred before he was even there.

MR. STEWART: Can he answer the question?

A As I remember it, there was a review of the secondary plant done prior to the request to B&W to determine if we could increase the power level in the reactor.

Q Who conducted the review?

A I believe Burns & Roe did.

Q Do you know when it was they conducted this review?

A No, I do not.

Q Was it before the maximum thermal power level was increased or after?

A I believe the sequence was that Burns & Roe determined that the secondary plant cycle and the turbine generator could operate at a high power level, and B&W was requested to do a review and determine if the reactor could operate at a higher power level.

Q Did B&W determine that the reactor could

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

operate at the higher level?

A I believe they did.

Q Did the Burns & Roe review which you described result in any document, to your knowledge?

A Not that I remember.

Q Do you recall hearing of or attending any meetings where Burns & Roe was also present where the review of the capacity of the condensate polishing system was also discussed?

A Not that I recall.

Q Do you know who it was that worked with Burns & Roe in conducting this review of the secondary system?

A I don't remember.

Q Do you know who it was from Burns & Roe that worked on this project?

A No, I do not.

Q Within the GPU organization, who would the task of working with Burns & Roe ordinarily have fallen to?

A I don't know when this occurred, so I don't believe I can answer that.

Q By function or title, who would that ordinarily have fallen to?

2 A The function and title changed so many times.  
3 There was a project manager for the Unit No. 1 and  
4 Unit No. 2. It would have fallen under the  
5 jurisdiction of the project manager.

6 Q Who was the project manager for Unit No.  
7 2?

8 A Since I don't know when this occurred, I don't  
9 know who was the project manager at that time.

10 Q I take it there was more than one project  
11 manager at Unit 2.

12 A I believe there was.

13 Q Who were the project managers at Unit 2  
14 that you know of?

15 A I believe the earliest project manager was  
16 George Bierman, B-i-e-r-m-a-n. I don't know if there  
17 was anyone before him or not. I don't remember that.

18 Q After Mr. Bierman, who was the next project  
19 manager?

20 A The next project manager that I remember was  
21 Dick Ewart.

22 Q After Mr. Ewart?

23 A I believe the title of project manager went to  
24 John Barton at some stage of Unit 2.

25 Q Was he the last project manager that there

1  
2 was at TMI-2?

3 A I believe he was.

4 Q To your knowledge, were any changes of any  
5 sort made to the TMI-2 condensate polishing system or  
6 feedwater system as a consequence of the increase in the  
7 TMI-2 reactor's maximum thermal power level?

8 A I don't remember either way, whether there were  
9 changes made in response to that incident.

10 Q If changes were made, what would the  
11 mechanism have been for having such changes made to  
12 the secondary plant?

13 A If it were to involve a piece of vendor's  
14 equipment, the mechanism would have been Burns & R  
15 would have gone to the vendor, provided them a rec  
16 to make a review as to whether the equipment supp  
17 by the vendor could handle the increased capacity  
18 whatever it might be. That vendor would do a re  
19 and provide Burns & Roe the answer or tell Burns &  
20 Roe what would have to be changed to support the  
21 additional capacity.

22 Q If changes were made, would Burns & Roe  
23 issue an engineering change memorandum to effect that  
24 change?

25 A Since I don't know at what time this occurred,

2 I don't know whether they would have or not.

3 Q Was there a time when Burns & Roe first  
4 began issuing engineering change memos?

5 A Yes, there was.

6 Q When was that?

7 A I don't know.

8 Q Before Burns & Roe issued engineering  
9 change memos, was there a document by any other name  
10 that served the same function as engineering change  
11 memos later came to serve?

12 A I don't know.

13 Q To your knowledge, was there an engineer  
14 or any person at Burns & Roe who had responsibility  
15 for working on the TMI-2 secondary plant?

16 A I don't remember who was associated with the  
17 project at the time this was changed because I don't  
18 know when this was changed. I do remember the name  
19 of the project manager at Burns & Roe, and that was  
20 Bob Dodds, D-o-d-d-s.

21 Q Was the subject of possible changes to  
22 the secondary plant in response to the increase in the  
23 TMI-2 maximum power level a subject that was discussed  
24 at meetings of the test working group?

25 A No.

2 Q To your knowledge, did the PORC discuss  
3 this subject?

4 A I don't have knowledge of that either way.

5 Q The General Office Review Board?

6 MR. GLASSMAN: I object to this line of  
7 questioning. We are wasting an awful lot of  
8 time with Mr. Toole. He testified several times  
9 as to his lack of involvement with the PORC,  
10 with the GORB, and no doubt with a number of  
11 other committees or groups which you probably  
12 have on your list. We are just wasting an  
13 awful lot of time going through this and only  
14 prolonging the deposition needlessly.

15 MR. STEWART: It is possible to know what  
16 a committee does without being a member. I  
17 know from time to time what the Cabinet of the  
18 United States is doing, even though I am not a  
19 member of the U.S. Cabinet. Mr. Toole was on the  
20 plant site. He occupied a very responsible  
21 position. I don't think it is inconceivable he  
22 could have been told from time to time what  
23 people on the committees were doing.

24 MR. GLASSMAN: If you would like to ask  
25 him whether he was told something, fine. But

2

I would note, if you were asked whether you had heard anything about a Cabinet meeting, I doubt you would be a good witness or have evidenciary material to testify about. I think your example highlights the absurdity of asking Mr. Toole again and again about things with which he was not directly involved.

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

MR. STEWART: If you think it is absurd,

your complaint lies with whoever drafted

Rule 26, because questions are proper certainly

in terms of relevance if they are calculated to

lead to the discovery of relevant evidence.

MR. GLASSMAN: I am allowing you a lot of

leeway in this area of examination. I hope you

will move on.

Q At any point, did you learn who else or

who at Three Mile Island had any involvement with the

subject of possible changes to the secondary plant

in response to the increase in the maximum power

level of the Unit 2 reactor?

A Not that I remember.

Q Are you familiar with the meaning of the

term operation margin or performance margin, as that

term is used in the context of nuclear engineering?

2 A I am not familiar with that.

3 Q Have you ever heard either of those terms  
4 before?

5 A Not that I remember.

6 Q Do you know of any term that describes  
7 the margin designed into a system above and beyond  
8 the minimum requirements that that system must meet  
9 in the course of its ordinary operation?

10 A I don't know what term I would use at this time.

11 Q Are you familiar with the concept?

12 A I would say that I am familiar with the concept  
13 that some items have more capacity than is required  
14 for their design purpose.

15 Q Have you ever heard the term "reserve  
16 capacity" used?

17 A Yes.

18 Q Is that a term you have ever used?

19 A Reserve capacity is used in the power company  
20 to identify electrical generation that we have  
21 available that is not being used.

22 Q Is that the only context you have heard  
23 that term used in connection with?

24 A That is how I remember using it.

25 Q To your knowledge, was there in the

2 original design of the condensate polishing system  
3 at TMI-2 an allowance for additional capacity in th  
4 system to account for unforeseen plant events above  
5 and beyond the needed capacity of that system in  
6 ordinary operation of the reactor?

7 A To my knowledge, I don't know how the capacity  
8 number of the condensate polisher was arrived at.

9 Q To your knowledge, was there a margin in  
10 the capacity of the condensate polishing system above  
11 and beyond the operational requirements of that  
12 system at ordinary operation of the TMI-2 plant?

13 A To my knowledge, the plant had operated at 98  
14 percent power, and condensate demineralizers had  
15 supported that.

16 Q Was the flow through the condensate  
17 polishing system when the plant was at 98 percent  
18 power the maximum flow possible through that system?

19 A I can't answer that.

20 Q Why not?

21 A Because I didn't look at the unit and determine  
22 how much extra capacity was available at the point in  
23 time of 98 percent power.

24 Q You used the term "extra capacity." What  
25 is your meaning of the term?

2 A As I used it in my statement, you can look at  
3 condensate polishers, and I believe they were designed  
4 for either 24 or 25 hundred gpm. If you followed the  
5 flow rates through to seven vessels, you would come  
6 up with a number something less than seven times 2500.  
7 The difference between those two would be extra  
8 capacity available at that time.

9 Q The difference between what two numbers?

10 A Seven times 2500 minus the sum of the flow of  
11 all seven vessels at the time.

12 Q And the difference in those two numbers  
13 would be extra capacity as you used that term?

14 MR. GLASSMAN: That has been asked and  
15 answered.

16 Q To your knowledge, was there any legal  
17 or administrative requirement requiring extra capacity  
18 to be designed into the condensate polishing system  
19 at TMI-2?

20 A I am not aware of any legal requirement.

21 Q Are you aware of any requirement whatsoever?

22 A The polishers would have been designed for a  
23 flow rate that would have been higher than required  
24 because with fouling, with the Delta P, if not  
25 properly operated, the flow rate could decrease because

2 of the Delta P differential pressure across the resin.

3 Q What is fouling as you used that term?

4 A Suspended solids that would be filtered out by  
5 the polisher resins.

6 Q What types of solids are you referring to?

7 A It would be suspended iron.

8 Q What would the size of the particles  
9 of suspended iron be, microscopic or larger?

10 A It could be visual.

11 Q You used the term "differential pressure,"  
12 or I think you also used the term "Delta P" which is  
13 the same thing. What is differential pressure?

14 A The difference between the inlet pressure and  
15 the outlet pressure.

16 Q Is Delta P or differential pressure also  
17 sometimes called the pressure across a certain area?

18 A Yes, it is.

19 Q To your knowledge, is it sound engineering  
20 practice to design into a particular system extra  
21 capacity?

22 MR. GLASSMAN: Objection. I don't know  
23 if we have established Mr. Toole as an expert  
24 in a particular area, and I don't recall the  
25 question even dealing with a particular piece

2 of equipment or particular instance relating to  
3 TMI. The question is obviously overbroad.

4 MR. STEWART: Let me ask it this way:

5 Q You have trained as an engineer, have you  
6 not?

7 A Yes.

8 Q And you have worked as an engineer for  
9 over ten years; is that correct?

10 A That's correct.

11 Q And in the course of your training and  
12 work as an engineer, have you become familiar with  
13 certain engineering practices?

14 A Yes.

15 Q Do you have an understanding of what are  
16 considered to be sound engineering practices?

17 A I think I do.

18 Q Is it a sound engineering practice to  
19 design extra capacity into a system to account for  
20 unforeseen developments above and beyond the normal  
21 operating demands placed upon that system?

22 MR. GLASSMAN: I object to that question.

23 Mr. Toole certainly had an education, but there  
24 has been no testimony that he was involved in the  
25 design of this or any other system.

2

MR. STEWART: I am asking this as a general matter.

3

4

MR. GLASSMAN: You can ask as background matter, but I note the objection.

5

6

A As I see the industry, most components are designed in sizes, in that you can buy a 50-horsepower motor or a 75-horsepower or 100 horsepower, and you can buy pipe sizes that are six, 12 or 24 inches, and sound engineering practice is that you usually apply a size that is as big or bigger than what you need.

7

8

9

10

11

12

Q Why is this done?

13

A If it was smaller than what you needed, you wouldn't be able to satisfy the purpose of the system.

14

15

16

Q To your knowledge, is there any requirement imposed by the American Nuclear Society or the American Society of Mechanical Engineers having to do with the extra capacity needed in systems of nuclear plants?

17

18

19

20

21

A Not that I remember.

22

23

24

Q Do you have any knowledge of whether such a requirement exists, regardless of what the requirement is?

25

A Not that I remember.

1  
2 Q To your knowledge, was there an extra  
3 capacity in the TMI-2 condensate polishing system as  
4 it was originally designed?

5 MR. GLASSMAN: I think it has been asked  
6 and answered at least a few times. I direct the  
7 witness not to answer this. We have been through  
8 this a couple of times. We have to get this  
9 examination on with.

10 MR. STEWART: In that case, I think you  
11 should have seen to it that the witness would  
12 be available for more than two days at a time.

13 Q Was the extra capacity of the condensate  
14 polishing system greater or less after the maximum  
15 power level of the TMI-2 reactor was increased to  
16 a higher level?

17 MR. GLASSMAN: I am not sure I understand  
18 the question.

19 Could the reporter please read it back.  
20 The witness can answer it if he understands it.

21 (Record read.)

22 A It would have been less.

23 Q Are you familiar with the meaning of the  
24 term "full flow," as that term is applied to the  
25 condensate polishing system?

1  
2 A There was a number which I believe was 2500 gpm  
3 which was considered full flow.

4 Q You had testified yesterday, I believe,  
5 that in the course of your training in 1973 in  
6 preparation for the TMI-1 startup, among the subjects  
7 covered in the course was the condensate polishing  
8 system at TMI-1; is that correct?

9 A That's correct.

10 Q Did you come to have an understanding of  
11 the design of the condensate polishing system at  
12 TMI-1 as a result of that course?

13 THE WITNESS: Would you read the question  
14 back prior to that question.

15 (Record read.)

16 A As an answer to the two previous questions,  
17 Unit No. 1 did not have a condensate polishing system.

18 Q In its secondary plant?

19 A In its secondary plant.

20 Q Did it have any system for demineralizing  
21 condensate or feedwater?

22 A It had a condensate cleanup system which was a  
23 Powdex system.

24 Q What was the function of the condensate  
25 cleaning system at TMI-1?

2 A To clean the contaminants out of the condensate.

3 Q Were these the same contaminants that the  
4 condensate polishing system at TMI-2 was designed to  
5 remove?

6 A I am not sure.

7 Q Was the steam generator at TMI-1 the same  
8 in design as the steam generator at TMI-2?

9 A I believe it was.

10 Q To your knowledge, were the corrosion and  
11 other problems you described earlier this morning as  
12 being problems presented at TMI-2 by the failure to  
13 demineralize condensate also present at TMI-1?

14 A As I remember, the feedwater requirements as  
15 supplied to us by E&W were the same for Unit No. 1,  
16 and the anticipated chemical corrosion problems were  
17 the same.

18 Q Was the condensate cleaning system at  
19 TMI-1 therefore designed to remove, at least in part,  
20 the same impurities as the condensate polishing system  
21 at TMI-2?

22 A It was designed to produce the same feedwater  
23 quality.

24 Q And how would it produce the same feedwater  
25 quality?

1

2 A By removing contaminants from the condensate.

3 Q And to produce feedwater of the same  
4 quality, was it necessary for it to remove the same  
5 contaminants?

6 A No.

7 Q What contaminants were removed at TMI-2  
8 that were not removed at TMI-1?

9 A In Unit No. 2, we used acid and caustic to  
10 regenerate the condensate polisher. This acid and  
11 caustic contains contaminants that can be left in the  
12 system. These contaminants could be different than  
13 what occurs in Unit No. 1, simply because it is done  
14 differently in Unit No. 1.

15 Q You testified earlier, among the  
16 contaminants removed were certain sodiums and certain  
17 chlorides; is that correct?

18 A Yes.

19 Q Were those also contaminants that were  
20 removed at TMI-1?

21 A I believe so.

22 Q Is it your testimony, in addition to the  
23 removal of these contaminants, the condensate polishing  
24 system at TMI-2 added certain acids and caustics to  
25 the feedwater?

2 A It had the potential to.

3 Q To your knowledge, did it ever do so?

4 A To my knowledge, we did not take a sample of the  
5 feedwater and say these contaminants resulted from  
6 the regeneration of condensate polishers.

7 Q To your knowledge, were the caustics and  
8 acids that you described a beneficial or detrimental  
9 addition to the feedwater at TMI-2?

10 A When regenerated properly, they would not have  
11 been an addition to the Unit No. 2 feedwater.

12 Q If they were added to the Unit 2 feedwater,  
13 would it enhance or deter from the performance of the  
14 steam generators?

15 A The acid we used for regenerating the condensate  
16 polisher, if added to the feedwater, had the potential  
17 for damage to the steam generator.

18 Q And that acid was not used in the TMI-1  
19 condensate cleaning system; is that correct?

20 A That's correct.

21 Q Do you have a general familiarity with  
22 the condensate cleaning system at TMI-1?

23 A Yes.

24 Q Does all condensate in each cycle through  
25 the plant go through the condensate cleaning system at

2 TMI-1?

3 A TMI-1 is very similar to TMI-2 in that the  
4 condensate comes out, flows through the condensate  
5 Powdex vessels, goes on up, and at the point of the  
6 feedwater pump suction, the heater drain system pumps  
7 into the Unit 1 feedwater pump suction, so feedwater  
8 in Unit 1 is the sum of condensate plus heater drain  
9 flow.

10 Q And in Unit 2, is feedwater also the sum  
11 of condensate and heater drain flow?

12 A Yes.

13 MR. GLASSMAN: Mr. Toole has just testified  
14 to the same question twice again. The last  
15 question was asked earlier and answered in the  
16 same manner.

17 Q Was the proportion of condensate to  
18 heater drain flow at TMI-1 the same as it was at  
19 TMI-2?

20 A I don't remember.

21 Q Do you have a general recollection of the  
22 proportion?

23 A In general, they were probably pretty close.  
24 The difference in the GE turbine and the Westinghouse  
25 turbine could have made that a considerable difference,

2 but I am not sure.

3 Q Do you know of any document that would  
4 state what the proportion of heater drain flow to  
5 condensate flow was in TMI-1?

6 A The information would be available. I am not  
7 sure where it would be at.

8 Q If you were to search for that information,  
9 what document would you first look at?

10 A I would look in the Training Department documents.

11 Q What documents in particular would you  
12 search for?

13 A I would look for the feedwater condensate and  
14 heater drain training documents.

15 Q Would those documents be part of a  
16 larger document or manual?

17 A I don't know exactly what the breakdown is.

18 Q Did you ever hear the term "half flow"  
19 used to describe the condensate cleaning system at  
20 TMI-1?

21 A I am not familiar with that.

22 Q Have you ever heard the term before as  
23 used to describe the TMI-1 condensate cleaning system?

24 A Not that I remember.

25 Q To your knowledge was it in the design of

2 the TMI-1 condensate cleaning system that something  
3 less than 100 percent of the condensate through that  
4 system would travel through the condensate cleaning  
5 vessels?

6 MR. GLASSMAN: I object. The question  
7 seems to talk about condensate polishing in  
8 TMI-1, and the witness has testified previously  
9 that there was no condensate polishing system.  
10 No foundation for the question.

11 Q Do you understand the question?

12 A I think what you asked me is, would the  
13 condensate Powdex system in Unit 1 operate with less  
14 than 100 percent design flow, and the answer is yes.

15 Q In the course of travelling through the  
16 condensate cleaning system at TMI-1, did all condensate  
17 travel through the condensate Powdex vessels?

18 A I believe it does.

19 Q At TMI-2, in the condensate polishing  
20 system, does all condensate flow through the condensate  
21 polishing vessels?

22 A I believe it does.

23 Q Have you ever heard the term "full flow"  
24 used to describe this flow through the condensate  
25 polishing vessels?

1  
2 MR. GLASSMAN: We are talking of TMI-2.

3 MR. STEWART: Yes.

4 A When you refer to full flow demineralizers,  
5 you mean all flow goes through the demineralizer.  
6 It does not bypass it.

7 Q Is that your understanding of the meaning  
8 of the term "full flow" as used with reference to  
9 demineralizers?

10 A Yes.

11 Q Do you have an understanding of the meaning  
12 of the term "half flow" as used with respect to  
13 demineralizer?

14 A I am not familiar with that term.

15 Q Have you ever heard it before?

16 A I don't remember hearing that before.

17 Q I take it you have no understanding of the  
18 meaning of that term as that term is used with  
19 reference to the demineralizer system; is that correct?

