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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

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

Plaintiffs, :

-against- : Civil Action No.
80 Civ. 1683
THE BABCOCK & WILCOX COMPANY and : (R.O.)
J. RAY McDERMOTT & CO., INC., :

Defendants. :
-----x

Deposition of The Babcock & Wilcox Company,
by NORMAN S. ELLIOTT, taken by Plaintiffs,
pursuant to Notice, at the offices of Kaye,
Scholer, Fierman, Hays & Handler, Esqs., 425 Park
Avenue, New York, New York, on Thursday,
February 5, 1981, at 1:40 o'clock in the afternoon,
before Charles Shapiro, a Certified Shorthand
Reporter and Notary Public within and for the
State of New York.



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Also Present:

EDWARD R. FREDERICK

DAVID TAYLOR

* * *

1
2 IT IS HEREBY STIPULATED AND AGREED by
3 and among the attorneys for the respective
4 parties hereto that the sealing, filing and
5 certification of the within deposition be,
6 and the same hereby are, waived; and that the
7 transcript may be signed before any Notary
8 Public with the same force and effect as if
9 signed before the Court.

10 IT IS FURTHER STIPULATED AND AGREED
11 that all objections, except as to the form
12 of the question, are reserved to the time of
13 trial.

14 * * *

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17
18 NORMAN S. ELLIOTT, having
19 been first duly sworn by the Notary Public,
20 was examined and testified as follows:

21 EXAMINATION BY MR. SELTZER:

22 Q Will you state your full name, please.

23 A Norman Shannonhouse Elliott, Jr.

24 Q By whom are you currently employed?

25 A Babcock & Wilcox.

2

Q What is your business address?

3

A Babcock & Wilcox, P.L. Box 1260, Lynchburg,
4 Virginia.

5

Q What is your present position?

6

A I am Manager of Training Services.

7

Q When did you first become Manager of
8 Training Services?

9

A The same position in 1972, September.

10

Q Is that the only position that you have
11 held with B&W?

12

A Effectively, yes. It has had different
13 names periodically.

14

MR. SELTZER: I would like to mark as
15 GPU Exhibit 41 a resume of Mr. Elliott.

16

(Resume of N. S. Elliott, Jr.
17 marked GPU Exhibit No. 41 for identification
18 as of this date.)

19

Q Can you identify GPU Exhibit 41, please?

20

A Yes. It's a general resume of the experience
21 and education of Mr. Norman Elliott.

22

Q Who prepared this?

23

A I am not sure, sir.

24

Q You didn't, is that what you are telling

25

me?

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2

A I don't remember.

3

4

Q You don't remember whether you prepared this?

5

A That's correct.

6

7

8

Q You mean you may have and you don't have any recollection of whether you did it or did not do it?

9

A I'm not sure, sir.

10

11

Q Is there anything on this that is inaccurate?

12

A No.

13

14

15

Q When you were with the General Electric Company from 1969 through 1972, were you engaged in any work there in connection with nuclear systems?

16

A No.

17

18

Q Were you engaged at General Electric in training?

19

A No.

20

21

22

Q Prior to going to work for General Electric you served in the United States Navy, is that right?

23

A That is correct.

24

25

Q Your resume, GPU Exhibit 41, shows that for four of the 11 years that you were working

1
2 in the Navy, you were engaged in special training.

3 Is it correct that for only four of 11
4 years you were involved in training in the Navy?

5 A No, that's not correct. You are -- the
6 indication on the resume of four years special
7 training included training and education of myself.

8 Q I see.

9 So that is not a reference to the fact
10 that you were training others, is that right?

11 A That is correct.

12 Q During the 11 years that you were in
13 the Navy, did you have any responsibilities for
14 training others to operate nuclear equipment?

15 A Yes.

16 Q For what period of time were you
17 responsible for training others to operate nuclear
18 equipment?

19 A The general time frame of 1965 through '67.

20 Q What was your position?

21 A I was an officer on a U.S. Navy submarine.

22 Q Which submarine?

23 A The U.S.S. STURGEON.

24 Q Was training your principal responsibility
25 for those two years on the STURGEON?

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2

A My principal responsibility on there was one of the officers of the ship, I was responsible for a group of people who were in my division or department and their training was part of my responsibility.

3

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7

Q What department?

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A I served in the Engineering Department and the Operations Department.

9

10

Q Did the people who were in your department

11

include people who were responsible for the

12

control room controlling the nuclear reactor

13

on the STURGEON? Let me rephrase that.

14

Did you have to do any training of the

15

people who operated the nuclear reactor on the

16

STURGEON?

17

A Yes.

18

Q Had they also received training

19

before they were assigned to the STURGEON?

20

A Yes.

21

Q Did you have any involvement in that

22

training before they came on board?

23

A No.

24

Let me explain that that was -- I was

25

a student in a similar training program, but I was

not one who was responsible for the direction of that training program.

Q During the period 1965 to 1967, what were your responsibilities on the U.S.S. STURGEON?

A My responsibilities were primarily the main propulsion system and at the end of that period I was the Operations Officer.

Q What did your duties consist of in being responsible for the main propulsion system?

A Main propulsion, it is mechanical equipment that propels the ship and includes the mechanical parts of the reactor coolant and reactor systems on the ship.

Q Were you also responsible for maintaining the drive shaft?

A Yes.

Q The screw?

A Essentially, yes.

Q What percentage of your working time aboard the STURGEON during the period 1965 to 1967 was taken up with activities involving training of people to operate the nuclear reactor?

A My personal involvement was something in the

2 order of 10 percent other than watch time when we
3 were training and qualifying people, in which case
4 that was about one-third of the time the ship was
5 at sea.

6 Q So 10 percent of your time was spent
7 in formal training, is that right?

8 A Yes, associated with formal training.

9 Q What do you mean "associated"?

10 A Maybe directing it, causing others to conduct
11 training, observing training of others, participation
12 in the qualifications of other personnel.

13 Q Other than that 10 percent of your time,
14 you say about a third of your time was spent on
15 watch?

16 A Yes.

17 Q And while you were on watch, you had to
18 be supervising people who were responsible for
19 running the propulsion system?

20 A That's correct.

21 Q So from time to time you might give
22 somebody pointers on how they could do their job
23 better?

24 A Is that a question, sir?

25 Q Yes.

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Q Yes.

A Would you -- please --

MR. WISE: Do you understand the question?

THE WITNESS: I don't really understand what the question asked --

MR. SELTZER: All right.

Mr. Shapiro, will you please repeat the question.

(Record read by the reporter.)

A I believe that's a statement.

Q Is that correct? That from time to time you would give people pointers on how they could do their job better while you were on watch?

A I did assist people in understanding their jobs and qualifying for positions other than what they were currently standing the watch on.

Q Is that something you did as part of a formal program?

A No. That was a part of my duties.

Q Did the Navy have a training center for training people to run nuclear reactors?

A The Navy has a program for the development

2 of people to run nuclear power plants, it has
3 numerous facilities that are utilized in the program.

4 Q During the years that you were in the
5 Navy, did the Navy have somebody who was in charge
6 of the program for training people to operate
7 nuclear reactors?

8 A Yes, with the qualification that we were
9 concerned with a training set of facilities which
10 were operated by the Department of the Navy and that
11 each command to operate the nuclear the nuclear
12 reactors had their own qualification.

13 Q What do you mean "each command"?

14 A Just what I said, sir.

15 Q I don't know what a command is, so that's
16 why I'm asking you.

17 A It's a ship or a station having an assigned
18 commanding officer.

19 Q Was the period '65 to '67 the period
20 of time that you were on the STURGEON?

21 A I was assigned on the STURGEON that period
22 inclusive -- through the complete year 1967.

23 Q During the time that you were an officer
24 on the STURGEON, did your duties include training
25 anyone on electronic or control-type equipment?

1

2 A Yes.

3 Q What types of control equipment?

4 A The steam generator level control system,
5 and the reactor rod control system, and the
6 reactor protection system.

7 Q Were you the Engineering Officer of the
8 watch?

9 A Yes.

10 Q Did you ever have any responsibilities
11 for training Naval personnel to operate nuclear
12 reactors before they came on board ship?

13 A No.

14 Q Between 1967 and 1972 when you joined
15 B&W, did you participate in any programs where
16 you were responsible for training people to operate
17 nuclear equipment?

18 A During the year 1967 I was an officer on board
19 the STURGEON, I served part of my watches --

20 Q I said between '67 -- so after the
21 STURGEON and before you joined B&W did you have
22 any responsibilities for training people to
23 operate nuclear equipment?

24 A During the period of 1968 through 1972,
25 prior to joining B&W, I did not personally train

anybody to operate nuclear equipment.

Q Are you telling me that you neither directly nor indirectly participated in the training of personnel to run nuclear equipment during those years?

A That is correct, sir.

Q Why did you leave General Electric?

A I wished to advance my career by moving to a position involving business direction, business management.

Q How did you find the job at B&W?

A From an ad in the New York Times.

Q Was B&W advertising for someone to manage their training services program?

A Yes, they were.

Q Do you remember when in 1972 you began work for B&W?

A September.

Q Who preceded you as Manager of Training Services?

A It is my understanding there was nobody. The group was -- it had a Group Supervisor.

Q What group had a Group Supervisor?

A Training Services.

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Q Who was the Group Supervisor?

A Mr. Stoll.

Q What is his first name?

A George.

Q Did George Stoll continue to work in training after you arrived?

A Yes.

Q Did he report to you?

A Yes.

Q How many professional employees were in the Training group at B&W when you became the Manager?

MR. WISE: What do you mean by "professional employees," just to clarify it for the witness?

MR. SELTZER: As opposed to secretaries.

A There were, as I remember, about five employees.

Q Including George Stoll?

A That would be a fair -- I'm not sure whether it is five or six, including Mr. Stoll.

(Continued on next page.)

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Q To whom did you report when you became the Manager of Training Services in September of 1972?

A Mr. Deddens.

Q Had Deddens interviewed you before you were hired?

A Yes.

Q Did he explain to you what your responsibilities would be?

A Generally, yes.

Q What did he tell you your responsibilities would be?

A Primarily to develop the training business as a portion of the services that B&W provided to its customers for a nuclear steam supply system.

Q Did Deddens indicate in any way that the training services had not been adequately developed previously?

A Not specifically.

Q Did he generally indicate to you that he wanted you to do a job of enhancing the training business being done by B&W?

A Yes.

Q Did he want you to develop programs

Elliott

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to go out and get more training business?

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A Yes.

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Q Did Deddens or anybody else indicate to you that B&W felt training was an area in which B&W could be making more money than it was making?

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A I would like to rephrase that, that the belief at the time was that training services was a growth opportunity for the company and it could expand its services.

11

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Q When you say it was a growth opportunity, it was an area in which the company could sell its services more widely than it had been?

15

A Yes.

16

17

18

Q And it could make more profit on training services than it had been, isn't that right?

19

A Profit in that it sold more, yes.

20

21

22

23

Q When you took over Training Services, it was an objective, wasn't it, to sell training services for more than it cost B&W to provide them, isn't that correct?

24

A Yes.

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Q If you sell for more than it costs

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you, you make a profit, don't you?

MR. WISE: Not necessarily. We don't need to discuss economics with this witness. I think the answers are what you want.

MR. SELTZER: Would you answer the question, please.

MR. WISE: No.

Why don't you restate the question. I would suggest, Mr. Seltzer, that we not drop to a level that is just tedious.

MR. SELTZER: I'm sorry if I am boring you, Mr. Wise.

MR. WISE: It is not boring me, it is just that I think you are badgering the witness asking him to define what is a profitable business. He told you this was a growth opportunity for the company and they wanted to sell more.

Simply pursuing and hounding him about how one makes a profit in the business world I think is not productive but if you want to continue with that line of questioning, go ahead.

MR. SELTZER: Could you read what the

question was before Mr. Wise objected,
please.

(The reporter read back the record
as follows: "Question: If you sell for
more than it costs you, you make a profit,
don't you?")

A Yes.

Q Under your stewardship from 1972
through the accident at Three Mile Island, did
B&W's annual sales of training services increase?

A Yes.

Q Under your stewardship from September
1972 through the Three Mile Island accident, did
B&W's profits from selling training services
increase annually?

MR. WISE: Could we establish
whether or not B&W keeps records of the type
that would show that information before the
witness attempts to give an answer?

Q Would you answer Mr. Wise's question.
Did B&W keep records that would show the
profitability of the Training Department?

A To the best of my recollection, I do not
know where those records are that would describe

profit derived from the training services business.

Q I am not concerned with where they are maintained. It's a fact, isn't it, that each year that you have been responsible for training services, you have seen calculations of the costs of performing training services? Haven't you?

MR. WISE: Do you mean the costs of just the Training Department or are you going to include the overhead and the other costs that may be associated with the Training Department?

I think the problem with your question, Mr. Seltzer, is that you are asking for conclusions as to financial matters that we haven't established this witness is --

MR. SELTZER: I am happy to establish it.

MR. WISE: -- is competent to testify to. I don't know what Mr. Elliott's background is and what kind of reports he may receive and I am a bit reluctant to have this line of questioning go on before we find out what we mean when we talk about cost

2 or profit or some of these other terms
3 that you have used. I don't know how B&W
4 keeps its internal accounting system and to
5 what extent he may be able to answer those
6 things. It may be that you want another
7 witness with respect to those types of
8 questions. I don't know. He may be able to
9 answer them. I don't know.

10 Q Are you the person at B&W who is
11 principally responsible for Training Services?

12 A Yes.

13 Q You prepare every year, do you not, a
14 business plan for Training Services?

15 A Yes.

16 Q You receive reports that show the
17 costs of running the Training Services Department,
18 do you not?

19 A I receive reports that are related to direct
20 costs. There are a large number of other costs
21 associated with the business of general and
22 administrative expenses and other transfer costs
23 that are associated with the operation of the
24 total business which is the only entity for
25 which profit and loss is accumulated, and I only

1
2 get a portion of the costs.

3 Q In the costs which you see reported, are
4 the salaries paid to you and the people who report
5 to you indicated as a cost of the Training Services
6 Department?

7 A The salaries of the people who report to me
8 are recorded. My salary is not.

9 Q Are the costs of maintaining the
10 simulator cost that is reported to you a cost
11 of your department?

12 A Yes.

13 MR. WISE: You mean the direct cost
14 of maintaining the simulator, not necessarily
15 the building in which it sits and the land
16 on which the building sits? We can get into
17 financial questions that can go on and on.

18 Q Do you get reports that show the
19 reference "Use generated by B&W from the sale of
20 Training Services"?

21 A I receive reports of revenue generated,
22 though that revenue may not be the complete revenue.

23 Q How frequently do you receive reports
24 that show the revenue received by B&W for Training
25 Services?

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2

A Monthly.

3

Q What is that report called?

4

A I don't know, sir.

5

Q Does it have a title?

6

A I don't know.

7

Q Does it have a number?

8

A No. It's not a computer-generated report.

9

Q If you were asking your secretary to get you the most recent such report, how would you describe it to her?

12

A I would tell her that, "Please get me the monthly sales report for the financial and accounting for Training Services.

15

Q Do you get any annual report on the financial operations of the Training Department for training services?

18

A Yes. It's the end-of-the-year report that is -- the end-of-the-year monthly report.

20

Q Do the monthly reports have year-to-date results?

21

22

A Yes.

23

Q So you are saying that the December report would give you an annual total?

24

25

A Yes. If December is the end of the fiscal year.

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Q What is the fiscal year?

3

A We have changed fiscal years in recent times, and our current fiscal year ends the 31st of March.

5

6

Q Does the monthly sales report show any of the costs associated with the delivery of training services?

7

8

9

A It shows some of the costs, yes.

10

Q Does the monthly sales report show any difference between the revenues generated and the costs incurred?

11

12

13

A It shows the difference between the revenues generated and the direct costs.

14

15

Q What is the difference called?

16

A In the B&W accounting system, it's called gross margin.

17

18

Q For how long have you been receiving these monthly reports?

19

20

A I have been receiving them for a very long time. I cannot tell you exactly.

21

22

Q It's correct, is it not, that the annual gross margin achieved by the Training Services Department at B&W has been increased under your stewardship from 1972 through the date of

23

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Three-Mile Island accident?

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A Yes.

4

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Q Would it be fair to say that the gross margin has grown substantially?

6

MR. WISE: What is "substantially"?

7

MR. SELTZER: More than 500 percent.

8

A I can't answer that.

9

Q You don't know?

10

A I do not know at this time, no.

11

12

Q Is it correct that you prepare annually a business plan or business projection for the Training Services Department?

13

14

A Yes.

15

16

Q Is Training Services a department? I am using the correct nomenclature?

17

A No, you are not using the correct nomenclature.

18

Q What is it?

19

20

A When I first came to B&W, it was a unit, and now it's currently classified as a section.

21

22

Q When did it become transformed from a unit to a section?

23

A Approximately 1974 or '5.

24

25

Q Was that change in designation reflecting any change in the organization of

1
2 Training Services?

3 A No.

4 Q In the annual business plan that you
5 prepare, do you project the future business of
6 the Training Services Unit or Section?

7 A Yes.

8 Q Do you project what the revenues will
9 be?

10 A Yes.

11 Q Do you project what the direct costs
12 will be?

13 A Yes.

14 Q I take it that you are therefore
15 projecting the gross margin of your unit or section,
16 right?

17 A Yes.

18 Q To whom do you send the annual business
19 plan?

20 A That is included in the department business
21 plan.

22 Q What department?

23 A The Training Services currently is included
24 in the Customer Services Department, and that
25 department was previously designated as the Nuclear

1
2 Services Department.

3 Q How frequently do you prepare a
4 business plan?

5 A Annually.

6 Q Have you been doing that since 1972?

7 A I suspect I started doing that in '73.

8 Q Do you ever receive your business plan
9 or drafts of your business plan back with
10 requests for modifications?

11 A I don't remember any.

12 Q Do you ever get any comments from
13 management above you on the contents of your
14 business plan?

15 A Yes.

16 Q Do you get those comments in writing?
17 Have you ever gotten such comments in writing?

18 A Not that I remember.

19 Q Is there a meeting at which you present
20 your business plan to management above you?

21 A In the recent years, yes.

22 Q Who attends those presentations?
23 Starting with the highest-ranking individual.

24 A Mr. Seltzer, would you discuss the time frame
25 in which you wish to have this question answered?

1
2 We have had progressive changes over significant
3 periods of time, and I would like to answer it in
4 the time frame if you would like to have your
5 information.

6 Q Has it generally been the rules that
7 the head of NPGD has attended your presentation?

8 A No.

9 Q Has the head of NPGD ever attended your
10 presentation?

11 A No.

12 Q Who is the highest-ranking individual at
13 B&W who has ever attended a presentation on the
14 business plan for Training Services?

15 A I believe my Department Manager.

16 Q So to the best of your recollection,
17 the meetings at which you have presented the
18 Training Services business plan have never
19 been attended by anybody higher than the head of
20 the Nuclear Services Department or Customer
21 Services Department?

22 A That's as I recollect.

23 Q Have the Managers of the other units
24 or sections in the Nuclear Services Department
25 or Customer Services Department, as it is now

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called, generally attended your presentation?

A Yes.

Q Have you also attended their presentations?

A Yes.

Q Have there ever been discussions at any of these meetings regarding whether Training Services is achieving a sufficient gross profit margin?

A I don't remember any such discussion.

Q Has there ever been any discussion over whether the percentage of gross profit achieved by the Training Services is adequate?

A I don't know that there was a discussion.

Q Who sets the prices for training services?

A The prices are set by the Marketing Department which has responsibility for price.

Q During the year immediately preceding the Three Mile Island accident, was there a mark-up over costs, direct costs which Training Services generally tried to achieve?

A Yes, as contained in the business plan.

Q What was that mark-up?

A I don't remember.

1
2 Q Do I understand you correctly that
3 on each of the training programs which the
4 Training Services Unit sold, it was your objective
5 to achieve the mark-up that was specified generally
6 in the business plan?

7 MR. WISE: Whose objective, Mr. Elliott's
8 or B&W's generally?

9 MR. SELTZER: Mr. Elliott's in propounding
10 the business plan.

11 MR. WISE: I'm sorry, could I have the
12 question repeated?

13 MR. SELTZER: I will rephrase it.

14 Q Mr. Elliott, in propounding the business
15 plan, do I understand you correctly that there was
16 a percentage gross profit margin which you believed
17 was the target for the Training Services Unit?

18 A Derived from the numbers that are in the
19 Comprehensive Business Plan, there would
20 have been a percentage of gross margin.

21 Q Is "Comprehensive Business Plan" the
22 name of your annual business projection?

23 A Yes.

24 Q When new Training Services packages
25 were proposed, was there an attempt to price

1
2 them in order to achieve the gross profit
3 percentage that was your overall percentage
4 in the Comprehensive Business Plan?

5 A No.

6 Q How were prices derived, if you know,
7 for new Training Services programs prior to the
8 Three-Mile Island accident?

9 A New training programs were priced based on the
10 expected labor content to do that course and costs
11 for facilities as stated in the cost price sheets
12 based on estimated labor and facilities used.

13 Q In addition to recovering the cost
14 of labor and facilities, did the price for the
15 training services also include a return for B&W?

16 A I'm sorry, I can't answer that. It's related
17 to the previous question about the overhead costs.

18 Q You said that the price for new services
19 was based on the labor costs and on the facilities
20 costs, is that right?

21 A That's right.

22 MR. WISE: As established in the
23 price sheets. I don't think we have established
24 how those particular charges were derived
25 and whether those charges include overhead,

1
2 mark-up and the other things that you appear
3 to be interested in. I'm sure.

4 MR. SELTZER: Oh, come on, don't get
5 cute.

6 Q When you say that prices were based on
7 labor costs, are those the actual salaries
8 paid or does it include more than just the
9 salaries paid for labor?

10 A The company has price sheets for the
11 retail price of services on an hourly basis.

12 Q Do you know whether the price sheet charges
13 for an hour of labor results in billing customers
14 for more than just the salary of the person working
15 for an hour?

16 A Yes.

17 Q Do the prices charge more than the
18 salary to the person working an hour?

19 A Yes.

20 Q Similarly, for costs of facilities,
21 do the prices for use of facilities include
22 more than B&W's direct cost imbedded in those
23 facilities?

24 A Yes.

25 Q Do you have in one file the price

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sheets that you are referring to?

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A They are generally available at the company,

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yes.

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Q If you wanted to have those brought to

6

you, how would you describe them?

7

A The sheet I believe you are talking to

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is called a master services rate sheet.

9

Q It's a fact, isn't it, that during

10

the time you have been the Manager of Training Services,

11

B&W has decided not to offer certain training

12

programs or has canceled certain training programs

13

because they were not sufficiently profitable,

14

isn't that right?

15

A I don't remember any.

16

Q Without asking you to remember a

17

specific program, isn't it a fact that there

18

have been programs that have been dropped or not

19

offered because B&W did not believe they would be

20

sufficiently profitable?

21

A I don't remember any.

22

Q Does the Marketing Department confer

23

with you on what prices will be charged for training

24

services?

25

A Yes.

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Q Whom do you talk within the Marketing Department?

A Over the years I have talked to a number of people.

Do you wish all their names?

Q Beginning with the man you currently talk to and working back.

A Currently it's Mr. Maybery.

Q When did Maybery become the man that you spoke to about the pricing of training services?

A Approximately a year ago.

Q Prior to Maybery, who in Marketing conferred with you on the pricing of training services?

A Mr. Hicks.

Q For how long was Hicks the man that you spoke with in Marketing?

A I would say about three years.

Q Is George Stoll still with B&W?

A No.

Q For how long after September 1972 did he continue to work in the Training Department?

A My recollection is about a year.

1

2

Q Where did he go after that?

3

A He was assigned to the Personnel Department.

4

Q How long did he stay there?