20 A I am not familiar with that.

21 MR. GLASSMAN: The witness has answered  
22 again. We are getting repetitive.

23 Q What was the medium used at the TMI-1  
24 condensate cleaning system to remove impurities from  
25 condensate?

1

2 A Powdex is a mixture supplied by the Powdex  
3 Company that is mixed and placed inside the vessel.

4

Q Is there a material known as Powdex?

5

A There is a material that I would consider  
6 Powdex.

7

Q This was the material that was put inside  
8 the vessels, is that right, at TMI-1?

9

A Yes.

10

Q Was that material regenerated after it  
11 was exhausted?

12

A No.

13

Q In the condensate polishing vessel at  
14 TMI-2, what medium was used to remove impurities from  
15 condensate?

16

A It was a resin.

17

Q Did the resins from time to time become  
18 exhausted?

19

A Yes.

20

Q What happened when they became exhausted?

21

A They were regenerated.

22

Q How were they regenerated?

23

A By separating them out to anion and cation and  
24 injecting acid and caustic.

25

Q Were the resins removed from the polisher

2 vessels for purposes of regeneration?

3 A Yes.

4 Q Where were they moved to?

5 A Regeneration station.

6 Q Was there a particular piece of equipment  
7 in the regeneration station into which the resins  
8 were placed?

9 A Yes.

10 Q What was the name of that piece of  
11 equipment?

12 A I believe it was a receiving tank.

13 Q How were resins removed from the condensate  
14 polishing vessels to the receiving tank?

15 A They were sluiced out.

16 Q What was done to the resins in the  
17 receiving tank?

18 A They were backwashed, which in the process of  
19 backwashing you would separate the resins because one  
20 is heavier than the other. Then on a time sequence,  
21 acid would be injected into the vessel at one location  
22 and taken out at another. You would regenerate half  
23 the bed. Caustic would then be added in one location  
24 and taken out the other and regenerate the other bed.

25 Q All of this took place at the regeneration

2 station; is that right?

3 A Yes.

4 Q When the resins had been regenerated,  
5 were they put back into the condensate polishing  
6 vessels?

7 A There was another step in that they were  
8 ammoniated before they were put back into the polisher.

9 Q After all these steps had been taken,  
10 were the resins as good as new for purposes of  
11 removing contaminants from the condensate?

12 A If done properly, when you say as good as new,  
13 they were well regenerated resins.

14 Q At that point, they were put back into  
15 the condensate polisher vessels?

16 A Yes.

17 Q What was the name of the line that was  
18 used to remove the resins from the condensate polishing  
19 tank?

20 A I don't remember a name for that line.

21 Q Did you have a name by which you called  
22 that line?

23 A I don't remember what I called that line.

24 Q Was that also the line used to put the  
25 resins back into the condensate polishing vessels?

2 A As I remember, there was a line to sluice the  
3 resins out. I am not sure if there was one line to  
4 sluice it out and one to sluice it back or whether  
5 there was just one line for both.

6 Q When the resins were sluiced out of the  
7 polishers, however, I take it, they were only sluiced  
8 out through one line; is that right?

9 A As I remember, there was a line that ran from  
10 the polisher to the receiving tank.

11 Q When resins were removed from the  
12 condensate polishing vessels, was something called  
13 fluffing air used?

14 A Air was used, yes.

15 Q Did you ever hear the term "fluffing air"  
16 used?

17 A I believe that was the term that was used, yes.

18 Q What was fluffing air?

19 A Fluffing air was not used as a term to transfer  
20 the resin out. The air to transfer the resin out was  
21 agitation air to stir it up. The term "fluffing" was  
22 used once the resin was in the regeneration tank, and  
23 if you put air in, you could keep the resin separated  
24 while you backwashed it.

25 Q What was agitation air?

2 A Where did it come from?

3 Q What was it? Was it pressurized air?

4 A Yes.

5 Q Was it common air or a particular type of  
6 gas?

7 A I believe it was air from the service air system.

8 Q And where did the service air system draw  
9 air from?

10 A The service air compressors took atmospheric  
11 air and pumped it up to pressure.

12 Q Where did the agitation air enter the  
13 condensate polishing vessels?

14 A I believe at the bottom.

15 Q Was there a line or lines that introduced  
16 agitation air into the condensate polishing vessels?

17 A As I remember, there was a line that came down  
18 that had a supply to each one of the individual  
19 vessels at the bottom.

20 Q There was only one line per vessel?

21 A Yes.

22 Q Were these agitation air lines part of  
23 the original design of the TMI-2 condensate polishing  
24 vessels, or were they added after a time when the  
25 vessels were installed in the plant?

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

MR. GLASSMAN: If you know.

A As I remember it, either the line as it existed was added, or it was increased in size from the original design.

MR. STEWART: Can we have marked as the next exhibit in order a document consisting of a number of pages. The first page is entitled "Burns & Roe Inc. Field Questionnaire No. 1577." It bears the date February 19, 1977.

(Multipage document, first page entitled "Burns & Roe Inc. Field Questionnaire No. 1577," dated February 19, 1977, was marked Defendants' Exhibit 164 for identification, as of this date.)

Q Have you had an opportunity to look at Defendants' Exhibit 164 for identification?

A Yes, I have.

Q What is this document?

A It is Field Questionnaire No. 1577, Rev. 1.

Q Have you seen this document before?

A Yes, I have.

Q When did you first see this document?

A I believe I first saw this in February or March 1977.

Q In other words, at or about the time it was

2 prepared?

3 A Yes.

4 Q How was it that this document came to your  
5 attention?

6 A It was normal practice in the Startup Group to  
7 discuss open field questionnaires, because they were  
8 normally problems that we had defined that we  
9 encountered while testing a system.

10 Q To your knowledge, who prepared this  
11 document?

12 A It is written on here that Tom Hawkins prepared  
13 this.

14 Q Who did Mr. Hawkins work for?

15 A He reported to me.

16 Q And he worked for GPUSC?

17 A Correct.

18 Q Did personnel of GPUSC prepare and submit  
19 field questionnaires to Burns & Roe in the regular  
20 course of business?

21 A Yes.

22 Q To your knowledge, did Mr. Hawkins  
23 prepare this field questionnaire in the regular course  
24 of business?

25 MR. GLASSMAN: If you know.

2 A I believe he prepared this. This is his  
3 handwriting.

4 Q What is the question or problem raised in  
5 Mr. Hawkins' field questionnaire?

6 MR. GLASSMAN: Objection. The document  
7 certainly, page 1, has Mr. Hawkins' signature on  
8 it. The question or problem appears there in  
9 plain English, and I don't see any purpose to  
10 be served by Mr. Toole repeating what is stated  
11 there.

12 Q Were you aware of his question or problem  
13 before the time Mr. Hawkins submitted this field  
14 questionnaire?

15 A I don't remember that either way.

16 Q At any time, did you learn Mr. Hawkins'  
17 reasons for submitting this field questionnaire?

18 A I think I know why this was submitted, yes.

19 Q Why was it submitted?

20 MR. GLASSMAN: Is it clear  
21 that the question, why was it submitted, the  
22 answer should be restricted to the witness's  
23 knowledge?

24 MR. STEWART: I withdraw the question.

25 Q How did you come to have knowledge of the

2 reasons that document was submitted?

3 A I believe that what happened was we had the  
4 resin in a polisher tank, and we were performing a  
5 test of the transfer of the resin from the polisher  
6 tank to the regeneration station, and when we  
7 attempted to do that, we did not remove all the resin  
8 from the condensate polishing vessel.

9 Q Why was it that all resin was not removed  
10 from the condensate polishing vessel?

11 A At the point in time that this occurred, we  
12 felt that we didn't get enough agitation with the  
13 water flow that we had.

14 Q You have been describing the transfer of  
15 resin from a condensate polishing vessel. Was this a  
16 process you were personally involved in?

17 A As I remember, this was demonstrated to me.

18 Q So you saw it firsthand?

19 A Yes.

20 Q What was the reason Mr. Hawkins submitted  
21 this field questionnaire?

22 MR. GLASSMAN: If you know Mr. Hawkins'  
23 state of mind. I object to the question. If  
24 Mr. Hawkins told Mr. Toole why he submitted  
25 this --

2 Q To your knowledge, what was the reason  
3 Mr. Hawkins submitted this field questionnaire?

4 A If the air inlet to the bottom of the tank would  
5 give us some extra agitation to keep the resin moving,  
6 we thought that would possibly help in transferring  
7 the resin out of the tank. We had a similar system  
8 at Oyster Creek, and as we remembered, it used air.  
9 Therefore, our reasoning was that we thought we could  
10 add air, agitate the resin, and in the process of  
11 agitating it and adding water, we would be able to  
12 sluice it out of the tank. Our mode of operation was  
13 to request a design change from Burns & Roe, who would  
14 review it, and they were the engineer who would approve  
15 the change prior to it being made and issue the  
16 engineering to make the change.

17 Q What action was taken in response to  
18 Mr. Hawkins' field questionnaire?

19 A As I read this field questionnaire, it says that  
20 we connected a three-quarter inch line from the  
21 service air system to each of the condensate polishers.

22 Q When was that done?

23 A This field questionnaire, although I can't read  
24 the year, looks like 4/27, and I would believe that  
25 the year is '77.

2 Q Who actually did the work involved in  
3 adding agitation air to the condensate polishing  
4 vessel?

5 A The physical piping would have been done by  
6 crafts who worked for United Engineers.

7 Q Under whose supervision would those  
8 individuals work?

9 A It could have been either under the supervision  
10 of Kakarla, who was in charge of the United Engineers  
11 Startup Group which reported to me, or they could  
12 have requested that would have been done by United  
13 Engineers' piping organization.

14 Q Did you personally review Mr. Hawkins'  
15 field questionnaire before the change was made?

16 A I had seen this before the change was made.

17 Q Is the document you saw substantially  
18 identical to Defendants' Exhibit 164?

19 A Yes, it was.

20 Q To your knowledge, is it different in any  
21 way?

22 A It didn't differ one way or the other, to my  
23 knowledge.

24 Q Was Mr. Hawkins' field questionnaire  
25 reviewed by the test working group?

2 A Not to my knowledge.

3 Q Do you know of any review group that  
4 reviewed this field questionnaire?

5 A No.

6 Q To your knowledge, did a DOT group review  
7 this questionnaire?

8 A Not to my knowledge.

9 Q I direct your attention to the second page,  
10 to about the fifth or sixth line down. There is a  
11 line that reads "GPU Test Superintendant approval."

12 Whose signature appears on that line?

13 A That appears to be Tom Hawkins' signature.

14 Q He signed it on your behalf?

15 A Yes.

16 Q Had you approved it by this time, to your  
17 knowledge?

18 A What Tom Hawkins was approving was the retest  
19 requirements.

20 Q Was that all he was approving?

21 A Yes.

22 Q Whose approval was required before the  
23 change could be made?

24 A Burns & Roe's approval.

25 Q Do you see evidence of that approval

2 appearing anywhere on this document?

3 A The piece of paper, TMI Unit No. 2, Burns & Roe,  
4 Incorporated Engineering Change Memo, Serial No.  
5 S-4562, is a Burns & Roe document, and it is approved  
6 near the bottom by the Burns & Roe site project  
7 manager or project engineer.

8 Q Is the page you have been referring to  
9 the third page of this document?

10 A Yes.

11 Q In the lower right-hand corner, does your  
12 name appear?

13 A Yes.

14 Q Who was the discipline superintendent?

15 A As the words say, discipline superintendent  
16 responsible for implementation.

17 Q Was there more than one discipline  
18 superintendent?

19 A Yes.

20 Q What was a discipline superintendent?

21 A He was the superintendent of the discipline  
22 who would make this change.

23 Q In this case, was the discipline the  
24 Startup and Test Group?

25 A Yes.

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

Q I think you stated at some point the agitation air line was installed on the condensate polishing vessels; is that correct?

A Yes.

Q What was the source of the agitation air as it was installed on the vessels?

A Service air.

Q And I direct your attention to the first page of this document, and to the written words following the title "Question Problem." Have you testified that those words were written by Mr. Hawkins, to the best of your knowledge?

A It appears to be Mr. Hawkins' handwriting.

Q I direct your attention to the second sentence that he wrote in this section. It says: "Provide a permanent source of instrument or service air to the bottom of each condensate polisher tank."

Did Mr. Hawkins suggest that either instrument or service air could be used as agitation air?

A That is what it appears.

Q Do you remember discussing with Mr. Hawkins whether or not instrument or service air would be used?

A No, I do not.

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

Q Do you know why service air instead of instrument air was used as agitation air in the condensate polisher vessels?

A I am not sure.

Q Is the pressure of service air higher or lower than the pressure of instrument air?

A I believe it is the same.

Q Was the source of service and instrument air the same?

A There were service air compressors, and there were instrument air compressors. There was a method by which they could all be tied together, and they would be common.

Q In the ordinary course of operating the plant, were they all tied together?

A As I remember, they were.

(Whereupon, at 12:15 p.m. a lunch recess was taken.)

## AFTERNOON SESSION

2:05 p.m.

RONALD J. TOOLE, resumed.

EXAMINATION (continued)

BY MR. STEWART:

Q You testified earlier today that periodically resins in the TMI condensate polishing system were regenerated; is that correct?

A Yes, that's correct.

Q This regeneration was performed in a piece of equipment known as a regeneration tank; is that correct?

A I believe it was called a holding tank.

Q And there was a pipe or line connecting the condensate polishing vessels to the regeneration holding tank, I believe you also testified.

A I said that there was either one or two lines. I wasn't sure.

Q And it was through those lines that resins were transferred from the condensate polishing vessels to the regeneration holding tank?

A That's correct.

Q I believe I asked you earlier whether or not you knew of the name of those lines, and your

2 response was you didn't know of a name by which  
3 those lines were known; is that correct?

4 A I said I didn't remember what the name of the  
5 lines were.

6 Q Do you remember any name you ever used in  
7 describing those lines?

8 A No, I don't.

9 Q Would it be accurate to call them resin  
10 transfer lines?

11 A Yes.

12 Q As part of the regeneration of resins in  
13 the condensate polishing system, were all the resins  
14 in a given polisher transferred via the resin transfer  
15 line to the regeneration holding tank?

16 A That is the way it was supposed to be done, yes.

17 Q In fact was that the way it was done?

18 A Since I didn't see it done every time, I can't  
19 say that.

20 Q Do you know of any other means resin  
21 transfer could be done other than by having the  
22 resin taken through the resin transfer lines to the  
23 regeneration holding tank?

24 A That was the design method to do it.

25 Q To your knowledge, did it sometimes happen

2 that resins became clogged in the resin transfer lines?

3 A Yes, it did.

4 Q How frequently did this occur, to your  
5 knowledge?

6 MR. GLASSMAN: What time period are you  
7 talking about?

8 MR. STEWART: Prior to the accident.

9 A I cannot define a frequency.

10 Q How many times did you hear of it happening?

11 A I don't remember.

12 Q Did you hear of it happening more than  
13 once?

14 A Yes.

15 Q When was the first time you heard of it  
16 happening?

17 MR. GLASSMAN: If you recall.

18 A I don't remember exactly when it occurred.

19 Q Do you know whether or not there was a  
20 procedure to be followed by plant personnel for  
21 dislodging or removing resin plugs in the resin  
22 transfer lines?

23 A I don't know if that was specifically defined  
24 in the procedure or not.

25 Q Were you aware of the manner in which

1  
2 resin plugs were removed or dislodged from the resin  
3 transfer lines?

4 A I am familiar with the method to do it, yes.

5 Q What is the method you are familiar with?

6 A Water pressure could be raised high enough to  
7 force it through the lines.

8 Q How is water pressure raised?

9 A By applying pressure from a source which  
10 supplied normal or more than water pressure.

11 Q Was the pressure accumulated in the  
12 condensate polisher vessels?

13 MR. GLASSMAN: Objection. I am not sure  
14 I understand the question when you say was the  
15 pressure accumulated. I don't know what you  
16 are talking about.

17 Q Is it your testimony that water pressure  
18 would be used to dislodge or remove the resin plug?

19 A Yes.

20 Q Would the pressure be applied to the  
21 condensate polisher vessel?

22 A I don't remember an incident where the resin  
23 plugged in the line when being transferred from the  
24 polisher to the regeneration station.

25 Q What is your recollection in terms of the

1 resin becoming plugged?

2  
3 A The incident that I remember specifically, and  
4 the only one that I remember ever determining which  
5 way the resin was being transferred, was from the  
6 regeneration station to a demineralizer.

7 Q Do you recall ever hearing about plugs  
8 occurring in the transfer of resins from the vessel  
9 to the regeneration holding tank?

10 A I don't remember either way.

11 Q One way or the other?

12 A Right.

13 Q You have testified or you have mentioned  
14 that one means of removing resin plugs from the  
15 resin transfer line would be to apply water under  
16 pressure; is that correct?

17 A Yes.

18 Q And I believe you also testified that you  
19 knew of no other procedure for removing resin plugs;  
20 is that correct?

21 A What I said is I didn't know whether the  
22 procedure identified that or not.

23 Q Do you know of any other manner in which  
24 resin plugs could be removed other than that that you  
25 just described?

A Yes, the line could be disassembled.

1

2

Q And in addition to that, any method by which resin plugs could be removed?

3

4

A Not that I remember.

5

6

Q To your knowledge, was the piping in the resin transfer system ever disassembled to remove a resin plug?

7

8

A Not that I remember.

9

10

11

Q What was the source of the pressurized water that you referred to a minute ago as being used in removing resin plugs from the resin transfer lines?

12

13

A I don't remember specifically what that arrangement was.

14

15

Q Do you recall what pressure the water was under?

16

A No, I do not.

17

18

Q Do you recall the origin of the water?

19

20

21

MR. GLASSMAN: Objection. I am not sure what the difference is between the words origin and source. It seems to me that question has been asked and answered.

22

23

MR. STEWART: Let's see if he can answer it.

24

25

A I believe the normal supply to transfer the resin came from the demineralized water system.

2 Q Is that the Unit 1 or Unit 2 demineralized  
3 water system?

4 A In Unit 2, the piping system was the Unit No. 2  
5 demineralized water system.

6 Q I believe you testified yesterday that  
7 to your knowledge, the Unit 2 demineralized water  
8 system had not been tested as part of the startup  
9 and test program before the accident at Three Mile  
10 Island in March 1979. Is that correct?

11 A What I testified yesterday is that the Unit No.  
12 2 makeup demineralizer was never tested.

13 Q It was just the makeup demineralizer?

14 A That's correct.

15 Q On the primary side?

16 A It does not apply either to primary or secondary  
17 side. The makeup demineralizer makes the demineralized  
18 water which goes into a tank which then supplies the  
19 demineralized water system which distributes the  
20 demineralized water throughout the plant.

21 Q So it would be that tank that supplied the  
22 demineralized water we have been talking about in  
23 the past few minutes; is that correct?

24 A Yes.

25 Q And that the demineralized water used was

2 produced by the makeup demineralized water system;  
3 is that right?

4 A Yes. Unit No. 1 makeup demineralized water  
5 system supplied the water to the storage tank.

6 Q And the Unit 2 makeup demineralized water  
7 system was not the source of the water put into the  
8 storage tanks?

9 A That's correct.

10 Q Was the water under pressure in the  
11 storage tank?

12 A Yes.

13 Q What was the pressure, if you know?

14 A There could be different combinations of  
15 pressure, depending on whether you were dealing  
16 from the head developed by the tank or the  
17 demineralized water pumps.

18 Q What was the head developed from the tank?

19 A It depends on how high the water was in the tank.

20 Q What was the head developed by the  
21 demineralized water pumps?

22 A I don't remember.

23 Q Do you know any document where that  
24 figure would be recorded?

25 A Not specifically.

2 Q If you had to find that number, where  
3 would you look?

4 A A Burns & Roe system description.

5 Q I take it the demineralized water system  
6 is a Burns & Roe designed item; is that correct?

7 A In Unit 2.

8 Q You have used the term "sluiced water"  
9 at various points in your testimony today. What does  
10 the term "sluiced water" mean?