5

A Up until -- I believe last year when he retired.

6

7

Q Did you believe that George Stoll had been doing a good job in running Training Services prior to your arrival?

8

A Mr. Stoll had been doing an adequate job.

9

Q Not as good as you felt should be done, is that right?

10

A That's correct.

11

Q Other than a Comprehensive Business Plan, what other reports do you prepare on a periodic basis?

12

A Monthly reports.

13

Q For how long have you been preparing monthly reports?

14

A More or less from the continuous time I have been at B&W.

15

Q Do all of the units or sections that are part of the Customer Services Department prepare monthly reports?

16

A Yes.

1

2

Q Do you prepare any other reports
on a periodic basis, and if so, what are they?

3

4

A I don't -- I don't recollect developing any
other periodic reports.

5

6

Q You used the verb "develop."

7

Do you write any other periodic reports?

8

A I don't know of any, no.

9

10

Q Do you receive any periodic reports
from people below you?

11

A Not in writing.

12

13

Q In other words, you don't get any
daily, weekly, or monthly reports from anybody who
reports to you?

14

15

A Not written reports.

16

17

Q What types of reports in writing
do you get on a non-periodic basis from people
who are part of the Training Services Department?

18

19

A Those are primarily trip reports.

20

21

Q Trips to operating utilities
primarily?

22

A Yes.

23

24

Q What other type of trip reports?

25

A It might be a trip to a training class that
they have gone to, a seminar, other business-related

2 travels.

3 Q What other reports do you get from
4 people who are part of the Training Services Unit?

5 A I get no other written reports.

6 Q Do you get nothing in writing that
7 records who is attending training sessions?

8 A I do not receive those reports directly.

9 Q I didn't say directly.

10 A I do not receive the reports. They are
11 not written for my purpose.

12 Q Do you get any reports in writing
13 on the content of the training programs being
14 given by people who are subordinate to you?

15 A People who are subordinate to me do not
16 write me directly and say what the content of the
17 course is.

18 Q Do they write to anybody saying what
19 the content of the course is, anybody at B&W?

20 A There are schedules and outlines of instruc-
21 tions given that are prepared provided to the
22 students attending the course. They are published
23 on the boards. They are provided to each of the
24 instructors who will participate.

25 Q "They are published on the boards," is

1
2 that what you said?

3 A Yes.

4 Q Is that short for bulletin boards?

5 A That is short for bulletin boards.

6 Q When you say you don't receive any
7 reports directly, do you receive any reports
8 indirectly?

9 A I receive verbal reports.

10 Q By "verbal," you mean oral?

11 A Oral, yes, oral.

12 Q But do you get anything in writing
13 indirectly, are you copied on things, do others
14 in the Training Section pass things along to you that
15 they have received from people working in the
16 Training Section?

17 A Yes.

18 Q What types of writings are those?

19 A They are in many cases the critiques that
20 the students write about the courses that they are
21 taking.

22 At the end of each course, there is an
23 effort made to have each student evaluate the
24 training program, instructors, content of the
25 program, fidelity of our simulation equipment,

1
2 and those are an individual comment by the
3 student; they are collected by the instructor
4 in charge of that particular course, and routed
5 to the other members of the training staff for
6 information, and included in the files of that
7 training course.

8 Q For how long has it been B&W's
9 practice to collect such critiques?

10 A As long as I have been there.

11 Q For how long are those critiques
12 maintained in the files?

13 A I believe the files are essentially complete
14 back into 1971.

15 Q Do you get any reports directly or
16 indirectly in writing that reflect the performance
17 of students in the training courses?

18 A We conduct certain examinations to determine
19 the student's -- an understanding of a limited
20 scope, and those -- those examination results are
21 prepared by B&W, based on their examination,
22 both oral and written.

23 Q Do you receive copies of those
24 written reports, either directly or indirectly?

25 A I do not normally receive a copy. I may sign

2 the letter that sends that to the utility.

3 Q When B&W sends reports to the
4 utilities on the performance of their operators
5 in the B&W training program, does B&W keep
6 a copy of those reports?

7 A Yes.

8 Q In the venacular that you apply to the
9 tests that are given, is it possible for an operator
10 to fail the tests given by B&W?

11 A Yes.

12 Q What does it mean for an operator to
13 fail?

14 A The operator did not meet the criteria set
15 out for that particular test.

16 Q Do operators from time to time fail
17 B&W's tests?

18 A Yes.

19 Q Would your records indicate why
20 an operator had failed?

21 A Yes.

22 Q Are your files maintained in such a
23 way that it would be easy to locate the test
24 results for the operators sent by a particular
25 utility?

MR. WISE: What is the definition of

"easy"?

Q If you said to somebody in your department "I want to see the test results on the SMUD operators for the last three years, would somebody be able to go and find that readily?

A Yes, it is possible to find that.

Q And find readily?

A It takes significant amounts of work to get them, but they are there.

Q Are they in files labeled "Test Results" or something like that?

A No.

Q What would the designation be on the file?

A It would be in contract files.

Q Who makes the determination whether B&W will issue a certificate for an operator's having successfully passed B&W's training program?

A The person actually evaluating the results of the tests is a joint effort between the examiners and the individual who is in charge of the training and in past times called the Lead Instructor.

Q What is he called now?

A We don't have a Lead Instructor at the moment.

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We have a Unit Manager who manages that group of work.

Q Who is the Unit Manager?

A Mr. Odell.

Q Is John Lind still with you?

A John Lind is still employed by The Babcock & Wilcox Company.

Q In what capacity?

A He is an Engineer assigned to the startup of the Midland Nuclear Station.

Q Did you recommend that he be transferred out of Training?

A Yes, I recommended that he be considered for this position. Mr. Lind had felt he wished to broaden his experience and do something other than training.

Q Was there any respect in which you believed that Mr. Lind's performance in the Training Services Unit was not satisfactory?

A Mr. Lind's performance was very satisfactory.

Q Did you have any reservations about his performance?

A No.

Q Who was Mr. Lind's predecessor as

1
2 Lead Instructor?

3 A Mr. Perks.

4 Q For how long was Perks Lead
5 Instructor?

6 A Approximately a year.

7 Q Who was Perks' predecessor as Lead
8 Instructor?

9 A Mr. Street.

10 Q How long was Street the Lead Instructor?

11 A Approximately two years.

12 Q When Parks took over as Lead Instructor,
13 did Street leave B&W?

14 A No.

15 Q Has he since left B&W?

16 A No.

17 Q When Lind took over, did Parks leave
18 B&W?

19 A Yes. The man's name is Perks.

20 Q Before Perks decided to leave B&W,
21 had you decided to replace him as Lead Instructor?

22 A No.

23 Q Why did he leave?

24 MR. WISE: To the extent that Mr. Elliott
25 can answer that question, I will permit him to

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2

do so.

3

MR. SELTZER: All right.

4

5

Q If you can't answer it, I wouldn't want you to answer if.

6

Why, if you know, did Perks leave B&W?

7

8

9

A He believed he had an opportunity for a position with another company that he would like very much to have.

10

11

Q How did you first learn about this lawsuit?

12

13

A I believe I was advised by the company's attorneys.

14

15

Q Orally or in writing?

A Initially I believe orally.

16

17

Q What do you understand this lawsuit is all about?

18

19

20

MR. WISE: I am going to object to that unless you can focus your question a little bit better. That is an extremely --

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Q Do you know --

MR. WISE: Mr. Seltzer --

MR. SELTZER: I will withdraw it.

Q Do you know who is suing whom in this lawsuit?

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A I think I do.

Q What is your understanding of the
essence of GPU's and its operating subsidiaries'
claims against B&W?

MR. WISE: I object to that question and
direct him not to answer.

Q Have you read the complaint in this case?

A Yes.

Q Did you understand it?

A At the time I read it, it appeared reasonably
clear.

Q Have you read B&W's answer?

A Yes.

Q Has anybody spoken to you about
gathering documents from the Training Services
Unit for production in this lawsuit?

A Yes.

Q Who spoke to you about that?

A The company's attorneys.

Q Did they ask you to turn over files
which you maintain?

A Yes.

Q Did you do that?

A Yes.

1
2 Q Did you personally go through files in your
3 office and adjacent to your office to determine what
4 correspondence or other documents should be turned
5 over?

6 A I personally went through certain of my
7 files and the remainder of the files were searched
8 by an employee.

9 Q Who?

10 A Mrs. Saunders.

11 Q What is her title?

12 A She is currently the Training Services
13 Administrative Aid.

14 Q Did you give instructions to anybody
15 working in your sections regarding their producing
16 any of their documents?

17 A Other than Mrs. Sanders, I don't remember
18 anybody.

19 Q What did you tell her?

20 A To compile the documents as requested by the
21 attorneys.

22 Q Since the start of this lawsuit, have
23 you announced any policy to people working in the
24 Training Services Section regarding retention of
25 files?

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2

A I don't remember doing that.

3

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Q Do you know if anybody else has issued any directives to people in Training Services regarding retention of files since the start of this lawsuit?

7

8

A I think I remember a memorandum prepared by the attorneys relative to retention of records.

9

10

Q Where do you keep the files which you refer to as Manager of Training Services?

11

12

13

14

A I have two sets of files, one of which is the contract files that are maintained by Mrs. Sanders in a file cabinet in our offices and they include all correspondence to active customers.

15

16

I have a miscellaneous file of subjects in my desk.

17

18

19

Q Is there one individual who is principally responsible for the operation of the B&W simulator?

20

A No.

21

22

Q Who are the people who are responsible for the operation of the B&W simulator?

23

24

25

A The B&W simulator is operated for the purpose of training individuals by the members of the training staff who are employees in the section

1
2 after they are qualified to run the controls and
3 are knowledgeable in the evolutions.

4 Q Is it your testimony that there is no
5 one person or group of people who are principally
6 responsible for the operation of a simulator?

7 A The use of the simulator is generally done by
8 the people who are currently assigned to the unit
9 identified as Instructional Services. That group
10 previously had been headed by a Lead Instructor.
11 Those people operate the simulator.

12 To the extent that somebody is in charge
13 of the use of the simulator as a training device,
14 that is -- that is now the Manager of Instructional
15 Services, and was previously the Lead Instructor.

16 Q Is the Manager of Instructional Services
17 somebody who performs the same functions as the
18 Lead Instructor, used to?

19 A Yes, that individual performs generally the
20 same responsibilities.

21 Q Does he perform any additional
22 responsibilities?

23 A No, I do not think he does any additional.
24 He may do a few less.

25 Q What does he not do that the Lead

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2

Instructor used to do?

3

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A Previously the training staff was somewhat smaller, and the Lead Instructor did perform some of the instruction in the classroom and in the simulator whereas the Manager now does not.

7

8

Q Who is responsible for programming the simulator?

9

10

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A We have two members of the Training Services staff whose function is to work on the modeling, that is, the mathematical modeling of the program in the simulator, and there are two members of the Computer Services staff who actually implement the modeling equations into language for the computer.

15

16

Q Who is responsible for the programming of the simulator?

17

18

A The principal engineer in charge of the -- correction.

19

20

The programming of the simulator computer is under the direction of Mr. Jack Brown.

21

22

Q Does Jack Brown have a title?

A I am not sure of Mr. Brown's title.

23

24

Q Is he a computer programmer?

25

A Yes.

Q And you say there is another individual

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who assists Brown in programming the simulator?

A Mr. Brown assists another individual by actually programming the machine. The most difficult part of the problem is to write the equations that must be then programmed.

Q Is Brown the one who gives the instructions on what the programmers should be modeling in programming?

A No.

Q Who does that?

A Mr. Rosser.

Q What is Mr. Rosser's position?

A He is -- he has a title of Principal Engineer, and he is the modeling engineer for the simulator.

Q Rosser tells Brown what to be programmed into the simulator, is that right?

A Yes. He makes that information known by equations.

Q For how long has Rosser had that responsibility?

A Working directly in Training Services since 1976, and he was previously involved in the simulator's procurement in '66 and '67. Check

1

2

the record, please?