11 A The water was demineralized water. Sluicing  
12 goes with the evolution in that the resin is being  
13 sluiced from one vessel to another.

14 Q So it would be fair to say that sluiced  
15 water is demineralized water?

16 A Yes.

17 Q And is demineralized water used to transfer  
18 resins from the condensate polisher vessels?

19 A To or from the regeneration station?

20 Q To the regeneration station.

21 A Or back.

22 Q You testified this morning that the Oyster  
23 Creek Station used agitating air in the process  
24 of transferring resins from condensate polishers;  
25 Is that correct?

2 A That is what I think I remembered.

3 Q Did the Oyster Creek Station also use  
4 sluiced water in transferring resins?

5 A Yes.

6 Q Who was the designer of the Oyster Creek  
7 condensate polishing system, if you know?

8 A Burns & Roe was the design engineer.

9 Q To your knowledge, was the design of the  
10 Oyster Creek condensate polishing system similar to  
11 that of the FMI-2 condensate polishing system?

12 A The Oyster Creek condensate demineralizer  
13 was manufactured by Cochran.

14 Q Were the resins in the Oyster Creek  
15 condensate polishing system also regenerated  
16 periodically?

17 A Yes.

18 Q Were you ever told by anyone that resin  
19 plugs had formed in the resin transfer lines connecting  
20 the Oyster Creek condensate polishing vessels to the  
21 regeneration tank?

22 A We had resin plugs in the line at Oyster Creek  
23 while I was there. I don't remember exactly what year.

24 Q Did it happen more than once, to your  
25 knowledge?

2 A I am not sure.

3 Q How did you learn that resin plugs  
4 occurred in the transfer lines at Oyster Creek?

5 A I was there.

6 Q Who told you?

7 A I don't remember.

8 Q You were told by someone though; is that  
9 correct?

10 A Yes.

11 Q Was there a pipe that was used to  
12 introduce sluiced water into the condensate polishing  
13 vessels?

14 A Where?

15 Q At TMI-2.

16 A The water came in through a pipe, yes.

17 Q Right into the vessels; is that correct?

18 A I don't remember the water arrangement.

19 Q Do you remember that the water was  
20 emptied into the vessel?

21 A Which way are you transferring the resin now?

22 Q I am not asking you about transferring the  
23 resins. I am asking whether or not there was a pipe  
24 that introduced sluiced water into the condensate  
25 polishing vessels.

2 A There was a method to get water through a pipe  
3 into the demineralizer that would be used to sluice  
4 the water out, yes.

5 Q What was the name of the line that  
6 introduced the sluiced water into the condensate  
7 polishing vessels?

8 A I don't remember a name for that line.

9 Q Was there a valve that regulated the flow  
10 of sluiced water into the condensate polishing vessels?

11 A I don't remember.

12 Q One way or another?

13 A No.

14 Q Earlier today, you testified about  
15 service air and about instrument air; is that correct?

16 MR. GLASSMAN: Let's get on with the  
17 questioning. Obviously there was some testimony  
18 in this area.

19 MR. STEWART: Can he answer it?

20 MR. GLASSMAN: It is a waste of time,  
21 but go ahead.

22 A I testified we had service air and instrument  
23 air systems.

24 Q Under what pressure was the air in those  
25 systems kept?

2 A I don't remember.

3 Q Do you have any recollection whatsoever  
4 of the pressure?

5 A It was about 100 pounds.

6 Q Was the agitation air at the time it was  
7 introduced into the condensate polishing vessels  
8 pressurized to 100 pounds per square inch?

9 A No, I don't know what pressure the system ran  
10 at for sure, and I don't know what pressure would be  
11 at that point.

12 Q Was the agitating air under the same  
13 pressure as the station service air, if you know?

14 A I testified before that station service air and  
15 instrument air ran at the same pressure.

16 Q What about agitating air?

17 A I don't know what the pressure was of the  
18 agitating air.

19 Q Do you know whether it was greater or  
20 less than that of the service air?

21 A It had to be less than service air.

22 Q Why would it have to be less than service  
23 air?

24 A Because service air was at a pressure, and there  
25 was line loss from the service air header to the point

1

2 where the air went into the demineralizer.

3

Q To your knowledge, was the pressure of the  
4 instrument air system above or below that of the  
5 service air system or about the same?

6

A This is the third time I told you that today.  
7 They were the same.

8

Q Do you recall whether or not the pressure  
9 of the sluiced water that was introduced into the  
10 condensate polishing vessel was greater or less than  
11 that of the agitating air?

12

A I am not sure.

13

Q What is your best recollection?

14

A I think the water pressure was higher -- was  
15 lower than the air.

16

Q You believe the water pressure was lower  
17 than the air; is that your testimony?

18

A I am not sure. I forget whether we injected  
19 the air into the stream of water or whether it was  
20 injected separately. I don't remember which is the  
21 case.

22

Q Injected into what separately?

23

A I don't remember whether the air was injected  
24 into the water line that was running into the vessel  
25 or whether both the air and the water were injected

2 into separate points in the vessel.

3 Q You testified a while ago that one means  
4 of removing resin plugs from the resin transfer line  
5 was to apply pressurized water, at least when the  
6 resin plug occurred in the line when resins were  
7 being placed back in the condensate polisher vessels  
8 from the regeneration holding tank. Did you know of  
9 any procedure other than that for removing resin plugs  
10 when they occurred in the process of transferring  
11 resins to the regeneration holding tank?

12 MR. GLASSMAN: Asked and answered again.  
13 I don't know why we are wasting so much time  
14 repeating the morning testimony and testimony  
15 of a couple of minutes ago and asking the same  
16 question over and over again.

17 MR. STEWART: I don't think it was the  
18 same question.

19 MR. GLASSMAN: He is permitted to answer,  
20 but I think it is the same question and answer.  
21 We are doing a lot of repetitive work.

22 Q Can you answer the question?

23 A You could mechanically disassemble the line.

24 MR. STEWART: Could I have the question  
25 reread.

2

(Record read.)

3

4

5

6

7

Q Was applying pressure to resin plugs in the resin transfer lines a means of dislodging those plugs when they occurred in the process of removing resins from the condensate polishing vessels to the regeneration holding tank?

8

A I don't remember a procedure that defined that.

9

Q Was that a method of removing resin plugs?

10

A If a resin was plugged in a line, it wouldn't matter which way you were trying to make it go. By applying pressure on either side would make it go.

11

12

13

Q Was there a vent installed on condensate polishing vessels?

14

15

A I don't remember.

16

17

18

19

20

Q To your knowledge, when resins were transferred from the condensate polishing vessels to the regeneration holding tank, was the condensate polishing vessel vented to prevent the accumulation of pressure in the tank?

21

A As I said before, I don't know if there was a vent on the tank.

22

23

24

25

Q So to the best of your knowledge, that transfer of resins could have occurred under pressure; is that correct?

1

2

MR. GLASSMAN: I think the witness has answered twice that he didn't know.

3

4

MR. STEWART: I will withdraw the question.

5

6

Q Did you know at any time whether or not there was a vent on that tank?

7

8

A I am sure at some time in my life I knew there was a vent on that tank, yes, if there was or was not a vent on that tank.

9

10

11

12

13

14

Q I direct your attention back to Exhibit 164 for identification. At the time this field questionnaire came before you, were you aware of pressure differential, if any, between the sluiced water and the station service air?

15

16

A I do not remember what the pressure was of the air system or of the water system.

17

18

Q Do you remember making any inquiry of anyone whether or not there was a pressure differential?

19

A No, I do not.

20

21

22

Q Is it your testimony you don't remember whether or not you made an inquiry of anyone of whether or not there was a pressure differential?

23

A I don't remember making that inquiry.

24

25

Q Do you know, did anyone else make such an inquiry?

2 A I don't know if they did or did not.

3 Q Have you ever heard of a type of valve  
4 known as a check valve?

5 A Yes.

6 Q What is a check valve?

7 A A valve that is designed to allow flow through  
8 it in one direction and prevent flow through it in the  
9 opposite direction.

10 Q Is there a check valve on the agitation  
11 air line, to your knowledge?

12 A I don't remember.

13 Q To your knowledge, were there check valves  
14 in the service air lines?

15 A I don't remember.

16 Q Do you remember whether or not there were  
17 check valves in the instrument air lines?

18 A I assume the last three questions pertain to  
19 check valves between the systems and the condensate  
20 polisher. There were check valves in the air systems  
21 and other places.

22 Q Do you know whether or not check valves  
23 were installed in the agitation air lines at the time  
24 the air lines were installed on the condensate  
25 polishing vessels?

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

A I don't remember.

Q Does this document show that check valves were installed on the agitation air lines?

A The fourth sheet of paper shows a check valve SA-V-402.

Q I direct your attention to the third sheet of paper and ask you whether or not there is any reference to a check valve in that document?

MR. GLASSMAN: The document speaks for itself. It does contain the word check valve.

I think we can all read it.

A Yes.

Q Do you know why a check valve was installed in that piping?

A A check valve would have been installed in this piping to prevent water flow back into the instrument service air system, if the water pressure were to become higher than the air pressure.

Q Did you know or did anyone tell you about the circumstances under which the water pressure could become greater than the air pressure?

A The condensate system pressure was greater than the air system pressure.

Q Under ordinary operation?

2 A Yes.

3 Q And the function of the check valve was  
4 to prevent the backup of water into the air lines;  
5 is that correct?

6 A Yes.

7 Q How many check valves were there for each  
8 agitation air line?

9 A This drawing does not identify a check valve  
10 for each line.

11 Q Where does this drawing show that the  
12 check valve was installed?

13 A It shows the check valve installed between  
14 SA-V-401 and the lines that go to each individual  
15 vessel.

16 Q What was the function of SA-V-401?

17 A SA-V-401 would be used to isolate the section of  
18 air system that went from the distribution header to  
19 the condensate demineralizers.

20 Q Was SA-V-402 the check valve you referred  
21 to?

22 A Yes.

23 Q Do you know who the manufacturer of this  
24 check valve was?

25 A No, I do not.

2 Q Was it a commercial grade check valve?

3 A I don't know tanything about that check valve  
4 other than it is No. SA-V-402.

5 Q What does its numerical designation mean  
6 to you, if anything?

7 A If I wanted to find that valve in the plant, I  
8 would go out and I would look for a valve with a tag  
9 on it that said SA-V-402.

10 Q What does S.A. stand for, if anything?

11 A Service air.

12 Q And V. stands for valve?

13 A Yes.

14 Q Does the numerical designation 402  
15 signify anything other than a numerical designation  
16 for that valve?

17 A That is all.

18 Q At any point up to when this field  
19 questionnaire was prepared, were you aware from any  
20 source of reliability problems having to do with the  
21 operation of check valves?

22 A I had seen check valves in the past that had  
23 leaked through.

24 Q When did you first encounter that?

25 A At Oyster Creek.

2 Q Under what circumstances did you encounter  
3 that situation?

4 A I remember a sump pump that used to try and  
5 pump from the basement up to the ground elevation to  
6 move water out, and I couldn't determine why the pump  
7 kept turning on and off, until I found out that  
8 no sooner would it pump up, it shut off, and the water  
9 was flowing through the check valve and refilling the  
10 sump.

11 Q Is this the first time you had heard of  
12 check valves failing to operate in this manner?

13 A That is the first one that I remember.

14 Q After that time, did you learn about other  
15 failures of check valves to operate properly?

16 A Yes, I had seen check valves that failed to  
17 operate properly.

18 Q And when was the next time you encountered  
19 a situation where a check valve had failed to work  
20 properly?

21 A I don't remember which was the next time.

22 Q What other circumstances did you encounter  
23 where check valves failed to operate properly?

24 A Until today?

25 Q No, up until the time you left Three Mile

2 Island in 1978.

3 A We had a number of check valves that in  
4 preparation for the integrated leak rate test on the  
5 reactor building did not hold 100 percent tight as  
6 was required to prevent leakage out of the reactor  
7 building.

8 Q Do you know when the reactor building  
9 leak rate test was conducted?

10 A On Unit No. 1, it was conducted, I believe, in  
11 1974.

12 Q Was that the time when you encountered  
13 the problems with the check valves during the reactor  
14 building leak rate test?

15 A Prior to that.

16 Q Did you also encounter problems with  
17 check valves at Unit 2 in connection with the reactor  
18 building leak rate test?

19 A I don't remember any specifically.

20 Q Other than the two incidents you have  
21 described at Oyster Creek and Unit 1, were there any  
22 other incidents where you encountered performance  
23 problems with the check valves, up to the end of 1978?

24 A I remember a check valve that failed in the  
25 river water pump house.

2 Q Unit 1 or Unit 2?

3 A Unit 2.

4 Q When did that occur?

5 A I don't remember specifically what year.

6 Q Do you recall the circumstances under which  
7 the valve failed?

8 A The hinge pin on the valve broke.

9 Q Was this in the course of a test of some  
10 sort?

11 A I don't remember how we determined that.

12 Q What was the effect of the check valve  
13 failing in the river water pump?

14 A The water from the pump that was pumping into  
15 the same line would be pumped down through that check  
16 valve in the reverse direction through that pump  
17 as opposed to in through the system.

18 Q Did you encounter any other situations  
19 in which check valves failed to perform as they were  
20 supposed to, up to the end of 1978?

21 A None in specific detail.

22 Q Were you aware of other such check valve  
23 failures occurring?

24 A I believe other check valve failures occurred.

25 Q And you were aware of them before the end

2 of 1978; is that correct?

3 A Yes.

4 Q Would it be fair to say that by February  
5 1977, you at least had a general awareness of the  
6 problem of failures of check valve operation?

7 MR. GLASSMAN: Objection. I am not sure  
8 what the problem is.

9 MR. STEWART: I will withdraw the question.

10 Q Would it be fair to say that by February  
11 1977 you had personally experienced situations where  
12 check valves failed to operate as designed?

13 A Yes.

14 Q And would it also be fair to say that in  
15 addition to the specific circumstances where you had  
16 seen check valves not working as designed, you at  
17 least had knowledge that there were other instances  
18 where they had also failed?

19 A Yes.

20 Q To the best of your knowledge, at the time  
21 agitation air air lines were installed on the condensate  
22 polishing vessels, were there any check valves  
23 installed on those lines besides valve SA-V-402?

24 A I don't remember, and all I can tell you is what  
25 this drawing shows, and this drawing does not show

2 additional check valves. It shows a manual valve.

3 Q Under what circumstances would the manual  
4 valve be opened?

5 A The manual valve should have only been opened  
6 when we were using the air.

7 Q Under all other circumstances, the manual  
8 valve would be closed; is that right?

9 A Yes.

10 Q I believe you mentioned this morning a  
11 valve on the condensate polishers called a discharge  
12 valve. Are you familiar with that term?

13 A I think I referred to the valves on the condensate  
14 demineralizer as the outlet valve.

15 Q Were these air-operated valves?

16 A Yes.

17 Q Were they operated by the TMI-2 station  
18 service air, if you know?

19 A I believe the air pressure to the valve controls  
20 was instrument air.

21 Q Generally speaking, what is instrument air  
22 used for at TMI-2?

23 A Valve operation, instrument controls.

24 Q And service air, I believe you testified,  
25 was used for other purposes, including pneumatic

2 tools?

3 A Right.

4 Q Do you know what the response of the  
5 condensate polisher outlet valves was to a loss of  
6 instrument air?

7 A I don't absolutely remember how the valve was  
8 piped up with the instrument air tubing, but I do  
9 remember incidents where the valve was considered to  
10 have failed open on loss of air pressure.

11 Q Would loss of air pressure be treated by  
12 the outlet valve as a loss of signal?

13 A I think I would have considered that to be true.

14 Q Is it your testimony that to the best of  
15 your recollection, outlet valves failed to open on a  
16 loss of signal?

17 A I don't remember exactly how the valve was piped  
18 up, so I don't remember exactly how it would fail on  
19 loss of instrument air pressure.

20 Q To your knowledge, was there a bypass to  
21 the condensate polishing system at TMI-2?

22 A Yes, there was.

23 Q Was this basically a piping arrangement?

24 A Yes.

25 Q What was the function of the bypass?

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

MR. GLASSMAN: Objection. I am not sure the question is clear. You are asking for the intended function, the design function, or actual function?

MR. STEWART: Let me break it down.

Q Do you know what the design function of the bypass was?

A I don't know that it had a design function.

Q What was it used for?

A I don't know that it had an operating use.

Q Do you know of any use that it had?

A It could be opened to bypass flow around the demineralizer.

Q In other words, if the bypass was opened, condensate would go through the bypass and not through the condensate polishing system; is that correct?

A That's correct.

Q Do you know of any circumstances in which the bypass was used?

A I am not sure that I remember that valve being opened and used for a specific reason.

Q Do you remember that the valve was ever opened?

2 A I remember that the valve was opened.

3 Q Do you remember the reason the valve was  
4 opened?

5 A I remember an incident where the operators  
6 tried to open the valve and use it as a bypass around  
7 the demineralizer.

8 Q Was this under operating circumstances?

9 A What do you mean by "operating circumstances"?

10 Q Was the plant running at the time they  
11 tried to do this?

12 A I don't believe the plant was at power.

13 Q Was the feedwater system running at the  
14 time they tried to do this?

15 A Yes.

16 Q When you say you don't believe the plant  
17 was at power, what do you mean?

18 A I don't believe there was fuel in the vessel  
19 at the time.

20 Q Just so the record is clear, was there a  
21 valve that opened and closed the bypass?

22 A The bypass was a piece of pipe that had a motor-  
23 operated gate valve in it.

24 Q When that valve was opened, condensate  
25 went through the bypass and when it was closed,

1  
2 condensate did not go through the bypass?

3 A That's correct.

4 Q Was there a name for that valve?

5 A I would have called it the condensate polisher  
6 bypass valve.

7 Q You mentioned a minute ago that the valve  
8 was motor-operated; is that correct?

9 A That's correct.

10 Q Could the valve be operated from the TMI-2  
11 control room?

12 A I believe it could.

13 Q Where else could the valve be operated  
14 from?

15 A I don't remember if it could be operated from  
16 the condensate polisher pad or not.

17 Q Was it possible to open and close the  
18 condensate polisher bypass valve by hand?

19 A It was a limitorque operated valve.

20 Q Did that mean that the valve could also  
21 be opened by hand?

22 A Normally limitorque operated valves could be  
23 operated by hand.

24 Q Was there a tool that could be used to  
25 open and close the valve by hand?

2 A No, the limitorque operated valve has a handle  
3 on it.

4 Q To your knowledge, was there an interlock  
5 that caused the condensate polisher bypass valve to  
6 open automatically on the occurrence of any events at  
7 TMI-2?

8 A No, there was not.

9 Q Would such an arrangement be called an  
10 automatic bypass?

11 A If there was an automatic signal to open the  
12 valve with the intent of bypassing the condensate  
13 polisher, I assume it would be called an automatic  
14 bypass.

15 Q Do you know whether or not the original  
16 design of the secondary plant at TMI-2 provided for  
17 the condensate polisher bypass valve to be  
18 automatically operated?

19 A What do you mean by the original design?

20 Q As the secondary plant was designed by  
21 Burns & Roe.

22 A Not to my knowledge.

23 Q Are you familiar with the condensate  
24 cleaning system at TMI-1?

25 A The Powdex system?

1

Toole

2 Q Yes.

3 A Yes.

4 (Whereupon, a recess was taken.)