3

What were the dates I gave you

4

for Mr. Rosser's employment in the modeling task?

5

MR. WISE: Could the reporter please read

6

back the last answer?

7

(Record read by the reporter.)

8

THE WITNESS: Thank you.

9

Q Are those dates correct?

10

A Those dates are correct.

11

MR. SELTZER: Off the record.

12

(Discussion off the record.)

13

(Recess taken.)

14

MR. SELTZER: I would like to have

15

marked for identification as GPU Exhibit 42

16

a series of two letters from Paul Collins

17

of the AEC to Mr. Elliott, the first

18

dated November 15, 1972 and the second dated

19

March 19, 1973.

20

MR. WISE: Off the record.

21

(Discussion off the record.)

22

MR. SELTZER: I will re-identify

23

the exhibits.

24

I would like to have marked as GPU

25

Exhibit 42 a letter from Mr. Paul Collins

of the AEC dated December 15, 1972.

I would like to mark as GPU Exhibit 42 a letter from Collins to Elliott dated March 19, 1973.

MR. WISE: I believe you mean GPU 43 for the March 19 letter.

MR. SELTZER: Right.

(Letter from Paul Collins to Norman Elliott dated December 15, 1972 marked GPU Exhibit No. 42 for identification as of this date.)

(Letter from Paul Collins to Norman Elliott dated March 19, 1973 marked GPU Exhibit No. 43 for identification as of this date.)

MR. SELTZER: I will also ask to have marked as GPU Exhibit 44 for identification a letter from Collins to Elliott dated May 3, 1977.

(Letter from Paul Collins to Norman Elliott dated May 3, 1977 marked GPU Exhibit No. 44 for identification as of this date.)

MR. SELTZER: I have reviewed with Mr. Wise the stamp which appears on the bottom of the first page of GPU Exhibit 42, and

1
2 he has indicated that he will -- do you want to
3 state that?

4 MR. WISE: Yes. I will say on behalf
5 of B&W we withdraw any claim of "Confidential,
6 Counsel Only," that may have been made with
7 respect to Exhibits 42, 43, and 44.

8 MR. SELTZER: Thank you.

9 (Documents handed to the witness.)

10 A I have looked over this resume, and I overlooked
11 a change in the address. I do not live as reported
12 on the resume, Exhibit 41. That address should be
13 changed to 103 Loch Terrace, Lynchburg, Virginia,
14 24503, P.O. Box 3113 for mailing purposes.

15 Q Thank you.

16 Are GPU Exhibits 42, 43, and 44 copies
17 of letters which you received from the AEC shortly
18 after the dates that are stamped on the top of each
19 of those letters?

20 A To the best of my recollection.

21 Q Is it correct that the AEC and subsequently
22 the NRC reviews the B&W training programs?

23 A Yes.

24 Q Do they advise you whether those training
25 programs comply with their regulations?

2 A Such advice is provided in letters such as
3 these.

4 Q Have you ever been advised that a B&W
5 training program did not comply with an AEC or NRC
6 regulation?

7 A In the development of a training program, I have
8 been advised that they wish something different in
9 that program. Such changes were made.

10 Q Has that happened more than once?

11 A Only once to my memory.

12 Q Which training program was that?

13 A It's a program called Start-Up Certification.

14 Q When was that program developed?

15 A It was most likely that it was 1975.

16 Q When did B&W begin qualifying operators
17 for cold licensing on the B&W simulator?

18 A B&W never qualified operators for cold license.

19 Q When did B&W begin giving operators
20 training on its simulator so that they could qualify
21 for a cold license?

22 A I believe that was in 1971.

23 (Continued on next page.)

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Q Did there come a time after GPU

Exhibit 42 was sent to you that operators could
qualify for a cold license without any hands-on
experience on a hot reactor?

MR. WISE: I am not sure, Mr. Seltzer,
that I understand your question and I am not
sure the witness does.

Are you asking him now whether the
NRC ever licensed anybody without any regard
to whether or not those people were in any
way connected with B&W's training programs
in the manner you have described? Or are you
referring him now to some specific program
that B&W was offering?

MR. SELTZER: I am looking at GPU
Exhibit 42 which refers to a program that
B&W had in operation from 1968 through 1972.

Q Do you see the reference to that in
the second paragraph?

A Yes.

Q Under that training program which
involved using a simulator, an operator could not
obtain a cold license without also having experience
at an operating PWR; isn't that right?

1
2 MR. WISE: You are asking the witness
3 for his knowledge which he may have gained
4 after he came to B&W with respect to a
5 period of time prior to his employment at
6 B&W?

7 MR. SELTZER: Right.

8 MR. WISE: To the extent, Mr. Elliott,
9 that you have gained knowledge through
10 something somebody has told you after you
11 came, you may answer the question just as
12 long as we all recognize the source of the
13 testimony.

14 MR. SELTZER: I wouldn't exclude
15 using the next sentence in the document which
16 is the first sentence of the third paragraph,
17 "One of the criterion for accepting your
18 program was that the applicants complete a
19 four-month assignment at an operating PWR."

20 MR. WISE: If that is sufficient to
21 help Mr. Elliott interpret this letter, that
22 is fine. I don't know whether it is or not.

23 A This letter is the -- is an NRC letter to
24 B&W that requests B&W to do -- to report its program
25 to them.

Elliott

1
2 The criterion for acceptance of
3 candidates for "cold license" by the Nuclear
4 Regulatory Commission is their province and really
5 each of the major suppliers, Westinghouse, General
6 Electric, Combustion Engineering and B&W, have
7 programs to assist the utilities in allowing them
8 to qualify their employees and prospective
9 operational personnel for licensing by the Nuclear
10 Regulatory Commission.

11 MR. SELTZER: I move to strike that
12 as not being responsive.

13 Q I am asking you, isn't it your
14 understanding that prior to your receipt of GPU
15 Exhibit 42, operators who were being trained on
16 the B&W simulator also had to have four months of
17 work at an operating PWR in order to receive a cold
18 license?

19 MR. WISE: The question, Mr. Elliott,
20 is whether you, through whatever sources,
21 know whether that is a factor or not as to
22 what the NRC required during the period 1968
23 through 1972.

24 A From my dealings with the Nuclear Regulatory
25 Commission, they required experience at a nuclear

power plant by prospective operational personnel.

Q Is it a fact that after you received GPU Exhibit 42 and had further responded to certain questions from the AEC, B&W was able to provide sufficient training on its simulator and in conjunction with its simulator so that operators could obtain a cold license without actually being assigned to an operating PWR?

A No, sir, that is not true.

Q Did there ever come a point in time when operators could qualify for cold licensing without working at an operating PWR?

A Not to my knowledge.

Q If a utility was starting up a new nuclear unit and was going to be the first nuclear unit that that utility owned, is there any way that an operator could get a cold license without working at an operating nuclear plant?

A Not to my knowledge of the way in which the Nuclear Regulatory Commission and previously, the AEC, operated.

Q To your knowledge, how would operators for a nuclear plant such as the one I have just described get experience at an operating nuclear

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plant?

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A They were -- operators would get experience in operating a nuclear power plant by having their employing utility make arrangements with a utility-- with an operating nuclear plant for these individuals to come and integrate with the operational staff of that nuclear power plant for some period of time.

Q Would they just be observers in the control room?

A The practical application of that is that is true that the minimum requirement was to be an observer.

Q Would they be permitted under NRC or AEC regulations to touch the controls if they didn't have an operating license?

A Individuals are allowed to manipulate the controls of nuclear power plants as long as they are under the direct supervision of a licensed operator for that facility which they are operating and that it was with the permission of the owning and responsible utility.

Q On page 2 of GPU Exhibit 42, in the second sentence, Collins says to you, "In order

1
2 to assist us in our review of your training programs,
3 please provide us with the following information
4 regarding the B&W NPPS."

5 Am I correct that those initials
6 stand for nuclear power plant simulator?

7 A Yes.

8 Q Do you know whether a letter was
9 subsequently sent to the AEC providing the
10 information requested?

11 A I believe such letter was sent.

12 Q Do you have a file for correspondence
13 with the NRC or the AEC?

14 A Yes.

15 Q Where is that file?

16 A It's my understanding it's been given to
17 the company's attorneys.

18 Q Is there one file for the Training
19 Services Unit that contains all correspondence with
20 the NRC?

21 A Yes.

22 Q Would you look at item No. 4 on page 2
23 of GPU Exhibit 42. In that paragraph, Paul Collins
24 asked you to provide information with respect to
25 your simulator regarding "the means you plan to

1
2 employ to assure fidelity of each simulated system
3 when data is available from operating B&W designed
4 facilities."

5 What did you understand Collins
6 meant when he referred to data from operating B&W
7 designed facilities?

8 A I can only answer that in that how we
9 responded to that request. I can't say what
10 Mr. Collins implied.

11 Q If I didn't speak clearly, I meant
12 what did you understand it meant?

13 A Our response to this letter was we provided
14 the Atomic Energy Commission, Mr. Collins' office,
15 with a description of the checks and modifications
16 that we planned to make to the simulator after a
17 facility was operating in which case we had data
18 that would substantiate how the plant actually
19 worked other than the design numbers on which
20 the simulator was based.

21 Q When you say the way in which the
22 plant would actually work, do you mean that you
23 would compare how key parameters in the plant
24 responded to a transient as contrasted with how
25 the simulator had been programmed to depict that

2 transient?

3 A We, in the simulation business, do not
4 simulate transients.

5 We make a mathematical model that
6 represents the process that is taking place
7 to the best of the ability to write those
8 equations and solve them in the computing system,
9 and those equations coupled together will follow
10 the static and dynamic behaviour of a power plant.

11 And we would change those equations
12 and the constants in those equations to match
13 the data that was available from various plants
14 and in response to this particular letter,
15 I believe we said we would use the data from the
16 first B&W type nuclear plant.

17 Q Is that the SMUD reactor?

18 A That was not the SMUD reactor.

19 Q Which one was that?

20 A That was the Oconee nuclear station, Unit 1.

21 Q Who owns Oconee?

22 A Duke Power Company.

23 Q Who was assigned, if anyone, to
24 verify the simulator was programmed in a way that
25 would have fidelity to the actual operation of

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Oconee?

3

A Mr. Rosser.

4

Q Why did you pick Oconee as the plant

5

that you would compare the simulation to?

6

A That was the first opportunity that B&W would

7

have at this time to gain information on the

8

operation of its peculiar type nuclear steam supply

9

system. The nuclear steam supply systems for the

10

early generation of nuclear plants were essentially

11

the same for a great number of the components.

12

Q Was SMUD an earlier type plant?

13

A No. It was of the same type.

14

Q The control panels in the B&W simulator

15

are most closely modeled after the control room

16

in SMUD, isn't that right?

17

A That's correct.

18

Q After comparing the manner in which

19

the B&W simulator was programmed with the actual

20

operating data from Oconee, did B&W make any

21

changes in the equations in the simulator?

22

A Yes.

23

Q Has B&W subsequently reviewed operating

24

data from other plants in order to assure the

25

fidelity of what is being simulated?

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A Yes.

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Q Prior to the Three Mile Island accident, what other plant's operating data was used in adjusting the simulator?

6

7

8

A Primarily the data from Rancho Seco that is owned by Sacramento Utility District. That's the title for SMUD.

9

10

Q Is Rancho Seco the same as the SMUD plant?

11

A Yes.

12

Q They are one and the same?

13

A They are one and the same.

14

15

Q Were any other plants used in tuning up the simulator?

16

17

18

A Since the initial modifications we have restricted ourselves to data from the Rancho Seco plant.

19

20

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22

Q If you wanted to find your response to Collins' letter, which is GPU Exhibit 42, would you go to the AEC correspondence file that you said you turned over in this case?

23

A Yes.

24

25

Q If you were going to pick one B&W plant which the simulator most closely models, do I

1
2 understand correctly that that would be the SMUD
3 Rancho Seco plant?

4 A Yes.

5 Q Is it correct that the B&W simulator
6 more closely models the Rancho Seco unit than either
7 of the Three Mile Island Units?

8 A Yes.

9 Q That was true before the Three Mile
10 Island accident?

11 A Yes.

12 Q And it is still true today?

13 A Yes.

14 Q Is Rancho Seco a type 177 plant?

15 A Yes.

16 Q What types of operating responses
17 would be different between Rancho Seco and TMI-2?

18 MR. WISE: That's an extremely
19 broad question. You can attempt to tackle
20 it in as broad a fashion as you think you
21 need to unless Mr. Seltzer wishes to narrow
22 the question.

23 A Please understand that my answer is somewhat
24 general. The places where the systems are alike
25 is the steam generators, reactor coolant pump flow.

1

2

Q What was the last thing?

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A Reactor coolant pump and primary flow, the reactor itself, the reactor vessel, the reactor head, the reactor rod control system, the integrated control system, which was the plant control system. The places that it is different are primarily in the area of those systems, equipment, and components supplied by the architect engineers and constructors of Three Mile Island Unit 2, and those were at the discretion of the owner.

13

14

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16

Q What, if any, are the principal

differences between the performance of the B&W-supplied NSS in SMUD and the B&W-supplied NSS in Three Mile Island Unit 2?

17

18

A That portion of it has essentially similar response.

19

20

Q Are you saying that you know of

no significant difference in response?

21

22

A I don't know of any at the moment, that is correct.

23

24

25

Q Looking at the paragraph that appears just below the paragraph numbered 5, Collins said to you, "If it is your intention to

1
2 use a nuclear power plant other than SMUD for the
3 observation portion of the training programs,
4 please include a listing of the differences
5 between the NPPS and that plant."

6 Was it your intention to use any
7 nuclear power plant other than SMUD for the
8 observation portion of the training programs?

9 A I do not at this moment recall the
10 response to this, which is contained in the
11 letter in the files we talked about.

12 The plant used for this observation
13 training was a function of the desires of the
14 utility, and I would suspect that this answer
15 said that we would tell them later or negotiate
16 what the differences were and whether those
17 differences were acceptable.

18 Q Was the plant where the observing
19 would be done the Oconee plant?

20 A We might have said that Oconee was an
21 acceptable place to do that. I cannot answer
22 specifically.

23 Q Did you send the response to Collins?

24 A Yes.

25 Q Do you keep a chronological file?

1

2 A Yes.

3 Q In addition to putting a copy of
4 of your response to Collins in the AEC file,
5 would you have kept a copy in your chronological
6 file?

7 A Yes.

8 Q We were unable to find it in your
9 chronological file. Maybe I will bring it in
10 here and ask you if you can find it.

11 Can you suggest any reason why it
12 wouldn't be in your chronological file?

13 A I know of no reason why it's not there.

14 Q Would you take a look at GPU Exhibit 44,
15 please.

16 Is the substance of GPU Exhibit 44 that
17 the NRC is advising you that the B&W training
18 program which you are going to be giving will be
19 satisfactory for establishing cold license
20 eligibility?

21 A That's my understanding.

22 Q To whom does Rosser report?

23 A Myself.

24 Q Who gives Rosser instructions on
25 what he should program the simulator for?

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A In broad direction it has been done by myself and by the Lead Instructor and the -- and currently the Instructional Manager. We developed the changes and the improvements that we think should be made through our observation of performance of the machine and it may be a specific developed by an instructor, it might be prompted by a student who conveys that idea to an instructor who is operating the machine and will bring this to Mr. Rosser's attention and try to analyze it.

Q Do you send memos to Rosser telling him what the simulator should be programmed for?

A No.

Q Does Rosser have any written description of what the simulator is programmed for?

A Yes.

Q What types of written descriptions, could you describe them?

A There is a currently correct listing of the programming for the computer, there is a maintained flow chart for the solution of the equations, and in there there is a set of mathematical equations that are utilized in the simulator, and there are continuous on the

1
2 modifications and corrections to those as we better
3 understand what is going on.

4 Q Is Rosser a licensed nuclear operator?

5 A Mr. Rosser has in the past obtained a Senior
6 Reactor Operator's License.

7 Q What, if any, documents do you review
8 to decide what should be programmed into the
9 simulator?

10 A We have in the past received reports of
11 transients occurring at some stations and that had
12 graphs with them that would show parameters
13 versus time, and more recently, there is a
14 very extensive program to analyze each of the
15 trips of B&W-type reactors to record the major
16 parameters of the nuclear steam supply system
17 and their behaviour with time, and to determine
18 the cause and ways that that might be prevented.

19 Q That last program is one that has been
20 implemented since the TMI accident, is that correct?

21 A That's right.

22 Q Prior to the TMI accident, what types
23 of reports of transients at B&W plants did you
24 review to determine what should be programmed
25 into the simulator?

1
2 A There were no readily available files
3 or reports that we knew of in B&W. There were
4 times when we might hear of an event and obtain
5 that information; it was a chance item that the
6 information was available or that it was something
7 we went looking for and by asking around, we
8 might then find that information.

9 Q Prior to the Three Mile Island accident,
10 is it correct that B&W did not have any regular
11 program under which its site representatives
12 would send to the Training Services Unit descriptions
13 of transients?

14 A That's correct.

15 Q Did anybody in your section
16 regularly review licensee event reports prior to
17 the Three Mile Island accident?

18 A No, nobody reviewed the events.

19 The Training Services Group did have
20 access to the summary reports, not the entire
21 event.

22 Q Not the entire report?

23 A Not the entire report, correct.

24 Q The summaries are much more cryptic
25 than the full LER, is that right?

1
2 A That's right.

3 MR. WISE: What is the meaning of
4 "cryptic"? A summary is a summary. It
5 presumably does not have all the information a
6 full report has.

7 As to whether or not a particular one
8 is cryptic or not, I don't see how this
9 witness could possibly answer that.

10 Q How frequently did you receive
11 summaries of licensee event reports?

12 A They were -- they came in the mail as
13 published by the AEC and Nuclear Regulatory
14 Commission. I do not know the frequency.

15 Q Was there anyone in the Training
16 Services Unit who was assigned to review LERs
17 or summaries of LERs?

18 A The review of LERs was regularly done by the
19 Lead Instructors. No one was specifically given
20 the assignment of doing that.

21 Q When you said the Lead Instructor
22 reviewed the LERs, did you mean the summaries
23 of the LERs?

24 A Yes. Thank you.

25 Q Prior to the Three Mile Island accident,

1

2

had you ever seen a full licensee event report

3

as opposed to just a summary of one?

4

A I don't remember.

5

Q You mean you have no recollection of
seeing a full LER? Is that right?

6

7

A That's correct.

8

Q Did the Lead Instructor have to
speak to you before he made a request for the
simulator to be programmed to include a new type
of event?

10

11

12

A No.

13

Q Did the Lead Instructor have to put
anything in writing in order to have the
simulator programmed to include a new type of event?

14

15

16

A No.

17

Q At the time that John Lind was Lead
Instructor, what was his salary?

18

19

A I'm sorry, I can't ...

20

Q You don't know?

21

MR. WISE: Do you know offhand?

22

THE WITNESS: I really don't.

23

A No, I don't know. There are records.

24

Q Was Lind a college graduate?

25

A Yes.

1

2

Q Prior to the Three Mile Island

3

accident, did you get reports from, or written

4

requests from anybody outside the Training

5

Department to add a particular transient to the

6

simulator?

7

A On numerous occasions the simulator was

8

used to check the performance of various things

9

that had occurred out in the world, or might occur

10

out in the world as an assistance to the engineering

11

Department.

12

Transients are not programmed into the

13

simulator. There are certain capabilities of

14

representing malfunctions that can be changed and

15

that allows the simulator to model those

16

malfunctions.

17

Q An Instructor running the simulator

18

can create on the simulator an appearance of a

19

transient taking place, isn't that right?

20

A Not exactly.

21

Q All right.

22

A The Instructor causes the computer model

23

to behave in a way that represents a particular

24

event. Or at least the start of an event.

25

Q Has it sometimes required additional

1
2 programming of the simulator so that the simulator
3 can faithfully show the start of a particular
4 transient?

5 MR. WISE: Has what required?

6 MR. SELTZER: I'm sorry?

7 MR. WISE: I'm not sure that you got
8 everything into your question that you
9 wished. You began your question with "Has
10 it."

11 MR. SELTZER: Has it ever happened.

12 MR. WISE: I don't know what "it"
13 refers to.

14 Q Has it ever happened that you had to
15 do some additional programming of the simulator
16 in order for it to be able to faithfully depict
17 the initial minutes of a particular transient?

18 A Yes.

19 Q Have you ever had requests from a
20 utility customer that a particular transient
21 not otherwise run on the simulator be run as part
22 of the training for its operators?

23 A I have not had such a request. That request
24 would have come to the Instructional Staff rather
25 than to me personally.

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Q Do you know whether any such request has ever been made?

A I don't know.

Q Have you ever gone out to a particular utility to meet with its management to determine whether the B&W training program met the utility's needs?

A Yes.

Q In those field trips do you ever get down to the nuts and bolts of whether particular transients are being modeled on the B&W simulator?

A I don't remember any such discussion.

Q Is it your understanding that such a discussion would have taken place with people who worked below you in the Training Services Unit?

A Yes.

Q What was the purpose of your visit to the Davis-Besse plant of Toledo Edison in September of 1977?

A As I recall, the purpose of the travels at that time was to maintain customer relations with the Training Department there, and the people in the Operations, and the Plant Superintendent of the

1
2 plant to listen for any suggestion they had for
3 change, how we might do things better, or new
4 services that we might offer to them or provide
5 to them.

6 Q For how long were you at the Davis-Besse
7 plant on that visit?

8 MR. WISE: Which visit now?

9 MR. SELTZER: The September 1977 visit.

10 MR. WISE: Have we established there
11 was only one in that month? I have allowed
12 you to jump in and lead him. I think we ought
13 to establish for the record just which trip we
14 are talking about and make sure the witness
15 understands which trip we are talking about.

16 Do you recall a specific trip in
17 September of 1977 to the Toledo Edison plant
18 at Besse?

19 THE WITNESS: Yes.

20 Q And am I correct in assuming that
21 there was just one visit that you made to Davis-Besse
22 in September of 1977?

23 A I would suspect that's true.

24 Q How long was your visit?

25 A I would suspect for one day.

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Q Am I correct that you visited Davis-Besse within 48 hours of a transient that they had?

A Yes.

Q And in particular, you visited them within 48 hours of a transient during which the PORV cycled several times and then failed in the open position?

A Yes.

Q You met during your visit with the B&W site representative, right?

A Yes.

Q His name was Faist?

A Yes.

Q You and Faist discussed the transient that had just recently occurred at Davis-Besse, right?

A Yes.

Q He advised you that the PORV had cycled several times?

A Yes.

Q He told you it had failed open?

A I do not remember that from my recollection at this time.

1

2

Q Did you prepare a trip report?

3

A I probably did.

4

5

Q Have you had occasion since the
Three Mile Island accident to review your trip
report?

6

7

A No.

8

Q Where would that trip report be?

9

A If it exists, it's in my chronological file.

10

11

Q I take it it was your practice at that
time to prepare trip reports?

12

A Yes.

13

14

Q Is there any place else where you would
file such a trip report?

15

16

A It might have been placed in the contract file
or the file related to Toledo Edison.

17

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MR. SELTZER: Bob Wise, I will try to
remember to write you a letter specifically
asking that you people be so kind as to look
for that trip report before the resumption
of Mr. Elliott's deposition next week, but
to the best of our knowledge, we have not seen
a copy of that trip report in any of the files
that have been produced.

Q To whom would you have sent that trip

1

2

report, if anyone?

3

A It would probably be written to Mr. Olds.

4

Q Did you discuss the transient that had

5

just occurred at the Davis-Besse plant with anybody

6

else out at the plant during your visit there?

7

A As I recall, I might have had a brief

8

discussion of it with a Mr. Hickey.

9

Q Who is Hickey?

10

A Mr. Hickey is an employee of the Toledo

11

Edison Company, and at the time was their

12

Supervisor for Training Services.