5 BY MR. STEWART:

6 Q Was there a bypass arrangement for  
7 Powdex system at TMI-1?

8 A Yes.

9 Q What was the purpose of that bypass?

10 A To protect the Powdex vessels. The Powdex  
11 element is a fibrous element. If the pressure  
12 too high, the Powdex can actually be packed in  
13 fibrous element and destroy the element.

14 Q Was the bypass at TMI-1 opened and  
15 by a valve?

16 A Yes.

17 Q What was the name of that valve, if  
18 you know?

19 A I am not sure, but it would be a Powdex  
20 valve.

21 Q Was that a motor-operated valve?

22 A I believe it is an air-operated valve.

23 Q Do you know the reason why some valves  
24 are motor-operated and some valves are air-operated?  
25 Do you know of any engineering reason why in o

2 outlet pipe to the Powdex vessels?

3 A No, they would not.

4 Q How would the suspended solids cause  
5 pressure to rise in the Powdex vessels?

6 A The Powdex itself is a coagulant, more or less,  
7 that picks up the solids, and the coagulant sits as  
8 a block around an element, and the coagulant has  
9 the solids stick on it, and as the solids build up,  
10 the Delta P builds up, and this coagulant becomes more  
11 and more compressed. As it becomes more and more  
12 compressed, it is more of a filter and requires a  
13 higher pressure drop for water to get through it.

14 Q To your knowledge, were there valves on  
15 the outlet lines from the Powdex vessels that regulated  
16 flow out of the Powdex vessels at TMI-1?

17 A There are valves on the outlet, and I believe the  
18 valves on the outlet regulate Delta P on the valves.

19 Q What happens to Delta P when the outlet  
20 valves are opened all the way?

21 A When the valve reaches its full open point,  
22 it would be full open at some Delta P by control  
23 scheme. If the valve could not go open any more, the  
24 Delta P would increase across the vessel.

25 Q Would the Delta P be higher when the outlet

2 valve was closed than it would be if the outlet valve  
3 were open?

4 A You are not providing me enough definition,  
5 because you have a number of vessels in service. If  
6 you are talking about one individual vessel at any  
7 one point in time, then maybe I can answer that.

8 Q Let me put it this way. Does the  
9 differential pressure across the Powdex vessel increase  
10 as the outlet valve closes?

11 A I don't know where the signal is sensed.

12 Q At TMI-1, where was the signal sensed for  
13 differential pressure across the Powdex vessels?

14 A I don't know if it is sensed inside or outside  
15 that valve.

16 Q If the sensor was on the outside of that  
17 valve?

18 A Downstream of the valve.

19 Q Downstream of the valve, what would the  
20 differential pressure be in reaction to the valve  
21 going from an open to a closed position?

22 A The Delta P would increase.

23 Q Would the Powdex bypass valve at TMI-1  
24 open if all flow through the Powdex vessels were  
25 stopped?

2 A It depends on where the blockage was.

3 Q If the blockage was at the outlet valves?

4 A Again it depends on if the Delta P sensing was  
5 outside the valve, as you suggested earlier, yes, the  
6 bypass would open.

7 Q Do you remember where the sensor was in  
8 fact located?

9 A No, I do not.

10 Q Do you know of any circumstances at TMI-2  
11 in which the Powdex bypass valve was used other than  
12 to prevent damage to the Powdex in the vessels?

13 A As I remember, that was the only design use.

14 Q Do you know of any use other than the  
15 design use to which the Powdex bypass valve was put  
16 at TMI-1?

17 A I remember the bypass valve being opened when  
18 the Powdex system was in operation.

19 Q Why was that done?

20 A I don't know why, but I remember on occasion  
21 the operators would open that valve, and that was  
22 something we were absolutely against because as I  
23 defined, with that valve opened, we would feed  
24 contaminants into the downstream side which eventually  
25 would find their way into the steam generator.

2 Q Did the operators leave the Powdex bypass  
3 valve opened during ordinary operation of the TMI-1  
4 plant?

5 A Very seldom. It was an item that we constantly  
6 paid attention to to insure it was closed.

7 Q But the instances you remember where the  
8 bypass valve was opened were instances that occurred  
9 while the plant was in ordinary operation; is that  
10 correct?

11 A No. The system was in operation. I don't  
12 remember whether the plant had fuel in it or whether  
13 it did not have fuel in it.

14 Q To your knowledge, at TMI-2, was there an  
15 alarm in the control room indicating to plant  
16 operators that flow through the condensate polishing  
17 system had stopped?

18 A Not that I remember.

19 Q Do you know what indications, if any, in  
20 the control room told the operators that flow through  
21 the condensate polishers had stopped?

22 A At what condition of the plant?

23 Q During ordinary operating conditions.

24 A With the plant operating at power?

25 Q Yes.

2 A With the plant operating at power, if flow  
3 stopped through the condensate polishers, the feedwater  
4 pumps would trip.

5 Q And that would be the only indication that  
6 you know of to the control room operators that flow  
7 through the condensate polishing system had stopped;  
8 is that correct?

9 A I believe that we could monitor condensate flow  
10 in the control room.

11 Q Do you know how it was monitored?

12 A I don't remember.

13 Q Do you know whether or not there was an  
14 indicator of the actual flow through the system in the  
15 control room?

16 A As I remember, there was a measurement of  
17 condensate flow in the control room.

18 Q And that measurement could indicate to the  
19 operators that flow had come to a halt, I assume?

20 A I believe that is true.

21 Q Were you aware of any procedures that  
22 related to the situation where a flow through the  
23 condensate polishing system came to a stop?

24 A I don't know what the procedure said in that  
25 area.

2 Q Do you know whether or not there was a  
3 procedure?

4 A I know that there would have been an emergency  
5 procedure on loss of feedwater.

6 Q Other than that, do you know of any  
7 procedure?

8 A At this time, I don't remember what procedure  
9 it would be.

10 Q Do you know from any source what the  
11 operators were instructed to do when flow through the  
12 condensate polishing system stopped?

13 MR. GLASSMAN: You are asking for his  
14 knowledge?

15 MR. STEWART: Yes, as of the end of 1978.

16 A I don't remember a source that would have defined  
17 what to do.

18 Q Did you have any awareness of what the  
19 proper operator response was for the stoppage of flow  
20 through the condensate polishing system?

21 MR. GLASSMAN: Objection. I am not sure  
22 what you mean by "proper operator response."

23 MR. STEWART: I will withdraw the question.

24 Q You are a licensed reactor operator, or  
25 were, at least for the Oyster Creek plant, were you not?

2 A Yes, I was.

3 Q And the Oyster Creek plant had a condensate  
4 polishing system, did it not?

5 A Yes.

6 Q What were you instructed to do at Oyster  
7 Creek when flow through the condensate polishing system  
8 stopped?

9 A I don't remember.

10 Q Was there something that you were  
11 instructed to do?

12 A I can't remember that.

13 Q Is it your testimony that you have no  
14 recollection that there was any action that the  
15 operators were taught to do at Oyster Creek when flow  
16 through the condensate polishing system stopped?

17 A I don't remember what the instructions were.  
18 That's correct.

19 Q Do you remember that there were any  
20 instructions of any sort?

21 A I don't remember whether there were or were not  
22 any instructions.

23 Q Do you know whether there were any  
24 instructions at TMI-2 to the plant operators concerning  
25 what they should do when flow through the condensate

2 polishing system stopped?

3 MR. GLASSMAN: What time period?

4 MR. STEWART: Through the end of 1978.

5 A I don't remember what instructions were provided  
6 for the operators.

7 Q Do you remember whether or not there were  
8 instructions to the operators?

9 MR. GLASSMAN: I think this is the line  
10 of questioning that was pursued earlier and  
11 was answered.

12 MR. STEWART: I think it is a different  
13 question.

14 A The operators had procedures. I don't know what  
15 the procedures said about the condensate demineralizers.

16 Q Do you know whether the operators were  
17 taught anything in their training concerning what  
18 response they should take for the failure of flow  
19 through the condensate polisher system?

20 A I had not participated in the operator training  
21 course, so I didn't know what they were trained to do.

22 Q Was it your understanding that the bypass  
23 valve of the TMI-2 condensate polishing system should  
24 be opened on a failure of flow through the condensate  
25 polishing system?

2 A I don't remember that to be something that I  
3 was trained to do.

4 Q What was it you were trained to do upon  
5 loss of flow through the condensate polishing system?

6 MR. GLASSMAN: Objection. I am not sure  
7 Mr. Toole has testified that he was trained to  
8 do anything at all.

9 MR. STEWART: That was the implication of  
10 his last answer.

11 MR. GLASSMAN: I don't know what the  
12 implication of it was.

13 MR. STEWART: Let's see if he can answer.

14 A I don't remember being trained on what to do on  
15 loss of flow through the condensate polisher. We  
16 were trained as to what to do on loss of feedwater.

17 Q And it is your testimony, at least at  
18 TMI-2, a loss of condensate flow ordinarily resulted  
19 in a loss of feedwater; is that correct?

20 A That's correct.

21 Q What were you taught to do in response to  
22 a loss of feedwater?

23 A The plant design was such that the plant could  
24 respond to a loss of feedwater transient. What would  
25 happen is the emergency feedwater system would come on,

2 and the turbine would trip. The reactor would run  
3 back, and the emergency feedwater would supply the  
4 necessary cooling.

5 Q This was at TMI-2; is that correct?

6 A As I remember, both at TMI-1 and TMI-2.

7 Q To your knowledge, was there a time delay  
8 between the failure of main feedwater and the  
9 initiation of emergency feedwater at TMI-2?

10 A When the main feedwater pumps tripped, it gave a  
11 signal to the emergency feedwater pumps to start.  
12 They started. So there was a time delay inherent in  
13 the way the chain worked. I don't remember a timer,  
14 as such, which would have caused the delay.

15 Q Do you know what the time delay was  
16 between the failure of main feedwater and the  
17 initiation of emergency feedwater?

18 A No.

19 Q Do you know whether it was a matter of  
20 seconds or minutes or hours?

21 A I believe it would have been a matter of seconds.

22 Q Do you have any recollection of how many  
23 seconds?

24 A No.

25 Q More than ten seconds?

2 A I don't believe it would be more than ten  
3 seconds, no.

4 Q Once the initiation signal was given to  
5 the emergency feedwater, was there some period of  
6 time that the emergency feedwater system took to  
7 begin supplying emergency feedwater to the steam  
8 generators?

9 A When the pumps started, it would come up to  
10 speed and produce rated pressure very rapidly.  
11 Depending on the condition of the steam generator and  
12 the level, the flow could be varied, in that, on loss  
13 of feedwater, the control point for the level was low,  
14 and we would want the emergency feedwater not to  
15 overfeed, so if the level was high at the point it  
16 came on, the control valve would be trying to control  
17 at a lower level than the level that was existing, and  
18 it would be closed until the controller told it to  
19 open.

20 Q Do you know whether or not the emergency  
21 feedwater system capacity at TMI-2 was greater than or  
22 less than the capacity of the main feedwater system?

23 A It was less than the main feedwater system.

24 Q Do you know how much less?

25 A The design number, I believe, for emergency

2 feedwater was 900 gallons per minute.

3 Q Do you know what the design number was  
4 for main feedwater in terms of gallons per minute?

5 A No. It was in the ball park of 11 million  
6 pounds an hour.

7 Q So if that was divided by 60, we would have  
8 a gallons per minute figure; is that right?

9 A No.

10 Q How would I arrive at a gallons per minute  
11 figure for main feedwater?

12 MR. GLASSMAN: I object to having to spend  
13 time on this with the witness. At one time we  
14 were talking of pounds and at another point  
15 with gallons.

16 A It is somewhere in the neighborhood, the magnitude  
17 of 20,000 gallons a minute.

18 Q Would a loss of feedwater event at TMI-2  
19 always result in a turbine trip?

20 A A loss of the feedwater pumps was an interlock  
21 to trip the turbine.

22 Q Was a loss of feedwater event considered  
23 a major plant transient?

24 A It was a transient that the plant was designed  
25 to withstand.

2 Q Was it a reportable event to the NRC,  
3 to your understanding?

4 A Usually if the turbine tripped or the reactor  
5 tripped, we would report that to the NRC.

6 Q To your knowledge, was it likely that a  
7 turbine trip would result in a reactor trip at TMI-2?

8 MR. GLASSMAN: Objection. I don't know  
9 what you mean by the word "likely."

10 MR. STEWART: Withdraw the question.

11 A How many times in your experience did the  
12 primary plant at TMI-2 successfully run back upon a  
13 loss of feedwater or upon any other secondary plant  
14 transient?

15 A On a trip from above 40 percent power, I don't  
16 remember that the reactor did ever run back.

17 Q Would it be fair to say that when the  
18 reactor was above 40 percent power, then in your  
19 experience, a loss of feedwater event always resulted  
20 in a reactor trip?

21 A I can't say a number such as 45 or 50 or 55.  
22 I think what I remember is one trip that occurred  
23 from 98 percent power, and when that trip occurred,  
24 as I remember, the reactor tripped. When I say that,  
25 I mean one case where the turbine tripped.

2 Q To your knowledge, have there ever been  
3 loss of feedwater events at TMI-1?

4 A I don't remember a loss of feedwater event at  
5 TMI-1.

6 Q To your knowledge, has there ever been a  
7 failure of the Powdex system at TMI-1?

8 A What do you mean by a failure?

9 Q The stopping of flow through the Powdex  
10 system during plant operation.

11 A When the plant was operating at power?

12 Q Yes.

13 A Not that I remember.

14 Q Have you ever heard of there being a  
15 failure at TMI-1 of the Powdex system resulting in a  
16 loss of flow through the Powdex system?

17 A When the plant was operating at power?

18 Q Yes.

19 A Not that I remember.

20 Q Do you recall hearing of this occurring  
21 when the plant was not operating at power?

22 A In the early stages of the test program in Unit  
23 1, I think I remember that we had problems in the  
24 Powdex system which caused us to lose flow.

25 Q Through the Powdex system?

2 A Yes.

3 Q What happened upon the loss of flow through  
4 the Powdex system?

5 A I don't remember.

6 Q To your knowledge, did the Powdex bypass  
7 valve open?

8 A I remember the Powdex bypass valve opening, but  
9 I don't remember why.

10 Q When the Powdex bypass valve opened, did  
11 condensate continue to be supplied to the secondary  
12 plant at TMI-1?

13 A In the condition we were in, it would have been  
14 supplied through a recirculation flow path back to the  
15 condenser.

16 Q Where would the condensate have gone  
17 from the condensers?

18 A It would have been a closed loop running from  
19 the condenser through the condensate lines and back  
20 to the condenser.

21 Q At the time of the event you are describing,  
22 were the feedwater pumps at TMI-1 in operation?

23 A I don't remember. It probably would not have  
24 been.

25 Q In operation?

2 A That's correct.

3 Q Did you ever become aware in October 1977  
4 of a loss of feedwater event at TMI-2?

5 A October 1977 is just a date to me.

6 Q So your testimony is you don't presently  
7 recall having learned in that month of a loss of  
8 feedwater event at TMI-2?

9 A I don't tie that date in my mind to any specific  
10 loss of feedwater event.

11 Q In October 1977, was the secondary plant  
12 at TMI-2 still undergoing startup testing?

13 A Yes.

14 Q What tests were being performed on the  
15 secondary plant?

16 A In October 1977?

17 Q Yes.

18 A I am not sure.

19 MR. STEWART: Let's mark as the next  
20 exhibit in order a document entitled "GPU  
21 Startup Problem Report.

22 (Document entitled "GPU Startup Problem  
23 Report," with attachment, was marked Defendants'  
24 Exhibit 165 for identification, as of this date.)

25 Q You have before you a document that has been

2 marked as Defendants' Exhibit 165 for identification.  
3 I ask you to take a look at this document and at its  
4 attachment, so I can ask you some questions concerning  
5 the matters described in the document.

6 Have you had an opportunity to review  
7 Defendants' Exhibit 165?

8 A Yes.

9 Q What is Defendants' Exhibit 165?

10 A It is a GPU startup problem report, and I  
11 can't determine the number.

12 Q And attached to it, what is that document?

13 A It is a letter dated October 19, 1977 that went  
14 to G. P. Miller and J. L. Seelinger from J. A. Brummer  
15 and M. J. Ross.

16 Q Have you seen this document and its  
17 attachment before?

18 MR. GLASSMAN: The witness was asked the  
19 date of the attached document, and there are two  
20 dates which appear on the top, and I believe  
21 there may be some confusion. The date is clear  
22 on the face of the document.

23 MR. STEWART: There is a date of November  
24 14, 1977 that appears on the document.

25 Q Do you see that?

2 A The date of the letter is November 14, 1977.

3 Q I believe the question before you is  
4 whether or not you have seen this document before.

5 A Yes, I have.

6 Q When did you see this document for the  
7 first time?

8 A I assume 11/17/77.

9 Q Is that a startup problem report of the  
10 variety you testified about yesterday?

11 A Yes.

12 Q And it was prepared in the regular course  
13 of business by employees of GPU and Met Ed; is that  
14 correct?

15 A That's correct.

16 Q And it was the regular course of business  
17 of employees of GPU and Met Ed to prepare startup  
18 problem reports; is that correct?

19 A That's correct.

20 Q Was it also in the regular course of  
21 business for employees of Metropolitan Edison Company  
22 to prepare memoranda concerning plant operating events?

23 A Yes.

24 Q To your knowledge, is the attachment to  
25 Defendants' Exhibit 165 a document that was prepared

2 in the regular course of business, if you know?

3 A Yes.

4 Q You had testified, I believe, that the  
5 letter attached to Defendants' Exhibit 165 was  
6 prepared by John Brummer and Mr. Ross. Who is Mr.  
7 Brummer?

8 A He was a Met Ed site instrument control engineer.

9 Q Did you know him personally?

10 A Yes.

11 Q How long had you known Mr. Brummer at  
12 the time you received this site problem report?

13 A I don't remember.

14 Q Had it been more than one year?

15 A I am not sure of that.

16 Q Did you have an opinion on the competence  
17 and experience of Mr. Brummer?

18 MR. GLASSMAN: Objection. This witness  
19 has not testified as to his relationship with  
20 Mr. Brummer, and I don't know that he is  
21 competent to answer that question.

22 MR. STEWART: You instruct him not to  
23 answer the question?

24 MR. GLASSMAN: Yes.

25 Q Mr. Ross works for you today, does he not?

2 A Yes, he does.

3 Q Did you in November 1977 have an opinion  
4 on the competence of Mr. Ross?

5 MR. GLASSMAN: Objection. It has not been  
6 established what relationship Mr. Ross had with  
7 Mr. Toole at the time this document was written.

8 Q Did you know Mr. Ross at the time this  
9 document was written?

10 A Yes.

11 Q What was his position?

12 A As defined here, he was a shift supervisor.

13 Q Did you have an opinion of the competence  
14 and capability of Mr. Ross in November 1977?

15 MR. GLASSMAN: Objection. It still has  
16 not been established what relationship Mr.  
17 Ross had to Mr. Toole at that time.

18 MR. STEWART: Mr. Toole could still have  
19 an opinion. You instruct him not to answer  
20 the question?

21 MR. GLASSMAN: Mr. Toole has not been  
22 established as the supervisor who would evaluate  
23 Mr. Ross's performance, and in the absence of  
24 that, I instruct him not to answer.

25 Q Did Mr. Ross report to you at that time?

2 A No, he did not.

3 Q Did Mr. Brummer report to you at that time?

4 A No, he did not.

5 Q Did you ever work with Mr. Ross or Mr.

6 Brummer on or before November 1977?

7 A Yes.

8 Q Under what circumstances?

9 A They had both been on the Island for some time.

10 Q Had you worked jointly with them on any  
11 matter?

12 A I had contact with both individuals during the  
13 Unit 1 startup. I had worked on shift with Mike Ross.

14 Q What was your opinion of Mr. Ross's  
15 experience and capability in November 1977?

16 MR. GLASSMAN: I object and direct the  
17 witness not to answer.

18 MR. STEWART: On what grounds?

19 MR. GLASSMAN: Same as before. If you  
20 would like to ask the witness about a particular  
21 incident or particular action, please go ahead.

22 MR. STEWART: What privilege are you  
23 asserting?

24 MR. GLASSMAN: I think the objection stands.  
25 The witness is not competent to make an

2 evaluation of the competence or lack of  
3 competence of a particular individual. If you  
4 would like to go into the facts as they occurred,  
5 you are free to do so.

6 MR. STEWART: Your desire for obstruction  
7 is not a ground for an objection.

8 MR. GLASSMAN: I don't think that it is  
9 an obstruction.

10 MR. STEWART: The record will show what  
11 it is.

12 Q Does Defendants' Exhibit 165 and the  
13 attachment accurately describe the events at TMI-2 in  
14 November 1977?

15 A As I remember it, this is fairly accurate.

16 Q Do you know of any particular that is  
17 inaccurate on this document?

18 A I don't remember anything that would indicate  
19 that there was something in here that is inaccurate.

20 Q The startup problem report, which is the  
21 first page in Defendants' Exhibit 165, was a document  
22 that was submitted to you, was it not?

23 A That's correct.

24 Q And at the time it was submitted to you,  
25 the letter to Mr. Miller and Mr. Seelinger from Mr.

1

2 Ross and Mr. Brummer was an attachment to the startup  
3 report?

4

4 A I believe it was.

5

6

5 Q And you read both documents at the time  
6 you received the startup problem report?

7

7 A I believe I did.

8

9

8 Q Directing your attention to the first page  
9 of this document, did you specifically read what Mr.  
10 Brummer had written following the words "Problem  
11 Description"?

12

12 A Did you say did I at that time, or would I?

13

14

13 Q Did you at that time?

15

14 A Yes, I did.

16

15 Q Did you also read the summary of events  
16 set forth in the letter to Mr. Miller and Mr. Seelinger  
17 written by Mr. Brummer and Mr. Ross?

18

18 A I believe I did.

19

20

19 Q Did you investigate the matters which  
20 Mr. Brummer and Mr. Ross had raised in their letter  
21 to Mr. Seelinger and Mr. Miller?

22

22 A I don't know whether I investigated everything  
23 that they said or not.

24

25

24 Q Did you investigate anything that they  
25 said?

2 A I don't remember investigating anything they said.

3 Q Is it your testimony that you did not in  
4 fact investigate anything they reported to you in this  
5 document?

6 A I don't remember investigating anything either  
7 way, whether I did investigate it or not.

8 Q Do you remember assigning anyone else to  
9 perform any investigation of the matters set forth  
10 in Defendants' Exhibit 165 and its attachment?

11 A No, I do not.

12 Q Is Defendants' Exhibit 165 the first time  
13 you had heard of there being water in the instrument  
14 air lines in the secondary plant at TMI-2?

15 A I don't remember either way.

16 Q Do you remember that there did come a time  
17 when you first learned that water had been found in  
18 instrument air lines at TMI-2?

19 A Yes.

20 Q When was that?

21 A I am not sure, but by reading this, this  
22 indicates to me that this was the first occasion that  
23 I had.

24 Q Was this also the first occasion that you  
25 had that there was rust found in the air-operated

2 valves of the condensate polishing system?

3 A When the condensate polishing system was turned  
4 over to Startup and Test from Construction, the  
5 condensate polishing system had been stored outside  
6 the building during the flood of 1972, and the system  
7 was partially damaged during the flood. Construction  
8 I believe had an L.A. Water Treatment representative  
9 come on site, and they did an inspection, and they  
10 did some repair to the polishing unit as a result of  
11 that. When the unit was turned over to us from  
12 Construction, there was still some items that were  
13 rusty and had to be cleaned up.

14 Q Were they cleaned up?

15 A We cleaned up what we had identified, yes.

16 Q What time was that?

17 A That would have been prior to 11/17/77.

18 Q Do you know how long prior to November  
19 1977 that would have been?

20 A Within a year prior to that, I believe.

21 Q At the time the Startup Group cleaned or  
22 reconditioned parts of the condensate polishing system,  
23 were those pieces of equipment stored inside?

24 A When it was turned over to the Startup and Test  
25 Group, it was considered constructed.

2 Q So --

3 A So it was inside.

4 Q You referred a minute ago to a flood.  
5 Was that a flood of the Susquehanna River?

6 A Yes.

7 Q Were the condensate polishers submerged  
8 during that flood?

9 A Part of the condensate polishing system was,  
10 yes.

11 Q Were the outlet valves to the condensate  
12 polishers installed on the polishers at the time of  
13 the flood?

14 A The condensate polishers come in on a skid with  
15 the vessels and the valves and everything on a skid.

16 Q Is it your testimony that the valves were  
17 outdoors at the time of the flood of the Susquehanna  
18 River?

19 A I believe they were.

20 Q After the flood, did anyone other than  
21 L.A. Water Treatment look at the polishers to  
22 determine what damage had been sustained as a result  
23 of the flood?

24 A L.A. Water Treatment would have been brought in  
25 either by our construction people or by Burns & Roe.

2 I don't know who did bring L.A. Water Treatment in.

3 Q Do you know whether Burns & Roe looked at  
4 the condensate polishers to determine what damage  
5 they sustained, if any, during the flood?

6 A I don't know if they did.

7 Q You do know that L.A. Water Treatment came  
8 to the site and performed some repair on the condensate  
9 polishers?

10 A Yes.

11 Q How long was L.A. Water Treatment on the  
12 site?

13 A I don't know.

14 Q Do you know if it was more or less than a  
15 week?

16 A I am not sure.

17 Q How many people from L.A. Water Treatment  
18 came to the site to perform this repair?

19 A I don't know.

20 Q After the repair was finished by L.A.  
21 Water Treatment, were the condensate polishers  
22 inspected to determine whether or not the repair  
23 had been done properly?

24 A I don't know.

25 Q In the ordinary course of business, who

2 would it have been who would have had the  
3 responsibility to inspect the work of a vendor like  
4 L.A. Water Treatment to determine whether or not the  
5 work had been done properly?

6 A In a case like this, it would have been normal  
7 for a United Engineer supervisor to do that type of  
8 thing.

9 Q Was there a particular individual at United  
10 Engineering who had responsibility for the condensate  
11 polishing system at TMI-2?

12 A I don't remember if there was or there was not.

13 Q Was there a particular person who had  
14 responsibility for the secondary plant at TMI-2 from  
15 United Engineers?

16 A Not that I remember.

17 Q Did there come a time when the condensate  
18 polishing system was turned over to GPU Startup for  
19 testing and other work?

20 A The condensate polisher was turned over to  
21 Startup for testing on a certain date.

22 Q By whom?

23 A It was turned over from United Engineering  
24 Construction to a part of the Test Group.

25 Q Do you know what date it was turned over?

2 A No.

3 Q At the time the system was turned over  
4 to the Startup Group, did the Startup Group perform  
5 the inspection of the system to insure that it had  
6 been constructed properly?

7 A Yes.

8 Q What was the nature of the inspection?

9 A We would have made a visual inspection.

10 Q Would you have disassembled any components  
11 of the system to determine that they were assembled  
12 correctly?

13 A If we visually saw a problem, we would have taken  
14 it apart and corrected it.

15 Q What other types of inspection other than  
16 visual inspection did GPUSC make of the condensate  
17 polishers?

18 A We did a flush on the system, a hydro on the  
19 system, electrical checks, instrumentation checks.

20 Q How long did it take to perform the flush  
21 on the system?

22 A I don't remember.

23 Q What did it ordinarily involve to perform  
24 a flush on the condensate polishing system?

25 A In the secondary side, we do a chemical cleaning

2 in the secondary side of all the piping, and a flush  
3 to follow, and I think when we chemically clean, we  
4 chemically clean right through these vessels, and that  
5 evolution would have probably taken two to three  
6 months in preparation up through test performance  
7 completion.

8 Q What chemical was used to chemically  
9 clean the condensate polishing system?

10 A I don't know what it was. It was a citric  
11 acid. I am not sure what the caustic was.

12 Q Do you recall whether or not this flush  
13 occurred before or after January 1977?

14 A Before.

15 Q What is your best recollection of the time  
16 this flush was performed?

17 A I don't have a good recollection of when that  
18 occurred.

19 Q What is your best recollection?

20 A I don't have any feel for when that occurred.

21 Q What was involved in performing the  
22 hydro test on the condensate polishing system at TMI-2?

23 A The system would be filled with water, and the  
24 hydro pump would be installed and turned on and pumped  
25 up to pressure. We would go to whatever the test

2 pressure was, and we would inspect the system for  
3 leaks.

4 Q Was the system found to leak?

5 MR. GLASSMAN: What time period?

6 MR. STEWART: The time of the hydro test.

7 A I don't remember.

8 Q At any time during this initial testing  
9 that was performed by the Startup Group at GPU,  
10 were the air-operated discharge valves in the  
11 condensate polishers disassembled and cleaned?

12 A I don't believe they were.

13 Q Were the inlet valves to the condensate  
14 polishers disassembled and cleaned?

15 A Not that I recall.

16 Q Were the air lines to those valves cleaned?

17 A I don't remember,

18 Q That they were?

19 A That they were or were not.

20 Q Were there any other valves to the  
21 condensate polisher vessels other than the inlet  
22 valves and outlet valves?

23 A There are numerous valves in the condensate  
24 system on either side of the condensate polishers.

25 Q To your knowledge, were any valves

1

2 disassembled and cleaned in that system?

3

A Not that I remember specifically.

4

Q How many valves altogether were in that  
5 system?

6

A The only indication that I can give you is this  
7 Met Ed letter. It says there were 42 diaphragm  
8 operated valves in the condensate polishing and  
9 condensate polishing regeneration skid.

10

Q Were any of those 42 valves, to your  
11 knowledge, disassembled and cleaned at the time GPU  
12 Startup received this condensate polishing system from  
13 United Engineers?

14

A I don't know if they were or if they were not.

15

Q Was there anyone in the Startup Group who  
16 had direct responsibility for installation and testing  
17 of the condensate polishing system?

18

A For the testing that was described earlier,  
19 the responsibility would have been within the realm  
20 of Kakarla.

21

Q Were there records kept of the flush and  
22 hydro tests performed on the condensate polishing  
23 system?

24

A Yes.

25

Q What type of records were kept?

1

2 A As I defined to you earlier, the condensate  
3 system was an MTX system, and we had MTX test files.

4 Q What does MTX mean?

5 A Master test index.

6 Q You testified that Mr. Kakarla would have  
7 been the person in your organization responsible for  
8 conducting the testing on the condensate polishing  
9 system; is that right?

10 A Yes.

11 Q If Mr. Kakarla had disassembled and  
12 reconditioned any of the diaphragm operated valves in  
13 that system, would he have been required by your  
14 practice to prepare a report of the test he conducted?

15 A No, he would not.

16 Q Would he be required to follow a particular  
17 test procedure?

18 A Yes.

19 Q What test procedure would that have been?

20 A I think it was TP 250/1.

21 Q Did TP 250/1 have sheets for recording  
22 data, for making entries, showing the various steps  
23 of the procedure that had been followed?

24 A Yes.

25 Q Would those executed sheets be kept in the

2 TMX files?

3 A Yes.

4 Q Where are the MTX files now kept?

5 A I don't know.

6 Q Do you know of any requirement of law or  
7 of Met Ed or GPU procedures requiring that such files  
8 in fact be kept?

9 A I believe that these files were submitted to our  
10 document control people and were put on microfilm.

11 Q Do you know where they are now?

12 A I don't know where the microfilm is.

13 Q In addition to the flush and hydro  
14 testing, there was also electrical checkout and an  
15 instrumentation testing; is that right?

16 A That's correct.

17 Q What was the nature of the instrumentation  
18 testing?

19 A It would be, as I defined yesterday, loop check.

20 Q What loop are you referring to when you say  
21 loop check?

22 A An instrument loop.

23 Q That would be an electrical loop,  
24 electrical wiring?

25 A Yes.

2

Q Could it also be air lines in a case  
3 where there was an air operated valve?

4

A Air operated valves could be involved, yes.

5

Q Do you know of any circumstances where an  
6 instrument check was conducted on the air lines of an  
7 air operated valve?

8

A On the air operated valves on the condensate  
9 polisher units, I believe that we would have operated  
10 the valves and documented it.

11

Q How would you have operated the valves  
12 in the ordinary course of performing this testing?

13

A The valves would have a control scheme, and we  
14 would go through and insure that all items that fed  
15 into the control scheme would in fact do their  
16 function and the control scheme would in fact open  
17 and close the valve.

18

Q Did the valves in the condensate polishing  
19 system successfully pass the instrumentation test?

20

A I believe they did.

21

Q Defendants' Exhibit 165, does your  
22 handwriting appear anywhere on that document?

23

A Yes.

24

Q Where does it first appear?

25

A On the line "For Resolution By."

1

2 Q Is that your name?

3 A Yes.

4 Q Is that your handwriting?

5 A I believe it is, yes.

6 Q After the words "Proposed Resolution,"  
7 is that also your handwriting?

8 A I believe it is, yes.

9 Q In this part of the document, the words  
10 appear: "The water damage you observed could have been  
11 a result of this damage."

12 Were you referring to damage caused by  
13 floodwaters?

14 A The first sentence says: "The condensate Demin  
15 system was underwater during the flood." The second  
16 sentence says: "The water damage you observed could  
17 have been a result of this damage."

18 Q Was it your opinion that the flood was  
19 also the source of the water that Mr. Brummer found  
20 in the air lines in November 1977?

21 A I believe it was, yes.

22 Q That was your intent in writing these  
23 words; is that what you are saying?

24 A The memo addressed damage to the valves caused  
25 by water, and it's identified by rust color and that

2 the duration of time that the water was there was  
3 represented by the rust color.

4 Q In the letter written to Mr. Miller and  
5 Mr. Seelinger by Mr. Ross and Mr. Brummer, do they  
6 refer to the fact that they found water in the  
7 instrument air system at or about the time of the  
8 transient on October 19, 1977?

9 MR. GLASSMAN: We all can read the  
10 document, obviously. If you have a particular  
11 paragraph in mind, perhaps you can point it out  
12 to the witness.

13 A The document indicates that an instrument  
14 problem caused the valves to close. It also indicates  
15 that an auxilliary operator noticed water coming out  
16 of a diaphragm valve.

17 Q In addition, was water found in the  
18 instrument air system at about the time of the  
19 transient on October 19, 1977?

20 MR. GLASSMAN: If you know,

21 A I don't remember water being found throughout  
22 the system, no.

23 Q Do you remember any water being found in  
24 the system?

25 A No, I do not remember that.

2 Q Did this memorandum inform you at or about  
3 the time you received it that Mr. Brummer and Mr.  
4 Ross had found water in any part of the instrument  
5 air system?

6 A This memo identifies water in the air systems  
7 of the condensate polishing system, but does not  
8 explain how it got there.

9 Q I direct your attention to the site  
10 problem report which is the first page of this  
11 document. Was it your belief at the time you filled in  
12 the part of the document that you wrote that the water  
13 Mr. Brummer and Mr. Ross had found had been water  
14 left by floodwaters?

15 A I believe that is what I understood.

16 Q When did the flood occur?

17 A In 1972.

18 Q When was this memo dated?

19 A 1977.

20 Q Was it your belief that the water in the  
21 condensate polishing system was five years old?

22 A I believe that is possible.

23 Q Did you look at the water to determine  
24 its composition?

25 A I don't remember looking at the water.

2 Q Did you have anyone take a look at the  
3 water that was found in the condensate polisher valves?

4 A I don't remember if I did or did not.

5 Q Do you know whether mud was found in the  
6 water?

7 A I don't remember.

8 Q One way or the other?

9 A No.

10 Q Did you have any of the water looked at  
11 under a magnifying glass to determine whether or not  
12 there were any particles suspended in the water?

13 A I don't remember.

14 Q On page 2 of their letter to Mr. Seelinger  
15 and Mr. Miller, the first full paragraph, Mr. Brummer  
16 and Mr. Ross refer to one remote fluid path that could  
17 have caused the water to be found in the condensate  
18 polisher outlet valves. That remote fluid path they  
19 describe would be one caused by demineralized water  
20 under an abnormally high pressure being forced  
21 through the service air system through three check  
22 valves, through the instrument air dryer into the  
23 condensate polishing controls.

24 By late 1977, you had already had experience  
25 with reliability problems involving check valves,

2 had you not?

3 MR. GLASSMAN: I am not sure what the  
4 nature of this question is. There is a  
5 statement, I believe, regarding what you, Mr.  
6 Stewart, think Mr. Brummer and Mr. Ross said in  
7 this memo, and then there was subsequent, what  
8 appeared to be, a question relating to Mr.  
9 Toole's prior knowledge. They don't seem to be  
10 related. I don't want to have the witness  
11 confused.

12 MR. STEWART: I will restate the question.

13 Q In late 1977, had you had experiences with  
14 failures of check valves?

15 A I had seen one check valve fail but never more  
16 than one valve in a series fail.

17 Q And you were also aware, were you not,  
18 in late 1977 that the pressure within the condensate  
19 polisher vessels exceeded the pressure in the  
20 instrument air lines, were you not?

21 A I knew when condensate was running through the  
22 polishers that the pressure of the condensate system  
23 was higher than the air system.

24 Q Did you perform any investigation of the  
25 possibility of water being forced into the instrument

1  
2 air system from the condensate polishers?

3 MR. GLASSMAN: What time frame?

4 Q At or after the time you received the  
5 site problem report from Mr. Brummer.

6 MR. GLASSMAN: I think that has been  
7 asked and answered. I believe you asked Mr.  
8 Toole whether there was an investigation which  
9 he performed or requested in relation to this  
10 particular event, and he answered the question.

11 MR. STEWART: You instruct him not to  
12 answer this question?

13 MR. GLASSMAN: I am very much tempted to,  
14 because we have gone over the same information,  
15 but to expedite it, I will let him answer the  
16 question.

17 Q You may answer the question.

18 A No, I do not.

19 Q Let me direct your attention to Defendants'  
20 Exhibit 152 for identification. You have that  
21 exhibit before you?

22 A Yes.

23 Q I direct your attention to the second page  
24 of that document. When did the condensate polishing  
25 system functional test receive DOT approval?

2

3

4

5

6

7

8

9

10

11

MR. GLASSMAN: I object. We have been through the dates on this document before, and indeed Mr. Toole testified he never saw this document prior to your showing it to him. That is the way I recollect his testimony. I don't think there is any sense in going over this document again any more. We have done it a long time ago ad infinitum, and it really shouldn't have been gone over in the first place.

12

I direct him not to answer.

13

14

15

16

Q Did the DOT approve the test results of the condensate polishing system at about the same time you received the GPU startup report relating to that system?

17

A The test results were approved on 11/17/77.

18

19

20

Q And when did you receive the GPU startup problem report which is numbered Defendants' Exhibit 165 for identification?

21

A 11/17/77.

22

Q In other words, the same day?

23

A Yes.

24

25

Q Did any matters set forth in Defendants' Exhibit 165 for identification indicate to you that

2 there was possibly some deficiency with the condensate  
3 polishing system?