13

Q How did you and Faist determine that

14

the PORV had cycled several times?

15

A I remember looking at the pressure

16

versus time plots that had come from some

17

instrument in the plant, and we had them out on a

18

desk in his office and there was a very cyclic

19

line on the paper of pressure versus time.

20

Q Did that cyclic line indicate to you

21

and to Mr. Faist that pressure was being

22

intermittently relieved?

23

A Yes.

24

MR. WISE: I don't know how he can

25

say what it indicated to Mr. Faist unless

1
2 Mr. Faist said something. That's all right.
3 You have your answer. Go ahead.

4 Q If the PORV or pilot operated relief
5 valve had cycled several times and then failed in
6 an open position, is it your understanding of this
7 pressure line on the chart that it would reflect the
8 sticking open of the relief valve?

9 A I don't understand your question. Please --

10 Q You said you were looking at a strip
11 chart, is that right?

12 A Yes.

13 Q And the strip chart had a pen line
14 showing reactor coolant system pressure, is that
15 right?

16 A As I remember, yes.

17 Q And it showed a drop in pressure at
18 each point where the pilot operated relief valve
19 opened, right?

20 A That was the inference from looking at the
21 chart.

22 Q And it showed a rise in pressure as the
23 PORV cycled closed, isn't that right?

24 A That would have been the analysis of the trace.

25 Q Isn't it correct from your understanding

1
2 of how this tracing is created that if the pilot
3 operated relief valve had failed open, the tracing
4 would show a drop in pressure?

5 A Yes.

6 Q And it would be a drop not followed
7 by a rise until that point of relief was closed,
8 isn't that right?

9 A Yes.

10 MR. WISE: Excuse me. Could I have the
11 last two questions and answers read back?
12 I am afraid I may have lost the track some
13 place.

14 (Record read by the reporter.)

15 Q At some point prior to today you have
16 come to learn, have you not, that the pilot operated
17 relief valve at Davis-Besse Unit 1 did fail open in
18 September 1977?

19 A Yes.

20 Q As we have just reconstructed what you
21 and Mr. Faist were looking at, namely, the tracing
22 that reflected the opening and closing of the
23 pilot operated relief valve in September, I
24 believe it was September 24, 1977, am I correct
25 that from that tracing you would have known that

1
2 the pilot operated relief valve had stuck in
3 the open position on September 24, 1977?

4 A That would have been an assumption from
5 looking at the trace and knowing something
6 about what was going on.

7 I don't believe we could have absolutely
8 ascertained that that was so from strictly that
9 information.

10 Q But that assumption would have been
11 consistent with your assumption that the earlier
12 rises and falls in pressure reflected an opening
13 and closing of the pilot operated relief valve, isn't
14 that right?

15 A Yes, and knowing that that was that trace
16 and the other circumstances that existed at the time,
17 we might draw that inference.

18 Q Did that tracing show that after some
19 20 or 24 minutes the pressure relief was terminated?

20 A I don't remember being concerned or interested
21 in the pressure tracing beyond the cyclic portion
22 of it and coming to the conclusion that if the
23 valve had cycled a few times and sticking open,
24 that really wasn't unreasonable.

25 Q What wasn't unreasonable?

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A That it might have failed open.

Q Did you look for any other indications while you were out at Davis-Besse of whether the pilot operated relief valve had failed open?

A I did not concern myself with the incident further than my discussion briefly with Mr. Faist about the cyclic nature of this.

Q As the head of Training Services for B&W, did you make any attempt on September 25, 1977 when you were out at the Davis-Besse plant to learn how the operators had responded to this failure of the pilot operated relief valve?

A No, I did not.

Q Did you go to the control room to look at any of the records in the control room of the transient?

A No.

Q Did you ask to, or were you shown any other records of the transient?

A I do not remember seeing any other traces.

Q Do you remember asking to see --

A No.

Q -- any other records?

A No.

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Q When you got back to Lynchburg, did you make a point of telling anybody that they had just had a transient that might be of some interest out at Davis-Besse?

A No, I did not. I did not discuss this incident with anybody.

Q Did Faist write a cite problem report describing the transient?

A I do not know.

Q Did you see any records while you were out there that described the actuation of high-pressure injection during that transient?

A No.

Q John Lind has testified that he was aware that the high-pressure injection had been turned off at Davis-Besse while the pilot operated relief valve was stuck open.

Lind also testified that he was aware that the high-pressure injection had been terminated while reactor coolant system pressure was dropping, and pressurizer water level was rising.

Did Lind ever discuss the knowledge that he had of the Davis-Besse transient in

1
2 September of 1977 with you?

3 MR. WISE: I will object to the form
4 of the question but permit the witness to
5 answer.

6 THE WITNESS: I didn't hear all that.

7 MR. WISE: I objected to the form of the
8 question just so that the trial judge can
9 rule on it if it becomes necessary, but you
10 may answer the question if Mr. Seltzer
11 wishes to stand on the form as he posed it.

12 Q My question is did Lind ever discuss
13 with you the details of the September 24, 1977
14 transient at Davis-Besse?

15 A I do not remember any such discussion.

16 Q Did Lind ever come to you and say in
17 words or substance that he thought B&W ought
18 to consider modifying its training program to
19 include, as a regular part, preparing operators
20 for transients similar to the Davis-Besse transient?

21 A I don't remember any such.

22 Q Prior to the Three Mile Island
23 accident, did anybody come to you and suggest
24 that the September 24, 1977 Davis-Besse transient
25 should be modeled in the B&W simulator?

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A I don't remember anybody doing that.

Q Do you remember anybody coming to you and suggesting that the September 1977 Davis-Besse transient should be included in any way as a regular part of the B&W training program?

A Nobody came to me and suggested that.

Q When is the first time you became aware that during the September 1977 transient at Davis-Besse reactor coolant system pressure fell while pressurizer water level rose?

A To the best of my recollection, the first discussion of abnormal behaviour of pressure and pressure -- not "abnormal," but this behaviour of pressure and pressurizer level came to my attention on or about Tuesday, the 3rd or 4th of April, 1979.

Q You had first referred to it as abnormal behaviour.

Is it correct that the drop in reactor coolant system pressure at the same time that the pressurizer water level was rising was unexpected as far as you were concerned?

A No.

Q Is that a reaction which you would have anticipated?

1
2 A It's a reaction that is -- is anticipatable
3 by a person knowledgeable in the physics of light
4 water reactors.

5 Q I take it that the B&W PWR is such a
6 light water reactor?

7 A Yes.

8 Q It's a fact, is it not, that prior
9 to the Three Mile Island accident, there was no
10 situation for which the B&W simulator depicted
11 reactor coolant system pressure dropping while the
12 pressurizer water level rose?

13 A That's not correct, sir.

14 Q Could you describe under what
15 circumstances the B&W simulator depicted that?

16 A Any transient or any method employed on the
17 simulator to cause the reactor system pressure
18 to decrease without change in the system temperatures,
19 distribution of temperatures, will cause the
20 pressurizer water level to increase because of the
21 pressure coefficient of expansion of water,
22 basic phenomenon of water.

23 Q Am I correct that that would be a
24 relatively small rise in the pressurizer water
25 level compared to the type of rise that was

1
2 observed at Three Mile Island on March 28th 1979?

3 A They are closely related rises.

4 Q What do you mean "closely related"?

5 A Each of them are a decrease in pressure
6 causing the volumetric expansion of water.

7 Q The type of volumetric expansion that
8 you are describing could not cause a loss of
9 the air space at the top of the pressurizer, could
10 it? _p

11 MR. WISE: Which one are you asking
12 him to describe now, the one at Three Mile
13 Island or the one that can be done -- or he
14 has testified could be done on his simulator
15 prior to the Three Mile Island accident?

16 MR. SELTZER: The one that he has
17 said was done on the simulator prior to
18 Three Mile Island.

19 A The reduction of the volume -- the steam
20 space at the top of the pressurizer could be
21 reduced depending on the water level in the
22 pressurizer from which the incident begins.

23 Q Depending on what?

24 A The water level in the pressurizer when
25 you begin the transient or begin the changed

1
2 condition.

3 Q If the pressurizer was within its normal
4 range under the conditions that you said could be
5 simulated prior to the Three Mile Island accident,
6 would the steam space be lost?

7 A That is an engineering calculation.
8 I do not have the tables available at the
9 moment to say the extent of the rise.

10 Q What specific condition would cause
11 pressure drop and substantial pressurizer
12 level rise?

13 A There are two of them that are most common;
14 one of which is the failure of a spray valve
15 holding the spray valve open, or loss of the
16 heaters on the pressurizer.

17 Q Was the failure of a spray valve
18 something that was demonstrated on the B&W simulator
19 prior to the Three Mile Island accident?

20 A Failure of a spray valve was a casualty
21 that was used on the simulator.

22 Q And are you saying that the equipment
23 would show prior to the Three Mile Island accident
24 a drop in reactor coolant system pressure and a
25 rise in pressurizer level in response to that

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2

casualty?

3

A That's my understanding.

4

Q Would it cause the pressurizer to go solid?

5

6

A I'm not sure.

7

Q Is the loss of a heater a casualty that was demonstrated prior to the Three Mile Island accident?

8

9

10

A Yes.

11

Q Would that cause the pressurizer to go solid?

12

13

A I don't know.

14

Q In the casualty that you described involving a spray valve, that was a spray valve that fails open?

15

16

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A Yes.

18

Q If that is the only casualty and the heaters continue to operate, would there be any substantial disruption of pressure or pressurizer level?

19

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MR. WISE: What is a "substantial disruption"?

23

24

Q Would you see the movement that you were describing where reactor coolant system

25

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2 pressure dropped and the pressurizer level rose?

3 A I believe you would.

4 Q Isn't it a fact that the heaters
5 are supposed to be controlled automatically to
6 correct for the increased cooling by the
7 spray valve failing open?

8 A The automatic action of the heaters tends
9 to mitigate the situation.

10 Q You said that the other type of
11 casualty was a heater failing.

12 Isn't it also correct that the
13 automatic controls should call on spray
14 valves to operate to mitigate any effect caused
15 by a failed heater?

16 A No.

17 Q There is no automatic control on the
18 spray valves?

19 A Yes, there is automatic controls on the spray
20 valve.

21 Q And they are not automatically controlled
22 to balance the heaters?

23 A The spray valves are used to control high
24 pressure conditions, and the heaters make up the
25 heat lost in the pressurizer, and to the bypass

1
2 spray flow, and in the case of the heaters being
3 off the energy in the pressurizer will continue
4 to decrease.

5 Q Do you know whether Instructors were
6 discussing with students in the B&W training
7 program prior to the Three Mile Island accident
8 the possibility that under some casualty reactor
9 coolant system pressure could drop while pressurizer
10 level rose?

11 A I know that Instructors had utilized
12 loss of heater incidents and had use -- and spray
13 valve failing open incidents in the simulator,
14 and it's my understanding that discussion of those
15 casualties had taken place in the classroom and
16 at the simulator; both of those events produced
17 the phenomenon you speak of.

18 Q Were you present at any session
19 in which either of those casualties was being
20 discussed with operators?

21 A I do not remember being present.

22 Q Do you know for a fact whether any
23 Instructor specifically pointed out to any
24 operators the simultaneous drop in reactor
25 coolant system pressure and rise in pressurizer

1
2 level?

3 A I do not.

4 Q So you can't say for sure whether that
5 was ever discussed by an Instructor with any
6 operators who received training at B&W, can you?

7 A No.

8 Q You said a moment ago that nobody ever
9 came to you and suggested that the Davis-Besse
10 transient be incorporated in the B&W training
11 program prior to the Three Mile Island accident,
12 right?

13 MR. WISE: I believe he testified he
14 didn't remember anybody doing so.

15 MR. SELTZER: O.K.

16 Q You were asked in your deposition
17 by the NRC special inquiry at pages 23 and 24,
18 "To your knowledge, was there a conscious decision
19 made not to incorporate that transient," referring
20 to the Davis-Besse transient.