4 A 165 indicated that there was a deficiency that  
5 had been corrected.

6 Q What was the deficiency that you believed  
7 to have been corrected?

8 A The dirty and clogged up lines to the 42 valves.

9 Q How did you believe this situation had  
10 been corrected?

11 A The letter says that it was,

12 Q Did you believe that this was a situation  
13 that could not occur again?

14 A Yes.

15 Q What was your reason for concluding that  
16 the event could not occur again?

17 A As this letter defined, the Instrument Department  
18 felt it was an instrumentation problem, and when they  
19 began their investigation, they did find 42 valves that  
20 had lines that were dirty and had corrosion in it,  
21 and there was water found inside those valves.

22 Q What did you conclude --

23 A And I concluded at that time that was probably  
24 the reason the valves failed at that time.

25 Q Was your conclusion that water had caused

2 the valves to fail?

3 A Either corrosion or water or a combination of  
4 both.

5 Q A moment ago you mentioned that the  
6 memorandum from Mr. Ross and Mr. Brummer refers to the  
7 finding of dirty water in the valves. Can you  
8 direct me to the place in the memorandum that mentions  
9 dirty water?

10 A It says three-quarters of the valves had rusty  
11 water and rust rings on the diaphragms indicating that  
12 the water had been there for some time.

13 Q You make a distinction between dirty and  
14 rusty water?

15 A No.

16 Q What did you think had been the source of  
17 the water that Mr. Brummer and Mr. Ross had found in  
18 the system?

19 MR. GLASSMAN: Objection. Asked and  
20 answered. I direct him not to answer. We have  
21 been through this before just a few moments ago.

22 Q Can you think of any other manner in which  
23 water could have gotten into the instrument air system  
24 besides the flood of 1972?

25 MR. GLASSMAN: Objection. We have had the

2 witness's testimony as to what he knows about  
3 this event. We are not asking him to speculate  
4 about what else, what might, could have.

5 MR. STEWART: You instruct him not to  
6 answer the question?

7 MR. GLASSMAN: Yes.

8 Q When you received this startup report,  
9 what did you understand your obligations to be with  
10 respect to it?

11 A My obligation was to review the problem report,  
12 determine whether we would need additional input from  
13 someone else or whether the problem report needed to  
14 be pursued by someone else.

15 Q Did you conclude that any input was needed  
16 from somebody else to this problem report?

17 A I did not.

18 Q Did you conclude that any action needed  
19 to be taken in response to this problem report?

20 A As I wrote here, I concluded no further action  
21 required by this problem report.

22 Q Was your conclusion based on the fact  
23 that you believed that the water found in the  
24 condensate valves came from a flood that had occurred  
25 five years before?

1  
2 MR. GLASSMAN: I object insofar as the  
3 question seems to indicate that there is only  
4 one basis. I think first, if you would like to  
5 establish whether there was more than one basis --

6 MR. STEWART: I tried to find out, and  
7 you instructed the witness not to answer the  
8 question. Can he answer this question?

9 MR. GLASSMAN: I did not instruct him not  
10 to answer the question that I think you have  
11 in mind, but answer the question.

12 (Record read.)

13 A I believe that the water and the rust could have  
14 been a possibility.

15 Q Could you think of any other possibilities  
16 besides the flood as the source of the water and the  
17 rust?

18 MR. GLASSMAN: Objection. If Mr. Toole  
19 had a particular cause that he understood at the  
20 time, you can ask him about it, but I won't  
21 let him hypothesize.

22 Q What other possibilities did you consider  
23 as possible sources of the water and the rust at the  
24 time you received the startup problem report?

25 A As I remember, when I read this report and the

2 way it was written and the discussions that I had  
3 with the other people involved, I did not feel that  
4 there was any other source of water.

5 Q Than the flood of 1972?

6 A Yes.

7 Q Did you also conclude that the possibility  
8 Mr. Brummer and Mr. Ross mentioned of the remote path  
9 through the instrument air system through the condensate  
10 polishers was not a credible possibility?

11 A The sentence previous to that says that "as a  
12 result of above discussed investigation and the tracing  
13 of all instrument air lines in the vicinity, no fluid  
14 path has been found that would explain this occurrence."  
15 Med Ed, as I remember, had looked all over the system  
16 to see if there was water in other locations or to  
17 try to determine where it came from, and they did not  
18 really know where it came from or have a good feel  
19 where it could have come from, and the only potential,  
20 and they considered that remote, was it leaked  
21 through three check valves in an instrument air dryer  
22 and a number of other components.

23 Q Did you consider that possibility less  
24 probable than the persistence of water for five years  
25 in the outlet valves of the condensate polishing system?

1

2 A Yes.

3

Q Even though the condensate polishing system  
4 had been repaired by L.A. Water Treatment after the  
5 flood?

6

MR. GLASSMAN: Is that a question?

7

MR. STEWART: Yes.

8

MR. GLASSMAN: I object to the form.

9

Q Can you answer the question?

10

A Yes.

11

Q Even though the system had been flushed  
12 and hydroed by the GPU Startup Group?

13

A Yes.

14

Q And even though the instrumentation tests  
15 had been performed on the system by the GPU Startup  
16 Group?

17

A Yes.

18

Q At the time you saw this, did you contact  
19 Mr. Kakarla and ask whether or not he disassembled  
20 and checked the air operated valves in the system  
21 after receiving it from United Engineers?

22

A I don't remember that.

23

Q You don't remember that you did?

24

A I don't remember that I did.

25

Q Do you remember checking the files of the

2 Startup Group to see whether or not there were any  
3 copies of test procedure 250/1 that would have  
4 reflected whether or not Mr. Kakarla or anyone else  
5 in the Startup Group had done such a test or inspection?

6 A I don't remember doing that.

7 Q The startup problem report also mentioned  
8 other matters too. Under "Problem Description" in  
9 this document, the statement appears that Met Ed  
10 feels that Burns & Roe should reevaluate the control  
11 of COV12. What was COV12?

12 A That was the bypass around the condensate  
13 polishers.

14 Q Do you know why Met Ed felt control of  
15 that valve should have been reevaluated?

16 A Mike Ross was a shift supervisor with experience  
17 on Unit No. 1, and he understood how the Powdex system  
18 worked on Unit 1, and he knew in Unit 1 there was a  
19 bypass valve around the Powdex element that would open  
20 on high Delta P.

21 Q Was that the suggestion he was making as  
22 a change to the equipment in TMI-2?

23 A I believe it was.

24 Q Did you believe that this suggestion was  
25 a worthwhile suggestion?

1  
2 A As I defined in earlier testimony, the bypass  
3 valve around the Powdex was in there to protect the  
4 Powdex elements from being damaged. The bypass valve  
5 around the condensate polishing unit in Unit 2 would  
6 not have been needed to protect the condensate  
7 polishers. There had been an event in the SMUD station  
8 where the turbine had come apart, and I remember  
9 reading in the study where Westinghouse accused  
10 SMUD of running with the condensate polisher bypass  
11 open a considerable amount of time, and both B&W and  
12 Westinghouse had a considerable amount to say about  
13 the condensate polisher operation at SMUD, and we had  
14 discussed feedwater quality with Burns & Roe and B&W  
15 and Westinghouse at great length in Unit No. 2, and  
16 we were committed to not bypassing the condensate  
17 polisher demineralizers. We were intent on protecting  
18 the steam generators and the turbine.

19 Q What would have happened at TMI-1 had  
20 all flow through the condensate polishers abruptly  
21 stopped?

22 A Unit 1 didn't have condensate polishers. I  
23 assume you mean the Powdex system.

24 Q I do.

25 A I believe we talked about this before. If it

2 was abruptly stopped, we would have a loss of  
3 feedwater transient which the plant was designed to  
4 handle.

5 Q Would the bypass valve to the Powdex  
6 system at TMI-1 have opened?

7 A The bypass valve on TMI-1 may or may not open.  
8 I don't remember that they ever had an incident where  
9 that valve opened and prevented a loss of feedwater.

10 Q You mentioned a moment ago that at SMUD the  
11 secondary plant had been run with a bypass open to  
12 the condensate polishing system. Do you know for what  
13 period of time the operators at SMUD had operated the  
14 plant in that fashion?

15 A I don't remember the specifics of how often and  
16 how long.

17 Q Do you have any understanding of how often  
18 or how long they operated the plant in that condition?

19 A I remember seeing a report which indicated that  
20 they did it a considerable time frame.

21 Q What do you mean by your use of the word  
22 "considerable"?

23 A There were a number of occasions where it was  
24 found open.

25 Q Was the valve kept open during plant

2 operation for more than a few hours at a time?

3 A I believe that is true, yes.

4 Q I direct your attention to the first page  
5 of the letter written to Mr. Miller and Mr. Seelinger  
6 by Mr. Brummer and Mr. Ross, and to the very last  
7 sentence in the third full paragraph on that page.  
8 The sentence says: If this would have happened while  
9 at power the unit would have been placed in a severe  
10 transient condition resulting in an emergency feedwater  
11 actuation, main steam relief to atmosphere, turbine  
12 trip and reactor runback with possible trip."

13 Would you agree with that statement?

14 MR. GLASSMAN: Objection. Are we talking  
15 of agreeing with every word in the statement?

16 Q What did you understand Mr. Brummer and  
17 Mr. Ross to be saying in that sentence?

18 A Mr. Brummer and Mr. Ross referred to a severe  
19 transient, but this was a transient that the plant  
20 was designed to withstand. This would not have been,  
21 in my opinion, a severe transient.

22 Q So it is your opinion that Mr. Brummer  
23 and Mr. Ross's statement is incorrect?

24 A I believe that the word "severe" is not  
25 appropriately applied,

2 Q How would you characterize the transient  
3 that would ensue from a sudden termination of flow  
4 through the condensate polishing system while the unit  
5 was at power?

6 A If we lost feedwater, the feedwater pumps would  
7 trip, the turbine would trip, and the emergency  
8 feedwater would start, the main steam reliefs would  
9 open, and the reactor would run back, possibly  
10 tripping.

11 Q As of November 1977, how many successful  
12 reactor runbacks have you seen at TMI-1?

13 MR. GLASSMAN: Asked and answered.

14 MR. STEWART: I don't think so with respect  
15 to this time period.

16 MR. GLASSMAN: I think it has.

17 A Reactor runback from where?

18 Q From power.

19 A For what reason?

20 Q For a loss of feedwater in the secondary  
21 side.

22 A I don't remember that I had seen any.

23 Q Had you seen any loss of feedwater  
24 incidents at TMI-1 by this time?

25 A I had seen a loss of feedwater incident at Unit

2 No. -- which unit did you say?

3 Q 1.

4 A I don't remember seeing a loss of feedwater  
5 in Unit No. 1.

6 Q As of November 1977, had you heard of any  
7 Babcock & Wilcox reactors successfully running back  
8 from a loss of feedwater?

9 A Not that I remember.

10 Q Had you heard of any reactor trips upon  
11 a loss of feedwater that have been made by B&W?

12 A There was a loss of feedwater runback in Unit  
13 No. 2.

14 Q When was that?

15 A You are asking as of 1977?

16 Q Yes.

17 A It had not occurred at that time.

18 Q To your knowledge, was it possible to  
19 operate the TMI-2 unit for a limited period of time  
20 without the condensate being demineralized by the  
21 condensate polishing system without damaging the  
22 steam generator or the turbine?

23 MR. GLASSMAN: Objection, I am not sure  
24 what you mean by "damaging."

25 MR. STEWART: In the sense the witness used

2 the word earlier.

3 A As I testified earlier, there were schools of  
4 thought by B&W and by Westinghouse that chemical  
5 attack could occur very, very rapidly.

6 Q To your knowledge, if the condensate were  
7 not demineralized for a period of ten minutes, could  
8 serious chemical attack to the steam generator or the  
9 turbine occur?

10 MR. GLASSMAN: If you know.

11 Also I object to the question. I am not  
12 sure what is meant by the word "serious" in the  
13 question.

14 A It depends on the level of contaminants and  
15 what is in it.

16 Q Assuming that the condensate polishers  
17 have been working properly up to that point.

18 A I can't answer that.

19 Q Why not?

20 A I talked to many, many chemists about chloride  
21 stress corrosion, and some of them provide an  
22 indication that this happens very, very rapidly.

23 Q Within ten minutes?

24 A Sometimes in my discussions with chemists from  
25 both B&W and Westinghouse, they impress me that they

2 had a feeling this could happen instantaneously.

3 Q What was the total inventory in the  
4 secondary system at TMI-2?

5 A Probably about 60,000 gallons.

6 Q How many times a minute was the total  
7 inventory in the secondary system recirculated?

8 A Once every approximately three minutes.

9 Q Is it your testimony that if the inventory  
10 in the secondary system were not demineralized  
11 within three minutes, the level of contaminants would  
12 rise to the point where they threatened to damage the  
13 steam generator and turbine?

14 MR. GLASSMAN: Objection, I don't think  
15 that is his testimony at all.

16 MR. STEWART: I am asking what his  
17 testimony was.

18 MR. GLASSMAN: I don't want any words put  
19 in the witness's mouth.

20 MR. STEWART: It can be answered yes or no.

21 A Three minutes would have been the total cycle  
22 time to go from one point back to that point. There  
23 was less time to go from the condensate polishing  
24 units into the steam generator to the turbine, and  
25 if you had the proper contaminants, it could happen

2 in a very short time.

3 Q Where do the contaminants come from?

4 A If you talk to a chemist, he will tell you  
5 they are always there. They hide out in little nicks  
6 and cracks and crannies, and just all of a sudden  
7 when you are not suspecting, they jump out.

8 Q Do you have any understanding where they  
9 would come from, independent of what a chemist might  
10 say of them jumping out of nooks and crannies?

11 A One place they could come from is COV-12 had a  
12 dead leg that would have contained 100 gallons of water  
13 and could be pure pollutants.

14 Q To your knowledge, did anyone ever  
15 deliberately pour pollutants in the dead leg of COV 12?

16 A No.

17 Q Are you familiar with the term "plant  
18 shutdown"?

19 A Yes.

20 Q What is a plant shutdown?

21 A When you would be operating at power, and you  
22 would shut down a plant.

23 Q That would be something you do  
24 deliberately?

25 MR. GLASSMAN: Objection. I am not sure

1

2

what you mean by "deliberately." Are you

3

talking with malice or forethought?

4

MR. STEWART: Something the operators

5

could do upon request.

6

A You could have a normal plant shutdown, or you

7

would have a shutdown that would occur after a trip.

8

Q How long would it take to perform a

9

normal plant shutdown?

10

A From full power to decay heat is approximately

11

20 hours.

12

Q How long would it take to trip the

13

reactor during the course of a normal plant shutdown?

14

A The amount of time it would take for the rods

15

to insert. As I remember, that is three seconds.

16

Q As a general matter in the industry, is

17

it preferable to have the operators take the plant to

18

an ordinary shutdown or have the reactor trip

19

unexpectedly?

20

MR. GLASSMAN: Objection. The question

21

doesn't have any foundation laid for Mr. Toole's

22

general understanding of the industry.

23

Q You are a licensed control room operator,

24

are you not?

25

A I had been licensed, yes.

2 Q And you are a licensed senior reactor  
3 operator; is that correct?

4 A I had had a senior reactor operator license.

5 Q And you went through some number of  
6 training programs from the late 60's until 1977;  
7 is that right?

8 A I had training in that time frame, yes.

9 Q And you also made a point, I believe, of  
10 reading periodicals and other information relating  
11 to the nuclear industry; is that right?

12 A I read quite a bit of information, yes.

13 Q At any point during your training or your  
14 reading or your work experience, did you ever form an  
15 opinion whether or not it was preferable to deliberately  
16 shut a reactor down or have it undergo a reactor trip?

17 A If you could have the time frame to have a  
18 controlled shutdown, that would be the desired method  
19 to use the shutdown of a plant.

20 Q Would it have been possible to take a plant  
21 to a controlled shutdown while a condensate was being  
22 run through condensate bypass at TMI-2?

23 A I don't know how much flow the condensate  
24 bypass would have sustained. It is not as big a line  
25 as the condensate line, and because of line size,

2 I think it would have maintained something less than  
3 100 percent power.

4 Q Did the emergency feedwater system at  
5 TMI-2 have a lesser capacity than the main feedwater  
6 system?

7 MR. GLASSMAN: Asked and answered.

8 A As I testified before, the emergency feedwater  
9 has less capacity than the main feedwater.

10 Q By a substantial factor?

11 A Yes.

12 Q Is the emergency feedwater system sufficient  
13 to keep the reactor cooled during a plant runback?

14 A No.

15 Q Under what circumstances is an emergency  
16 feedwater system used for secondary side cooling?

17 A Emergency feedwater is designed to operate on  
18 loss of feedwater or loss of the reactor coolant pumps.

19 Q Is it your understanding that the condensate  
20 polisher system bypass would have been able to supply  
21 as much condensate to the feedwater system as the  
22 emergency feedwater system was able to supply?

23 A It would have supplied as much or more.

24 (Whereupon, a recess was taken.)

25

2 BY MR. STEWART:

3 Q During the break, did you have an  
4 opportunity to consult with counsel on any matter  
5 that was on your mind?

6 A I talked to counsel during the break.

7 Q Do you wish to change the testimony you  
8 have given so far today in any respect?

9 A No, I do not.

10 Q Did the letter which Mr. Ross and Mr.  
11 Brummer wrote to Mr. Miller and Mr. Seelinger mention  
12 that they had had difficulty in trying to open the  
13 condensate polishing system bypass valve from the  
14 control room, to your knowledge?

15 A What it says is: "Upon detection, the control  
16 room operator immediately tried to open CO-V12,  
17 condensate polisher bypass valve; however, he was  
18 unable to open this valve from the control room."

19 Q And the startup problem report has been  
20 numbered as Defendants' Exhibit 165.

21 Does Mr. Brummer ascribe a reason for the  
22 failure of the valve to open?

23 A He describes that he feels that either high  
24 Delta P across the valve or a low effluent flow may  
25 have prevented the valve from opening, but --

2 Q What is low effluent flow?

3 A I am sorry. That pertained to the signal he  
4 wanted to put in. What Brummer says is B&R should  
5 reevaluate the Delta P across CO-V12 as it would not  
6 open as designed during the occurrence.

7 Q In the letter to Mr. Miller and Mr.  
8 Seelinger from Mr. Ross and Mr. Brummer, there is a  
9 statement which I believe you read about the control  
10 room operator being unable to open the valve. Do  
11 you know what control room operator that was?

12 A No.

13 Q Do you know who the control room operators  
14 were who were on duty during this incident?

15 A No.

16 Q Do you know of any document that would  
17 reveal the identities of the control room operators  
18 who were in the control room at the time of this  
19 incident?

20 A Does it say in here the time of day this occurred?  
21 I don't remember seeing that. It says in here this  
22 occurred on October 19, 1977. If you took the control  
23 room operators' logbook, you might be able to determine  
24 who the operators were at this time.

25 Q To your knowledge, does a logbook record

2 the names of operators on shift at any given time?

3 A The operator signs his entry.

4 Q Would all operators make entries into the  
5 logbook on all shifts they worked?

6 A I don't know if they would or wouldn't.

7 Q Do you know of a procedure that relates  
8 to the keeping of the control room operators' log?

9 A I don't remember if Met Ed had a procedure at  
10 that time or not.

11 Q I direct your attention back to the  
12 sentence you had read in the letter Mr. Ross and Mr.  
13 Brummer sent to Mr. Miller and Mr. Seelinger. It  
14 states that "upon detection, the control room operator  
15 immediately tried to open CO-V12."

16 Do you know of any procedure that  
17 instructed the operator to open this valve in response  
18 to a loss of feedwater condition?

19 A No, I do not.

20 Q Were you told by anyone of the reasons  
21 they suspected why CO-V12 could not be opened from the  
22 control room?

23 A I don't remember any reason. The letter is  
24 an indication of what Met Ed thought at the time.

25 Q Would the Delta P across the condensate

2 polishers be high if the outlet valves to all the  
3 condensate polishers were closed while the feedwater  
4 system was in operation?