21 And you said "Yes."

22 Since you said nobody ever suggested
23 to you, that you can recall, that it be incorporated
24 in B&W's training, how did you know that a
25 conscious decision had been made not to incorporate

1
2 that transient in B&W's training?

3 A I'm not sure at this point.

4 Q Do you know what the basis of your
5 testimony was when you gave that testimony?

6 A The Davis-Besse incident, to my understanding,
7 requires a malfunction in a system that is
8 unique to Davis-Besse.

9 Secondly, it requires a manual trip
10 of the reactor, and to go through that set
11 of circumstances is most unrealistic in an
12 operational training mode to convince a student
13 that that's what he ought to do.

14 Q Do you know any person at B&W who
15 made a conscious decision not to incorporate
16 the Davis-Besse September 1977 transient
17 in B&W's training?

18 A I don't recall at this time.

19 Q Am I correct that it's your
20 present understanding that something led to a
21 challenge to the PORV in the Davis-Besse plant on
22 September 24, 1977?

23 A I understand that something caused the
24 PORV to open, yes.

25 Q Are you familiar with what the function

1
2 of the pilot operated relief valve is?

3 A Yes.

4 Q Am I correct that the pilot operated
5 relief valves have a set point so that they will
6 open before the ASME or code safety valves open?

7 A Yes.

8 Q Am I also correct that the set point
9 for the pilot operated relief valve is such that
10 it will open before the reactor trip point is
11 reached?

12 A Yes, and this combined with the previous
13 question is the setting of those systems -- those
14 valves and trip points prior to the Three Mile
15 Island incident, and they were changed by order of the
16 Nuclear Regulatory Commission in the summer of
17 1977.

18 MR. WISE: '79, I believe.

19 THE WITNESS: Excuse me, thank you,
20 Bill.

21 Q Your counsel is right, the summer of
22 '79?

23 A That is correct.

24 Q In the design of the B&W plant, there
25 are a number of different initiating events that

1
2 can cause a challenge or opening of the pilot
3 operated relief valve, isn't that right?

4 A We cannot speak to the design.

5 The as-constructed plant, there are
6 a number of -- more than one sequence of events
7 that can cause the PORV to open.

8 Q Let me show you a page of a document
9 that was marked at Al Womack's deposition entitled
10 "Events that Initiate PORV Operation."

11 MR. SELTZER: And we will mark this
12 as GPU Exhibit 44.

13 MR. WISE: I believe we had 44. We are
14 at 45.

15 MR. SELTZER: All right, 45.

16 (One-page document entitled
17 "Events that Initiate PORV Operation"
18 marked GPU Exhibit No. 45 for identification
19 as of this date.)

20 MR. WISE: Can we identify where
21 this document comes from?

22 MR. SELTZER: All I know is that it
23 came from Al Womack's file and Dr. Womack
24 said that he was familiar with it as being
25 a document from his files.

1
2 Q Have you had a chance to look at the
3 list of 16 events that can initiate PORV operation?

4 A You have given me a list. I have not
5 studied that list.

6 Q Can you take a moment and look at it,
7 please.

8 A I have looked at the document.

9 Q From your experience as the head of
10 Training since 1972, are you familiar with the
11 fact that most if not all of the 16 events listed
12 here are events that can initiate the operation
13 of the pilot operated relief valve?

14 A Based on my knowledge of nuclear power
15 plants, I would judge that most of these have
16 a possibility of increasing the reactor system
17 pressure and might rise to the level of where
18 the automatic system would open the PORV.

19 Q It's a fact, isn't it, that the
20 automatic opening of the pilot operated relief
21 valve is an event which you would anticipate would
22 occur during the life of a B&W nuclear plant,
23 isn't that correct?

24 A Yes.

25 Q In fact, you would anticipate that

1
2 it would occur many times over the life of a
3 plant, isn't that right?

4 A It's my understanding that the pilot
5 operated relief valves were provided as a part
6 of the B&W system to relieve the primary system
7 pressure on the trip of the turbine steam valves
8 and allow the reactor to remain in a non-trip,
9 or would not go to an over-pressure condition and
10 trip on this event, and it depends on the
11 action of the rest of the control system, but it
12 was -- those valves were intended by the designers
13 of the system to account for that event.

14 Q I think Mr. Wise will certainly
15 correct me if I'm wrong, but Al Womac testified
16 within the last couple of weeks that it was his
17 understanding that under the design and set points
18 that existed before the Three Mile Island accident,
19 the pilot operated relief valve in B&W plants
20 was expected to be challenged between two and
21 ten times a year.

22 Is it your understanding that
23 that frequency of operation of a pilot operated
2 relief valve was what was expected prior to the
3 Three Mile Island accident?

1
2 MR. WISE: I don't remember Mr. Womack's
3 testimony in detail on that point.

4 I do remember those numbers being
5 discussed, but I think the witness should
6 understand that what is being asked for is
7 his understanding regardless of anything that
8 Dr. Womack may or may not have testified
9 to; that should not influence your answer.

10 You are being asked by Mr. Seltzer
11 to give your understanding of how many times
12 the PORV was expected by B&W to be
13 challenged in the normal operation.

14 If you have an answer to that, you may
15 give it. If you don't have an answer,
16 you should say so, but Dr. Womack's testimony
17 should not influence your answer.

18 Q Is it consistent with your understanding --

19 MR. WISE: Are you withdrawing the prior
20 question?

21 MR. SELTZER: I am modifying it.

22 Q Is it consistent with your understanding
23 of the B&W system as it existed prior to the Three
24 Mile Island accident that the pilot operated
25 relief valve would be expected to function between

1
2 two and ten times a year on the average B&W plant?

3 A I am not familiar with the design
4 assumptions on the number of trips and
5 frequencies of those events.

6 Q Let me ask it in an obverse fashion.

7 Would it be inconsistent with the
8 understanding you had of the operation and function
9 of the pilot operated relief valve if it were
10 opening between two and ten times during an
11 average year of operation of a B&W plant?

12 A The pilot operated relief valve on B&W
13 type plants to the best of my understanding cycled
14 on the trip of the turbine and the timing of
15 the trip on the turbine and the trip of the reactor
16 depended on whether or not this occurred on the
17 reactor trip. It was not a commonly known fact
18 to me that these valves were cycling.

19 Q What do you mean by "cycling"?

20 A Coming open, actuating.

21 Q A single actuation open and then shut
22 you would call a cycling?

23 A That is a cycle.

24 Q Are you saying that prior to the
25 Three Mile Island accident, it was not known to you

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that these valves were opening with the frequency of
between two and ten times a year on the average per
plant?

A That is correct.

(Continued on next page.)

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Q Did you have an understanding that

they were opening less frequently?

A I did not concern myself with the opening at all of these valves.

Q At the time that you visited Davis-Besse in September of 1977 and learned that the pilot operated relief valve had cycled many times and you say you assumed you would have also seen that it had failed open, did you know then that there were as many as 16 different events in a B&W plant that could lead to an actuation of the pilot operated relief valve?

A I did not at that time know of a list of 16 events --

Q Did you know -- I'm sorry, I didn't mean to interrupt you.

A -- that would cause this to open.

Q Did you know that there were a multiplicity of events that could cause the pilot operated relief valve to open?

A I believe based on my understanding of the thermodynamics and physics of a B&W type nuclear plant, that I could have constructed a list of one or more means or initiating events that could have

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2 caused that valve to be opened.

3 Q In other words, on September 26, 1977,
4 you knew that the particular initiating event that
5 led to the opening of the pilot operated relief
6 valve at Davis-Besse was not the only event that
7 could initiate the opening of a pilot operated
8 relief valve, isn't that correct?

9 A I could have known that on analysis at the
10 time. I did not make any such analysis.

11 Q But it was part of your fund of
12 knowledge at that time, whether you drew that
13 conclusion or not, isn't that right? That's a
14 convoluted question.

15 A Thank you.

16 Q Let me make it easier.

17 I am not asking you whether you drew
18 the conclusion that day but I am asking you as of
19 September 1977, you knew that there were more
20 events than the one particular event that had
21 opened the Davis-Besse valve on September 24,
22 1977 that could also cause an opening of the pilot
23 operated relief valve; isn't that right?

24 A I don't believe that's a correct
25 characterization of that. I do not believe that

1
2 I knew that there was a list of things. I could
3 have constructed a list given the question of how--
4 what things would cause this to come open.

5 Q You knew that it opens in response
6 to a rise in pressure in the reactor cooling
7 system, right?

8 A Yes.

9 Q And you knew that there were a
10 multiplicity of initiating events that could cause
11 a rise in system pressure, isn't that correct?

12 A I believe my understanding of a pressurizer
13 water reactor would allow me to do that, yes.

14 Q So you knew in September of 1977
15 that the one particular initiating event that had
16 led to the opening at Davis-Besse was not the only
17 event that could lead to an opening of a pilot
18 operated relief valve, isn't that right?

19 A There is only one event that leads to the
20 opening of a pilot operated relief valve --
21 correction, there are two events. One of them is
22 the increasing pressure in the proper operation of
23 the control system; the second one is the
24 malfunction in the control system that causes
25 the valve to open.

1
2 Those are really the two events that
3 allow that valve to come open.

4 Q There can be quite a variety of
5 events that can cause the pressure to rise in the
6 reactor cooling system, isn't that right?

7 A That's correct.

8 Q And you knew that there could be a
9 variety of events that could cause pressure to
10 rise?

11 A Yes.

12 Q So that it must follow as night the
13 day that you knew that there were other events
14 besides the one that had caused the Davis-Besse
15 valve to open that could have caused a pilot
16 operated relief valve to open in September of 1977,
17 isn't that correct?

18 A I don't agree with your statement of those
19 conclusions.

20 Q I will try it again. I am a persistent
21 man.

22 You said that you knew there were a
23 multiplicity of events that could cause pressure
24 to rise in the reactor coolant system in September
25 of 1977, right?

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A That is correct.

Q You knew that such a rise in pressure is what actuates the pilot operated relief valve, right?

A Yes.

Q You also knew there was only one of those multiplicity of events that had occurred at Davis-Besse on September 24, 1977, isn't that right?

A Yes.

Q Rather than focusing on why B&W did not model the particulatr initiating event that started the transient at Davis-Besse, do you know whether any conscious decision was made not to incorporate the failure open of a pilot operated relief valve after the Davis-Besse events and the Three Mile Island event?

A I don't know.

Q When you were telling me earlier that there was something unique about the Davis-Besse transient, am I correct you were focusing on the original initiating event and not on the failure open of the pilot operated relief valve?

A Yes.

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2 Q When you learned at Davis-Besse on
3 September 25, 1977 that the pilot operated relief
4 valve had opened, was that an unexpected occurrence
5 as far as you were concerned, the opening of the
6 relief valve?

7 A At the time I was not concerned with the
8 opening of the relief valve.

9 Q Am I correct that you have no
10 recollection of thinking there was anything unusual
11 about the relief valve being challenged under that
12 transient?

13 A That's correct.

14 Q It is correct, isn't it, that the
15 initiating event at Davis-Besse led to a loss of
16 feedwater?

17 A Yes.

18 Q Are you familiar with the acronym
19 AOO?

20 A No, I am not.

21 Q Have you ever heard of an anticipated
22 operational occurrence?

23 A Yes, in recent times.

24 Q Do you understand that an anticipated
25 operational occurrence is something that the

Elliott

designers of a plant are expected to anticipate will occur during the life of the plant?

A Yes.

Q I take it you are also aware that a loss of feedwater is an anticipated operational occurrence, isn't that right?

A I understand that loss of feedwater is one of the anticipated operational occurrences, yes.

Q It is a fact, isn't it, that a loss of feedwater is in fact something that happens on the average of twice a year at B&W plants?

A I can't affirm or deny that.

Q Are you aware that the occurrence of loss of feedwater is something on the order of at least once or twice a year?

A I can attest that loss of feedwater is an event that has occurred at B&W power plants, power plants using B&W nuclear steam supply systems.