5 A Yes.

6 Q Were you told by anyone at this time that  
7 one reason bypass valves could not be opened from the  
8 control room was the high Delta P across the valve?

9 MR. GLASSMAN: I object. I think the  
10 witness just testified that he didn't recall  
11 any reasons or being told any reasons.

12 MR. STEWART: I think he can answer the  
13 specific question, if he knows the answer.

14 A I don't remember at that time being told that.

15 Q On Defendants' Exhibit 165, the first page,  
16 the third sentence which you wrote under the proposed  
17 resolution states: "We have previously operated  
18 CO-V-12 without problems."

19 Under what circumstances had that valve  
20 been operated before?

21 A I remember specifically CO-V12 had been operated  
22 to bypass flow around the demineralizers during the  
23 chemical cleaning.

24 Q Was the valve operated while there was  
25 flow through the polishers?

2 A As I remember, I believe it was.

3 Q Were the outlet valves and the polishers  
4 open at the time the bypass valve was operated?

5 A I don't remember right now whether they were or  
6 were not.

7 Q Was there a test procedure that would  
8 describe the manner in which the bypass valve was  
9 to be opened during that test?

10 A I don't know that. That would be documented  
11 specifically.

12 Q You said it was the hydro test or the  
13 flushing of the polishers?

14 A I referred to the chem cleaning.

15 Q Do you know what test procedures related  
16 to the chem cleaning of the condensate polishing  
17 system?

18 A The chem cleaning was a procedure.

19 Q Do you remember the number of that  
20 procedure?

21 A No, I do not.

22 Q Was it a procedure that was specifically  
23 oriented to the condensate polishing system?

24 A It was orientated to the chemical cleaning of  
25 the secondary plant of which the condensate polishers

2 were part.

3 Q Do you recall when the chemical cleaning  
4 of the condensate polishers occurred?

5 A No, I do not.

6 Q Do you recall generally what year it was  
7 that occurred?

8 A No.

9 Q Was it before or after November 1977?

10 A I believe it was before November 1977.

11 Q When was feedwater circulated through the  
12 secondary plant at TMI for the first time?

13 A What do you mean by "circulated through the  
14 plant"?

15 Q Did there come a time when the secondary  
16 plant at TMI-2 was completed?

17 A It would have been completed to support different  
18 evolutions along the way.

19 Q Did there come a time when feedwater was  
20 put into the secondary plant at TMI-2?

21 A When water flowed into the steam generators?

22 Q Sure.

23 A Yes.

24 Q When was that, to the best of your  
25 recollection?

2 A That would have been in early 1977.

3 Q That would have been before or after the  
4 chemical cleaning of the condensate polishers?

5 A That would have been after.

6 Q So at the time that the chemical cleaning  
7 of the polishers occurred, there was no feedwater  
8 flow through the secondary plant; is that fair to say?

9 A At the time the chemical cleaning occurred,  
10 there was a jumper that ran from the feedwater line to  
11 the main steam line that bypassed the steam generators.  
12 We chem-cleaned the condensate system, the feedwater  
13 system, through a jumper and through the steam system  
14 and out to the chem cleaning pits.

15 Q What was the purpose in circulating  
16 feedwater along the path that you described?

17 A To chemically clean the pipe.

18 Q Was the chemical cleaner circulated  
19 through that piping at the same rate that feedwater  
20 is circulated through the piping during ordinary  
21 operation of the plant?

22 A A lesser rate.

23 Q How much less?

24 A As I remember, we had a pump installed that was  
25 used to circulate the chemicals, and it was in the

1

2

ball park of 3000 gpm.

3

Q I believe you already testified as to the capacity of the feedwater system under ordinary operation; is that right?

4

5

6

A Yes.

7

Q Would a lesser flow through the secondary plant result in a lesser Delta P across the bypass valve?

8

9

10

A Yes.

11

Q What other circumstances was the bypass valve operated under prior to November 1977?

12

13

A As I testified before, I don't remember a reason to operate the bypass valve.

14

15

Q To your knowledge, was the use of the bypass valve drain for chemical cleaning the only time the bypass valve was used prior to November 1977?

16

17

18

A That was the only time I remember.

19

Q After you received the startup problem report from Mr. Brummer, did you conduct any tests on the bypass valve to determine why it did not open upon demand from the control room?

20

21

22

23

MR. GLASSMAN: This had been answered

24

before.

25

MR. STEWART: Not this question. It has

2

not even been asked before.

3

MR. GLASSMAN: Maybe you used a different word. Test, investigation. We can go through the dictionary. I will let him answer the question.

4

5

6

7

MR. STEWART: The question is directed only to tests conducted on the bypass valve.

8

9

A I don't remember if I did or if I did not test this valve.

10

11

Q Do you remember whether or not you told someone else to test the valve or have the valves tested?

12

13

14

A I don't remember if I did or did not.

15

16

17

18

Q After reading the startup problem report submitted to you by Mr. Brummer and its attachment, did you have any conclusions of your own considering the reason why the bypass valve did not operate?

19

A I believe I did.

20

21

Q What were your conclusions?

A I don't remember.

22

23

Q But you did have conclusions at the time; is that correct?

24

A I believe I did.

25

Q Did you write them down anywhere?

2 A I don't see them here, and I don't remember if  
3 I did.

4 Q Do you remember discussing your conclusions  
5 with anyone?

6 A No, I do not.

7 Q Did you conduct or have conducted any  
8 tests on the valve's operation after receiving the  
9 startup problem report to determine whether or not  
10 it was serviceable?

11 A I don't remember if I did or if I didn't.

12 Q Do you recall conducting any tests on the  
13 switch in the control room after receiving the  
14 problem report to determine whether or not it was  
15 operable?

16 A I don't remember if I did or didn't.

17 Q Do you remember conducting any investigation  
18 to determine whether or not the control room operators  
19 had attempted to open the bypass valve in the correct  
20 fashion?

21 A I don't remember if I did or didn't.

22 Q I direct your attention again to the first  
23 page of this exhibit and to the last few words under  
24 the proposed resolution section where you state:  
25 "therefore we do not consider the Delta P to be the

2 problem with the valve operation."

3 Had you been told by Mr. Brummer or Mr.  
4 Ross that that was their belief as to the reason why  
5 the valve failed to open on October 19, 1977?

6 A The problem report in the problem description  
7 says: "Burns & Roe should reevaluate the Delta P  
8 across CO-V12 as it would not open as designed during  
9 the occurrence."

10 Q So in other words, they had told you that  
11 was their belief as --

12 MR. GLASSMAN: Objection. The testimony  
13 of the witness is that the problem description  
14 contains certain information. There has been  
15 no testimony as to any conversation on this  
16 subject.

17 Q Do you recall hearing from Mr. Brummer or  
18 Mr. Ross that that was their belief as to the reason  
19 the valve didn't open?

20 A I don't recall that.

21 Q The last two sentences on the first page  
22 of Defendants' Exhibit 165 state: "No further action  
23 required by this PR. If when the plant is restored  
24 the problem is better defined, we will resolve the  
25 problem."

2 Did you consider your statement a final  
3 disposition of this problem report?

4 A I signed that the action was completed, and I  
5 considered at that time this problem report complete.

6 Q And because the problem report was complete,  
7 did that mean that no one else had a responsibility  
8 to take any action with respect to it?

9 A With respect to the problem report?

10 Q Yes.

11 A That's correct.

12 Q Was your decision that action was completed  
13 on the problem report reviewed by anyone?

14 A I don't remember if it was or if it was not.

15 Q Was it the ordinary practice for the test  
16 working group to review problem reports that had been  
17 closed out?

18 A No, it was not.

19 Q Do you know of any other body at TMI who  
20 reviewed the closing out of startup problem reports?

21 A No, I do not.

22 Q So to your knowledge, your decision that  
23 action was completed was the last thing that was done  
24 with respect to this problem report; is that correct?

25 MR. GLASSMAN: If you know.

2 A As far as I know.

3 Q To your knowledge, was the condensate  
4 polishing system cleaned, repaired, and reconditioned  
5 after the discoveries which Mr. Ross and Mr. Brummer  
6 had made in the aftermath of the October 19, 1977  
7 loss of feedwater?

8 MR. GLASSMAN: Objection to the use of  
9 the word "discovery" and the characterization  
10 of Mr. Brummer. If you want to talk about after  
11 the date of this memo --

12 MR. STEWART: See if you can answer that  
13 question.

14 A The memo dated November 14, 1977 identifies that  
15 "As directed, his people dismantled, inspected,  
16 cleaned and reassembled all 42 of the diaphragm  
17 operated air valves on the condensate polishing  
18 regeneration skid, since these valves would provide  
19 an interface point in the event of a ruptured diaphragm.  
20 In addition all instrument air lines have been blown  
21 down to insure that all moisture has been removed  
22 from these lines."

23 Q What did you understand that language to  
24 mean?

25 A What I understood it to mean was that the area

2 Met Ed was concerned with was inspected, and the  
3 problems encountered while inspecting were corrected.

4 Q Was it also your understanding that the  
5 system had been cleaned and repaired back to normal  
6 operating condition by Mr. Brummer and Mr. Ross or  
7 whoever they were working with or for?

8 A 42 valves were.

9 Q Do you know whether 42 valves were all the  
10 valves in the system?

11 MR. GLASSMAN: Objection. I believe the  
12 witness was earlier asked how many valves there  
13 were and if he knew, and he testified based on  
14 this document, there was a mention of 42, but  
15 he did not have any recollection of the exact  
16 number.

17 MR. STEWART: If he can answer it.

18 A I don't remember how many valves were in the  
19 system.

20 Q I direct your attention back to the first  
21 page of this exhibit. You wrote: "If when the plant  
22 is restored the problem is better defined, we will  
23 resolve the problem," did you not?

24 A Yes,

25 Q Did there come a time when you learned

2 that a problem of the nature described by Mr. Brummer  
3 and Mr. Ross recurred at TMI-2?

4 A The exact same problem?

5 Q The problem of water being found in the  
6 instrument air lines.

7 MR. GLASSMAN: Objection. I think we  
8 are talking about the testimony of counsel now.  
9 There has been no testimony about Mr. Brummer or  
10 Mr. Ross finding water in the instrument air  
11 lines. There has been testimony about what the  
12 document says, about what Mr. Toole understood,  
13 but I think you are putting words in the witness's  
14 mouth. It is an inappropriate question.

15 Q To your knowledge, did Mr. Brummer and  
16 Mr. Ross find water in the instrument air lines and  
17 any air operated valves of the condensate polishing  
18 system in November 1977?

19 A This letter doesn't say that they were the ones  
20 who found the water, and I don't know if they were  
21 the ones or were not the ones.

22 Q To your knowledge, did anyone find water  
23 in the condensate polishing system valves and  
24 instrument air lines in the aftermath of the October  
25 19, 1977 loss of feedwater transient?

2 A This letter says that water was either found or  
3 indicated that water had been in the lines, but it  
4 doesn't say who did it or found it.

5 Q Did there come a time when you heard that  
6 water had once again been found in the instrument air  
7 lines of the condensate polishing system at TMI-2?

8 MR. GLASSMAN: Objection to the question,  
9 your use of the words "once again." If you want  
10 to ask him if he knows about an event --

11 MR. STEWART: You instruct him not to  
12 answer the question?

13 MR. GLASSMAN: In the current form, yes.  
14 You can reask the question and get the information  
15 you are looking for without trying to compare  
16 events with no foundation for the comparison.

17 Q After November 1977, did anyone tell you  
18 that they found water in the instrument air lines or  
19 in the condensate polisher air operated valves?

20 MR. GLASSMAN: After November 1977?

21 MR. STEWART: That's right.

22 A On page 2 of the letter dated November 14, 1977,  
23 there are items here pertaining to installing drain  
24 traps and blowing down the air compressors. This  
25 was a function that they blew down the drain traps and

2 the air compressors, and I believe I remember talking  
3 to people who found water in those when they blew  
4 them down.

5 Q In the aftermath of the October 1977  
6 transient?

7 A Yes.

8 Q You referred to page 2 of this letter,  
9 and I believe on page 2 and page 3 there are nine  
10 enumerated items. Are those items that Mr. Brummer  
11 and Mr. Ross suggested should be done?

12 A They say these should be acted upon to preclude  
13 a reoccurrence.

14 Q To your knowledge, was the desiccant  
15 condition indicator on the instrument air dryers  
16 changed or replaced after November 14, 1977?

17 A I don't remember.

18 Q Were the air and water controls in the  
19 condensate polishing regeneration system completely  
20 realigned after November 14, 1977?

21 A I don't know if they were all completely  
22 realigned.

23 Q Were some?

24 A There is an indication here that for 42 valves  
25 they were.

1

Q What was done to those 42 valves?

2

A They were disassembled and cleaned.

3

Q Is that what you understand the word "realign" to mean?

4

5

A When you say "completely realigned," I don't know what that means.

6

7

Q It is your understanding that the disassembly, cleaning, and reassembly of the 42 valves though was what Mr. Brummer and Mr. Ross were referring to, using the words "completely realigned"; is that correct?

8

9

10

11

12

A No, they would have meant more than that.

13

14

Q Was more than that done?

15

A I don't know.

16

Q Was the air control loop for valve C-5 checked out to insure proper operation?

17

A I don't remember what C-5 is.

18

Q Was a problem report on valve CO-V12 submitted, to your knowledge?

19

20

A That was the problem report we discussed earlier.

21

Q Was a drain trap installed on control lines on the condensate polisher discharge valves, if you know?

22

23

24

A I remember a drain trap being installed in that

25

Toole

1

2

area on the air system.

3

Q Do you remember when it was installed?

4

A No, I do not.

5

Q Do you know whether or not it was installed in the year 1977?

6

7

A I believe it was installed after November 14, 1977. I don't know whether it was in the year 1977 or not.

8

9

10

Q Do you know how long after November 14, 1977 it was installed?

11

12

A No, I do not.

13

14

Q Was a preventive maintenance program developed to take dew readings of the instrument air system on a minimum of once a week?

15

16

A I don't remember.

17

18

Q Was a preventive maintenance program set up to take dew readings at the instrument air dryer and at the condensate polishing control panel at a minimum of once a week?

19

20

21

A I don't remember.

22

23

Q Was the operations log revised to require blowing down the air compressors on each mid-shift?

24

25

A I don't remember.

Q Was the amount of water in the air

2 compressors recorded in the auxilliary operator's  
3 log after November 14, 1977?

4 A I don't remember.

5 Q Were any abnormal amounts of moisture  
6 logged in the auxilliary operator's log or in the  
7 operations log after November 14, 1977?

8 A I don't remember.

9 Q Was the operations log revised to require  
10 blowing down the instrument air line that feeds the  
11 condensate polishing control panel each mid-shift to  
12 require recording of any abnormal moisture levels in  
13 the auxilliary operator's log after November 1977?

14 A The operations logs were not in my scope of  
15 responsibilities, and I don't remember.

16 Q One way or the other?

17 A Right.

18 Q Were check valves SA-V360 and the two  
19 check valves that are circled on Figure 1 attached to  
20 this memo inspected, if you know?

21 A I don't know one way or the other.

22 Q After November 1977, did you assign anyone  
23 from your organization to monitor the performance of  
24 the condensate polisher system on a continuing basis?

25 A I would say yes.

2 Q Who did you assign to do that?

3 A During the power escalation program, we had  
4 obtained chemical engineering support to be used to  
5 support the operation of the condensate demineralizers  
6 and monitor feedwater and primary plant chemistry.

7 Q Did you assign anyone from that group of  
8 persons to supervise the operation of the system on  
9 an ongoing basis?

10 A They monitored it very closely.

11 Q Did they report to you on the results of  
12 their monitoring?

13 A Yes, they did.

14 Q You used the term "power escalation  
15 program." What is a power escalation program?

16 A When we started producing nuclear heat on up to  
17 100 percent power.

18 Q When did that escalation program begin?

19 A Around April of 1978.

20 Q When did it end?

21 A We had a short intermission from sometime in  
22 May until September, and then it ended in December.

23 Q What was the cause of the short intermission  
24 you referred to a minute ago?

25 A We had a few minor problems with the main steam

2 relief valves.

3 Q From May 1978 to September 1978, was the  
4 primary plant not running?

5 A That's correct.

6 Q Did the persons you assigned to work on  
7 the condensate polishing system continue to work on  
8 the condensate polishing system from May '78 to  
9 September '78?

10 A I don't remember.

11 Q Do you remember whether or not they  
12 remained on the site?

13 A No, I don't remember that.

14 Q One way or the other; is that what you  
15 are saying?

16 A I believe at least one of the individuals  
17 remained on site.

18 Q Do you have any particular individual  
19 in mind who remained on the site?

20 A Yes, William Pitka, P-i-t-k-a.

21 Q Did he continue to report to you?

22 A Yes,

23 Q What matters was he assigned to report to  
24 you?

25 A Primary and secondary plant chemistry.

2 Q Anything else?

3 A That was his main function.

4 Q Chemistry?

5 A Yes.

6 Q Did you become aware in mid-May 1978  
7 of the failure of the outlet valves and condensate  
8 polishers 6, 7 and 8?

9 A That doesn't mean anything to me.

10 Q Was the event of October 19, 1977 --

11 MR. GLASSMAN: Objection. I am not sure  
12 we have an exact date.

13 I withdraw my objection. My apologies.

14 Q -- and the events surrounding that  
15 plant's transient the last time you heard of a  
16 malfunction or failure of the outlet valves on the  
17 condensate polisher at TMI-2, at least until the time  
18 of the accident?

19 A No.

20 Q When is the next time you heard of a  
21 failure of the outlet valves on the condensate  
22 polisher?

23 A I remember one occurring in sometime late in 1978.

24 Q Do you remember one occurring before late  
25 1978?

2 A Not at the moment,

3 MR. STEWART: Let me have marked as the  
4 next exhibit in order a memorandum to Jim  
5 Seelinger dated May 15, 1978, signed by  
6 W. H. Zewe. The subject is identified as  
7 water in service air and inst. air.

8 (Memorandum to Jim Seelinger dated May  
9 15, 1978, signed by W. H. Zewe, was marked  
10 Defendants' Exhibit 166 for identification, as  
11 of this date.)

12 Q I ask you to read this document, if you  
13 can.

14 Have you had an opportunity to read this  
15 document?

16 A Yes.

17 Q Have you ever seen this document before?

18 A I don't remember having seen this before. I  
19 may have seen it with counsel.

20 Q Were you ever told or made aware in any  
21 fashion before the time of the Three Mile Island  
22 accident in March 1979 of the matters set forth in  
23 this document?

24 A I don't remember being informed of this  
25 document.

2 Q What about the matters referred to in the  
3 document?

4 A There is an item in here, item 1 on the first  
5 page, CO-V12 being open on high polisher Delta P  
6 was identified in the problem report we previously  
7 discussed.

8 Q What about any other matters referred to  
9 in this document?

10 A I don't remember the other items.

11 Q Do you remember anyone telling you or  
12 do you remember learning from any source that water  
13 had been found in the instrument air lines at TMI-2  
14 in May 1978?

15 A I don't remember it being specifically defined  
16 to me that there was water found in the system.

17 Q Do you remember any general matter  
18 communicated to you with respect to this?

19 A It seems to me in general that I remember  
20 references to water being found in the air system  
21 and locations at various times, but this piece of  
22 paper doesn't tell me anything about water being found  
23 in the system. The date you are referring to doesn't  
24 mean anything to me.

25 Q Is it your best recollection that you never

2 knew in May 1978 or at any time after water had been  
3 found in the instrument air lines of the condensate  
4 polishing system in or about May 15, 1978?

5 A I believe what I said is that I was aware  
6 that there was discussion on water being found, and  
7 I don't remember how much or where or the details of  
8 the discussions on water being found.

9 Q Were you party to these discussions?

10 A I don't remember specific incidents of discussion  
11 of water at that time.

12 Q What is the source of your recollection  
13 that there were discussions on the subject of water  
14 in the instrument air lines?

15 MR. GLASSMAN: Objection. There has been  
16 no testimony that he has such a recollection.

17 MR. STEWART: I think the record will show  
18 otherwise.

19 Q Do you recall there being discussions on  
20 the subject of water found in the instrument air lines  
21 at TMI-2?

22 MR. GLASSMAN: We are talking of ever?

23 MR. STEWART: On or about May 15, 1978.

24 A I remember discussions of it. I don't remember  
25 the specific discussions or with whom,

2 Q Do you remember how many discussions there  
3 were?

4 A No, I do not.

5 Q Was it more than one?

6 A There was one in 1977, and it was discussed  
7 after 1977.

8 Q Was it a matter of continuing concern  
9 and discussion?

10 A It would be brought up on occasion, yes.

11 Q How frequently was it brought up?

12 A I don't remember.

13 Q Do you know what occasions would cause  
14 it to be brought up?

15 A If a problem occurred in the condensate  
16 demineralizer. It seemed, as I remember, that every  
17 time there was a problem in the condensate demineralizer,  
18 someone would say there is water in the air system.

19 Q Would these statements and discussions  
20 occur in the context of the meetings of the test  
21 working group?

22 A It wouldn't have been a requirement of the test  
23 working group to discuss an item like that.

24 Q Is it your recollection though that the  
25 discussions occurred in the context of the test working

2 group?

3 A I don't remember.

4 Q Do you remember whether or not the  
5 discussions you referred to were discussions that  
6 you held with other members of the GPU Startup Group?

7 A I don't remember who I specifically discussed  
8 it with.

9 Q Do you remember the period of time during  
10 which these discussions occurred?

11 A Between November 17, 1977 and December 23, 1978.

12 Q Would it be fair to say that these  
13 discussions occurred continuously throughout this  
14 period?

15 MR. GLASSMAN: Objection. The witness has  
16 already answered the question of whether there  
17 were continuous discussions. He gave an answer  
18 with regard to the frequency. There is no  
19 purpose for any further answer.

20 MR. STEWART: You instruct him?

21 MR. GLASSMAN: Yes.

22 Q You testified previously, I believe, that  
23 a man named Tom Hawkins worked for you.

24 A That's correct.

25 Q Did he report directly to you?

2 A Yes.

3 Q Was he the second in command of the Startup  
4 Group?

5 A Yes.

6 Q Did you and Mr. Hawkins work closely  
7 together?

8 A Yes.

9 Q Did you inform Mr. Hawkins in November  
10 1977 of the startup problem report you had received  
11 from Mr. Brummer?

12 A I don't remember doing that.

13 Q Was it a matter that you ordinarily would  
14 not have shared with Mr. Hawkins?

15 A It was not a matter that I would have not  
16 shared with Mr. Hawkins.

17 Q In November 1977, how much time altogether  
18 did you spend on responding to Mr. Brummer's startup  
19 problem report?

20 A I don't remember.

21 Q Do you recall whether it was more or less  
22 than a day?

23 A I would say it was less than a day.

24 Q Would you say it was more or less than an  
25 hour?

2 A I can't answer that.

3 Q Why not?

4 A I don't remember.

5 Q Did Mr. Hawkins make it a point to  
6 report to you the work he was doing?

7 MR. GLASSMAN: Objection, Which work are  
8 we talking about? All of his work?

9 Q Was it Mr. Hawkins' practice, to your  
10 knowledge, to report to you on the work he was doing?

11 MR. GLASSMAN: Same objection.

12 MR. STEWART: Any work.

13 MR. GLASSMAN: All work that he ever did,  
14 or some specific work?

15 MR. STEWART: The work he performed while  
16 working for Mr. Toole.

17 Q You were Mr. Hawkins' supervisor?

18 A Yes.

19 Q Did you make it a point to keep yourself  
20 abreast of the work Mr. Hawkins was doing?

21 A Yes.

22 Q Did Mr. Hawkins make it a point to keep  
23 you apprised of the work he was doing, to your  
24 knowledge?

25 A To my knowledge, he did.

2 Q Where is Mr. Hawkins' office?

3 A Adjacent to mine.

4 Q How often did you see Mr. Hawkins?

5 A Every day, six days a week.

6 Q Was it your belief in 1977 and 1978 that  
7 you had an understanding of the work Mr. Hawkins was  
8 doing on a daily basis?

9 A Yes, I was.

10 Q Do you remember Mr. Hawkins informing you  
11 at all about the matters discussed in Defendants'  
12 Exhibit 166 for identification?

13 A No, I do not.

14 Q I direct your attention to the second page  
15 of this document. There is some writing on the  
16 left-hand side of this diagram. Do you recognize the  
17 handwriting?

18 A It looks to me like there is a number of  
19 different handwritings.

20 Q Do you see the word "therefore"?

21 A Yes.

22 Q Do you recognize the handwriting following  
23 the word "therefore"?

24 A The handwriting following the word "therefore"  
25 is similar to the handwriting of Tom Hawkins.

1  
2 Q Is that Mr. Hawkins' name at the bottom  
3 of that writing?

4 A It says, as best I can read it, "Tom Hawkins."

5 Q Do you recognize that as his signature?

6 A That is not clear enough for me to identify his  
7 signature. It is printed.

8 Q There is a date under the name Hawkins.  
9 Can you tell what the date is?

10 A No.

11 Q Does it appear to be a date in May 1978?

12 A It is a date in May.

13 Q Who was Mr. Seelinger in May 1978?

14 A I believe Seelinger's position at that time was  
15 technical supervisor, Unit No. 2.

16 Q Who was Mr. Zewe?

17 A Mr. Zewe was a shift supervisor.

18 Q Did Mr. Zewe directly or indirectly report  
19 to Mr. Seelinger?

20 A He did not report to Mr. Seelinger.

21 Q What were Mr. Seelinger's responsibilities  
22 at this time, if you know?

23 A He was technical engineer for Unit No. 2,

24 Q What was involved in that position?

25 A The engineers who worked on Unit 2 reported to

2 Mr. Seelinger.

3 Q What was the scope of Mr. Seelinger's  
4 authority, if you know?

5 A He was in charge of the engineers.

6 Q Was Mr. Seelinger also in charge of the  
7 making of the modifications to Unit 2, if you know?

8 A Mr. Seelinger was not in charge of making changes  
9 to Unit 2.

10 Q Who was, if you know?

11 A 5/15/78?

12 Q Yes.

13 A The GPU project manager.

14 Q Who was that again in May 1978?

15 A I believe at that time it was John Barton.

16 Q Did Mr. Barton sit on the Plant Operations  
17 Review Committee?

18 A No, he did not.

19 Q Do you know of any reason why Mr. Hawkins  
20 from the Startup Group would have reviewed a drawing  
21 having to do with proposed modifications to the  
22 instrument air system of TMI-2 in May 1978?

23 MR. GLASSMAN: Objection so far as the  
24 question is asking for Mr. Hawkins' state of  
25 mind. If Mr. Toole was told a reason by Mr.

1  
2 Hawkins, he can testify as to that.

3 MR. STEWART: Mr. Toole can also testify  
4 as to what the practice was at Three Mile  
5 Island of the work of people who worked for him.

6 MR. GLASSMAN: If that is the question,  
7 you can rephrase the question.

8 MR. STEWART: The question is clear.

9 THE WITNESS: Would you repeat the question.

10 (Record read.)

11 MR. GLASSMAN: Objection again. The further  
12 objection, it calls for a hypothetical answer  
13 as phrased. I think if you rephrase the question,  
14 we can proceed.

15 MR. STEWART: I will withdraw the question.

16 Q Did members of the GPU Startup Group have  
17 responsibility for assisting employees of Metropolitan  
18 Edison in reviewing possible changes to the design  
19 of the secondary plant at TMI-2 in May 1978?

20 A It was a function that we performed, yes.

21 Q To your knowledge, did it occur from time  
22 to time that members of the Metropolitan Edison plant  
23 staff would approach Mr. Hawkins or anyone else in  
24 your group to ask for his assistance or opinion on  
25 the subject of proposed plant changes?

2 A Yes, it would occur.

3 Q When that happened, was it the practice  
4 of the Startup Group to have such a request reported  
5 to you as the supervisor of the Startup Group?

6 A If a person in the Startup Group identified a  
7 design change that they felt needed to be reviewed,  
8 they would develop a field questionnaire or problem  
9 report.

10 Q Would they ever inform you they had been  
11 approached by a member of the Metropolitan Edison  
12 plant staff and asked for assistance?

13 A They may or they may not have.

14 Q Did you make work assignments to the  
15 people who worked for you?

16 A I made work assignments. Not everything they  
17 did.

18 Q Who besides yourself made work assignments  
19 for Mr. Hawkins?

20 A I was the only direct supervisor of Mr. Hawkins.

21 Q If Mr. Hawkins had other work that he  
22 had been asked to do, would he ordinarily inform you  
23 he did additional work from other sources?

24 MR. GLASSMAN: Objection. I don't think  
25 there has been any foundation laid for an idea

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

that he had work from other sources. If you are trying to get the question of sometimes he assisted Met Ed people --

Q To your knowledge, was Mr. Hawkins ever approached by members of the Metropolitan Edison plant staff and asked for his assistance on possible changes to the plant?

A I believe he was.

Q When this occurred, did he ordinarily inform you of the fact that he had been approached?

A If he thought it required my attention.

Q Did he ordinarily inform you of this fact by merit of your being his supervisor?

A Yes.

Q Do you recall hearing from Mr. Hawkins in May 1978 that he had been approached by anyone from Metropolitan Edison on the subject of modifications to the service or instrument air systems at TMI-2?

A No.

Q Is your answer that you have no recollection one way or the other?

A That's correct.

MR. STEWART: Let's have marked as the next exhibit in order a document dated May

1  
2 16, 1978, which appears to be a memorandum from  
3 Mr. Seelinger to John Brummer.

4 (Memorandum dated May 16, 1978, from Mr.  
5 Seelinger to John Brummer, was marked Defendants'  
6 Exhibit 167 for identification, as of this date.)

7 Q I ask you to look at this document.

8 Have you seen this document before?

9 A Not that I remember.

10 Q Who did Mr. Bezilla work for in May 1978?

11 A I believe he worked for Mr. Seelinger.

12 Q Who did Mr. Brummer work for in May 1978?

13 A I believe he worked for Mr. Seelinger.

14 Q Do you recall receiving the GPU problem  
15 report on or after May 16, 1978, having to do with  
16 possible modifications to the service air and  
17 instrument air systems at TMI-2?

18 A No, I do not.

19 Q Do you recall receiving a GPU problem  
20 report on or after May 16, 1978 having to do with  
21 installing an interlock to make the condensate polisher  
22 system bypass valve an automatic valve that would open  
23 on high Delta P across the condensate polishers?

24 A No, I do not.

25 Q Do you recall receiving a GPU startup

2 problem report on or after May 16, 1978 asking that  
3 valve SA-V356 be moved?

4 A No, I do not.

5 Q Do you recall receiving any of those  
6 three requests in any other forms from anyone after  
7 May 16, 1978?

8 A No, I do not.

9 Q You have testified earlier that you knew  
10 of a situation in late 1978 involving, I believe,  
11 water in the instrument air lines. Is that an  
12 accurate summary of the testimony you have given this  
13 afternoon?

14 A I don't believe that I identified remembering  
15 water in the air lines on any specific date.

16 Q Do you remember learning about water in the  
17 instrument or service air lines at TMI-2 at any point  
18 in 1978 after May?

19 A I don't remember the details of water occurring  
20 in the air system at any specific point in time after  
21 that.

22 Q Do you remember in a general sense?

23 A No.

24 Q Do you remember discussions about water  
25 being found in instrument air and service air lines

2 continuing after May 1978?

3 MR. GLASSMAN: Objection. I don't know  
4 what the basis of "continuing" is or whether  
5 it is referring back to something else.

6 MR. STEWART: I believe Mr. Toole testified  
7 earlier that there had been discussions  
8 continuously from November 1977 to the end of  
9 1978 on the subject of water in the air lines.

10 MR. GLASSMAN: You highlighted my  
11 objection. He did not testify to that. Those  
12 were your words. You asked him whether or not  
13 there were continuous discussions, and he gave  
14 an answer relating to a certain frequency of  
15 such discussions. He did not use those words.  
16 I don't want to imply there was anything  
17 continuous or not continuous.

18 MR. STEWART: Let me ask the question once  
19 again so we can determine what Mr. Toole's  
20 testimony is.

21 MR. GLASSMAN: I object to your asking  
22 the question once again.

23 MR. STEWART: I will if you continue to  
24 object to it.

25 Q After November 1977, did you have

2 discussions with anyone else in the GPU organization  
3 on the subject of water in the instrument air or  
4 service air lines at TMI-2?

5 A As I testified before, I believe that there  
6 were discussions. I don't remember personally  
7 discussing it with any individual on any specific date.

8 Q Do you remember the fact that there were  
9 discussions though?

10 A I think I remember discussions occurring, yes.

11 Q And you were party to those discussions?

12 A I don't remember whether I was or was not.

13 Q You were aware of those discussions,  
14 however?

15 A I think I remember discussions had taken place.

16 Q And you were aware that the discussions  
17 were on the subject of water in the service and  
18 instrument air lines; is that right?

19 A Yes.

20 Q Do you remember when you last heard of  
21 such a discussion?

22 A No, I do not.

23 Q Was it in the year 1978?

24 A Excluding the accident?

25 Q Yes.

2 A Of 1979?

3 Q Yes.

4 A I believe I remember something did occur in 1978.

5 Q Do you remember when it occurred in 1978?

6 A No.

7 Q Do you remember the nature of the event?

8 A Not in detail,

9 Q What is your recollection of the nature of  
10 the event?

11 A I cannot construct the specifics in my mind.

12 Q Did the event involve water in the  
13 instrument or service air lines?

14 A I don't remember.

15 Q Did the event involve water in any air  
16 lines?

17 A As I said, I remember discussions on water  
18 appearing in the air lines, and I don't remember the  
19 specifics.

20 MR. GLASSMAN: This line of questioning  
21 I think borders on harassment, to ask him over  
22 and over again on what he testified he had no  
23 specific recollection.

24 MR. STEWART: His testimony is less clear  
25 than that.

1  
2 Q Were the discussions you referred to  
3 discussions that occurred in the year 1978?

4 A I believe I have said I don't remember specific  
5 discussions in the year 1978.

6 Q Do you remember generally the fact of  
7 discussions in the year 1978?

8 A I think I remember that discussions occurred in  
9 the year 1978.

10 Q Defendants' Exhibit 165 for identification  
11 contains a handwritten statement, I believe, that you  
12 wrote. At the bottom of the page, "If when the plant  
13 is restored, the problem is better defined, we will,  
14 resolve the problem."

15 Did the discussions you have referred to  
16 in your testimony moments ago remind you of the  
17 problem raised by Mr. Brummer in this GPU startup  
18 problem report?

19 MR. GLASSMAN: Are we asking whether  
20 some discussions that may have occurred in 1978  
21 now remind him or then reminded him?

22 MR. STEWART: Then reminded him at the  
23 time he heard of the discussions.

24 A Not that I remember.

25 Q Just so I am clear, your testimony is that

2 at some point after November 1977, you became aware  
3 of the fact that discussions were occurring on the  
4 subject of water in the instrument or service air  
5 lines, and at the time you heard those discussions,  
6 those discussions did not remind you of the problems  
7 raised by Mr. Brummer in the GPU startup problem  
8 report, Exhibit 165; is that correct?

9 A As I said before, I don't remember the specifics  
10 of those discussions, so I cannot construct anything  
11 about those discussions in my mind.

12 Q Do you remember taking any action in the  
13 year 1978 regarding modifications to the design of  
14 the instrument and service air systems on the  
15 condensate polishers at TMI-2?

16 A I don't remember taking any action in the year  
17 1978.

18 Q So would it be fair to say, from the time  
19 you completed the GPU startup problem report that has  
20 been numbered Defendants' Exhibit 165, until the time  
21 you left Three Mile Island in December 1978, you took  
22 no action on the subject of changing the design of  
23 the instrument or service air systems in TMI-2?

24 MR. GLASSMAN: Asked and answered. We  
25 know the period in which Mr. Toole was at TMI.

2

You can characterize the answer any way you wish.

3

There is no purpose in going over it three

4

different ways.

5

MR. STEWART: I think there is. Can he

6

answer the question?

7

MR. GLASSMAN: No, I direct him not to

8

answer.

9

MR. STEWART: On what ground? It is

10

harmful to your case?

11

MR. GLASSMAN: No. The answer has

12

already been given. It is six o'clock. We

13

have gone over things ad infinitum.

14

MR. STEWART: I think the witness's

15

testimony is unclear.

16

We are here at six o'clock in light of

17

your unilateral rescheduling of the deposition.

18

I don't think you should hide behind that.

19

MR. GLASSMAN: We're not hiding anything.

20

He answered the question three times.

21

Q At any time after November 17, 1977 to the

22

time you left Three Mile Island, were any equipment

23

changes made, to your knowledge, to the condensate

24

polishing system at TMI-2?

25

A I don't remember.

2 Q That there were or whether or not there  
3 were?

4 A Whether they were or were not made.

5 Q If they were made, would these changes  
6 have come to your attention?

7 A Yes.

8 Q Would they have been recorded in any  
9 document?

10 A Yes.

11 Q What document?

12 A A field questionnaire.

13 Q At any time from November 17, 1977, to  
14 the time you left Three Mile Island, did you take  
15 any action to have any plant procedure modified to  
16 provide for an operator response to the failure of  
17 the condensate polishing system?

18 A Plant procedures were not my responsibility.

19 Q So I take it your answer to the question  
20 is no.

21 A That's correct.

22 Q Did you take any action after November  
23 17, 1977 to have the plant training program modified  
24 to incorporate information concerning what operators  
25 should do upon a failure of the condensate polishing

1

2

system?

3

A No.

4

(Time noted: 6:00 p.m.)

5

6

\_\_\_\_\_  
Ronald J. Toole

7

8

Subscribed and sworn to before me

9

this day of 1981.

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25



## I N D E X

WITNESS	PAGE
Ronald J. Toole	282

## E X H I B I T S

DEFENDANTS' FOR  
IDENTIFICATION

157	Schedule for meetings of Unit No. 2 Operations Review Committee, April 24-29, 1978	286
158	Group of documents headed "Audit Report Finding Form," first page dated June 23, 1976	288
159	Document entitled "Superintendent's Event Report"	292
160	Document entitled "Technical Staff Analysis Report on Pilot-Operated Relief Valve (PORV) Design and Performance"	297
161	Document headed "Current Events: Power Reactors," bearing a date of September - 31 October 1977	301
162	Document entitled "Current Events: Power Reactors," relating to the period August-September 1975	303
163	Group of documents beginning with a memorandum dated September 27, 1973, addressed to J. E. Wright	307

## INDEX TO EXHIBITS (continued)

DEFENDANTS' FOR IDENTIFICATION	PAGE
164      Multipage document, first page entitled "Burns & Roe Inc. Field Questionnaire No. 1577," dated February 19, 1977	355
165      Document entitled "GPU Startup Problem Report," with attachment	413
166      Memorandum to Jim Seelinger dated May 15, 1978, signed by W. H. Zewe	481
167      Memorandum dated May 16, 1978, from Mr. Seelinger to John Brummer	494

\* \* \*