Q You are aware that as it is indicated by item 10 on GPU Exhibit 45, that loss of feedwater is an event that can lead to rise in pressure sufficient to open the pilot operated relief valve, isn't that correct?

A Loss of feedwater can lead to a rise in

1
2 pressure and cause the pilot operated relief valve
3 to open.

4 Q Prior to the Davis-Besse events in
5 September of 1977, were you aware of other
6 transients in which pilot operated relief valves
7 had been called upon to open?

8 A I don't recall any.

9 Q Were you aware of any transient in
10 which a pilot operated relief valve had failed open
11 prior to the Davis-Besse event?

12 A I am not aware of any event.

13 Q Were you aware prior to the Three
14 Mile Island accident of any failure to operate as
15 designed of a pilot operated relief valve?

16 A The event that comes to mind is the
17 Davis-Besse event that we have discussed earlier.

18 Q Other than that, were you aware of
19 any other failure to operate properly of a pilot
20 operated relief valve?

21 A I don't remember any event.

22 MR. WISE: Off the record.

23 (Discussion off the record.)

24 MR. SELTZER: Why don't we take a
25 short break.

(Recess taken.)

BY MR. SELTZER:

Q Before the start of the break, we were discussing, among other things, the frequency of certain anticipated operational occurrences such as feedwater transients. I believe you indicated that you were not aware of the frequency with which feedwater transients occurred in plants, is that right?

A That's correct.

Q You also said that you weren't aware of the frequency with which pilot operated relief valves would be called upon to operate in B&W plants, is that right?

A That's correct.

Q In order to provide training for operators, does the Training Services Unit make any investigation of the frequency with which transients of different types occur in B&W plants?

A No investigation of frequency of events was done prior to our most recent programs to investigate each event that does occur.

Q That program that you are referring to is a post-Three Mile Island program?

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A That is correct.

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Q In discussing events that could cause a pilot operated relief valve to open, you referred to certain turbine trips.

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8

Is it your understanding that a turbine trip from full load will generally actuate a pilot operated relief valve?

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A It is my understanding that that was the event that was postulated and why the PORV's were installed on the B&W type nuclear steam supply systems so that that event could be coped with without tripping the reactor.

14

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Q In other words, it was anticipated in the design of the B&W plant that a turbine trip would generally cause a rise in primary system pressure?

18

A Yes.

19

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22

Q Therefore, one of the reasons for installing a pilot operated relief valve was so that rise in pressure would not trip the reactor?

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A Yes.

Q And it was intended that by not tripping the reactor, the plant could be brought back on line generating electric power more

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quickly?

A Yes.

Q What is the level of power to which the reactor would be brought down following a turbine trip?

A Assuming the systems all operate correctly and the reactor does not trip, lots of other things but the reactor does not trip, the system will go to 15 percent power.

Q Is it the design of the system that the thermal energy being generated at 15 percent power can be dissipated without using the turbines?

A Yes.

Q Is it your understanding that in actual operation, B&W plants do survive turbine trips without tripping the reactor by relieving pressure through the pilot operated relief valve?

A The B&W system is capable of surviving a reactor trip --

Q Turbine trip.

A Excuse me, please correct the record, turbine trip, if the rod configuration is at the right level and that the system runback of reactor power by utilizing the rod system is adequate to

1
2 reduce reactor power fast enough, then the reactor
3 can survive and this depends on the type of
4 configuration of the rod system at the time a trip
5 occurs.

6 The ability to run back from a
7 turbine trip was a capability of a -- what was
8 called a rod-controlled B&W plant, the 177, where
9 power level was controlled by the rods from 5 to
10 100 percent power. There was another^E configuration
11 of the system which was utilized for higher power,
12 the 2772 megawatt plant, which was a fixed rod
13 configuration and reactor power was controlled
14 on boron. There were two plants of this
15 operation at the time of -- well, to be built.
16 One of them was Rancho Seco, the other one was
17 Davis-Besse, and the third one was Three Mile
18 Island 2.

19 Those plants could not survive a
20 turbine trip without a reactor trip because of
21 the configuration of the rods and the ability to
22 insert reactivity or negative reactivity in the
23 core and reduce power fast enough.

24 Q That is because TMI-2 and the other
25 two plants use a borated water system for moderating

1
2 the reaction in the core instead of changing the
3 position of the control rods?

4 A All B&W type power plants use borated water.
5 It was the control of power of the system, whether
6 it was on rods or boron concentration that made a
7 difference.

8 Q But you are saying that at TMI-2
9 boron concentration is used to control the rate
10 of reaction as opposed to the control rods, is that
11 right?

12 A Yes, for normal power changes.

13 Q So if there is a turbine trip in
14 TMI-2, it is going to lead to a reactor trip, is
15 that right?

16 A Yes.

17 Q Is a run up in pressure following
18 the turbine trip that will lead to the tripping of
19 the reactor at TMI-2?

20 A Yes.

21 Q Prior to the Three Mile Island
22 accident, if there were a turbine trip, the pressure
23 would rise in the reactor coolant system, right?

24 A If there was a turbine -- state the --

25 THE WITNESS: Reread the question,

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please.

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Q I will rephrase it.

4

A O.K.

5

Q Prior to the Three Mile Island

6

accident, if the Three Mile Island Unit 2 turbine

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tripped at full load or near full load, it would

8

lead to a rise in reactor coolant system pressure,

9

right?

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A Yes.

11

Q En route to the reactor trip set

12

point, the rising pressure in the reactor coolant

13

system would first trip the pilot operated relief

14

valve, wouldn't it?

15

A Yes.

16

Q So at TMI-2, every turbine trip at

17

or near full load would lead to an actuation of

18

the pilot operated relief valve, isn't that right?

19

A Well, that's generally how that worked, yes.

20

Q Were there other types of transients

21

or upsets in TMI-2 that would lead to an actuation

22

of the pilot operated relief valve but which would

23

permit the reactor to stay critical?

24

A Using engineering judgment, events similar

25

to the list you have given me, if done in a very

1
2 very, controlled fashion, could have, using the
3 set points as they existed before the Three Mile
4 Island 2 accident, caused some of these things to
5 happen. They could cause reactor system
6 pressure to rise to the PORV set point without going
7 high enough to cause the reactor trip.

8 Q Referring --

9 A It would have to be a very controlled
10 experiment.

11 Q The list you are referring to is
12 GPU Exhibit 45, is that right?

13 A Yes, and some of these in -- for instance,
14 item 15, "Inadvertent closure of MSIV," and I am
15 assuming those are the main steam intercept valves.

16 Q Main steam isolation valves is what
17 Al Womack called them. Is that what you meant?

18 A They are the same. If those valves closed,
19 that is not a controlled event. You could not
20 control that event. They either are open or
21 shut valves and...

22 Q So, in other words --

23 A Some of these couldn't do that. A partial --

24 Q When you say "couldn't do that," just
25 so the record is clear, are you saying that for

1
2 some of these events, if they occurred the
3 pressure would rise through the point of actuating
4 PORV, it would actuate the PORV and go right on
5 up to the reactor trip point?

6 A Yes.

7 Q You said that for some you could go
8 to the pilot operated relief valve set point
9 but not reach the reactor scram set point under
10 very controlled conditions, is that right?

11 A Yes.

12 Q What did you mean by "very controlled
13 conditions"?

14 A We would have to set up an experiment where
15 we had absolute control of things and did it in a
16 very controlled and deliberate fashion.

17 Q Are you saying that under most operating
18 conditions, you would expect that if one of these
19 events listed on GPU Exhibit 45 occurred such that
20 pressure rose up to the pilot operated relief valve
21 set point, it would also rise up to the reactor
22 scram set point?

23 A Yes. That would be my engineering judgment
24 at the moment.

25 Q And so that everybody understands

1
2 what we have been saying, "scram" means that
3 the reactor is shut down so that there is no further
4 criticality or chain reaction in the reactor?

5 A That's not true. It's -- it's shut down to the
6 extent that the control rods have been inserted in
7 the reactor by gravity and the electric power will
8 have been removed from that control system that does
9 allow the rods to drop.

10 MR. WISE: But are we all clear
11 when you speak of "scram" you are talking
12 about the reactor no longer being critical
13 or are you talking about a situation in which
14 there was a reduced power situation?

15 THE WITNESS: It's intended that when the
16 rods go in that the reactor is no longer
17 critical in the jargon or the vernacular of
18 nuclear physics.

19 MR. SELTZER: O.K.

20 Q And I think everybody in the room
21 understands the concept.

22 What does it mean when the reactor
23 is no longer critical?

24 MR. WISE: I think the witness has
25 indicated that he would feel more comfortable

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with the question if he were asked to define
what was meant by "criticality."

3

4

Q I will go along with that.

5

Do you want to answer your question?

6

A I'm sorry, it's for your information that
I am here.

7

8

Q If you don't want to answer my question,
answer your question.

9

10

What do you mean by "criticality"?

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A Criticality is a condition in the nuclear
reactors such that the ratio of the neutrons
generated from fission, from one generation, is
equal to the number of neutrons generated from
fission -- the next generation, or the ratio
of the neutron population occurring from fission
is -- remains at one, from one generation of the
neutrons to the next generation, those neutrons
from fission.

20

MR. WISE: Off the record.

21

(Discussion off the record.)

22

BY MR. SELTZER:

23

Q When did Perks leave B&W?

24

A I can't tell you exactly. My guess is
some time in 1978.

25

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Q Have you ever determined from any

3

source whether Lind, who was an Instructor at

4

the time he says he learned about the Davis-Besse

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event and the termination of high-pressure

6

injection, have you ever found out whether Lind

7

spoke to Perks about whether Davis-Besse should

8

have been incorporated as a matter of practice

9

in the B&W training program before Three Mile

10

Island?

11

A I don't know anything about that.

12

Q Have you ever asked Lind whom he spoke to

13

about the Davis-Besse event?

14

A I don't remember discussing that.

15

Q Have you ever learned from any source

16

with whom, if anyone, Lind discussed the Davis-Besse

17

event?

18

A I don't know of any source.

19

Q Have you read any of the depositions

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given by Lind?

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A I don't think so.

22

Q Have you read any depositions

23

given by anybody other than you?

24

A No.

25

Q Have you read summaries of any of the

depositions given by anybody other than you?

A No.

Q Have you reread the depositions which you have given?

A I have reread in recent times the depositions that I gave for the Kemeny Commission.

Q You did not reread the NRC special inquiry deposition?

A I have not reread that, no.

Q Has anybody ever discussed with you what the other B&W witnesses testified to at their depositions?

A I have discussed other people's testimony with my attorneys, the company's attorneys (indicating).

Q Have you ever discussed anybody else's testimony with anybody else other than attorneys?

A Not to my knowledge.

Q Have you seen any of the deposition testimony given by Al Womack in this litigation?

A No.

Q Has anybody discussed with you Al Womack's deposition testimony?

A I have had brief conversations with the

1
2 attorneys, my attorneys.

3 Q Regarding Dr. Womack's deposition?

4 A Yes.

5 Q Have you spoken to Dr. Womack at
6 any point during or since the time he was
7 deposed?

8 A Yes.

9 Q Have you discussed with him the
10 content of his deposition?

11 A No.

12 Q Earlier this afternoon you were asked
13 about events which the simulator could show
14 prior to the Three Mile Island accident which
15 would result in a drop in pressure in the reactor
16 coolant system and a rise in pressurizer water
17 level.

18 Do you recall that?

19 A Yes.

20 Q And you referred us to two different
21 events, one was a failure open of a spray valve?

22 A Yes.

23 Q And the other was the loss of a
24 pressurizer heater, right?

25 A The heaters.

1

2

Q All the heaters?

3

A Yes, that would be it, that would be necessary.

4

5

Q On the failure open of a spray valve, you said that if the temperature were held constant, the pressure would drop and that would produce the change in water level, is that right?

6

7

8

9

A The temperatures in the reactor coolant system must remain the same.

10

11

Q If they remained the same, then there would be a drop in pressure, is that what you told me?

12

13

14

A Yes.

15

16

17

Q And that drop in pressure would cause an expansion in the water inventory, is that what you are telling me?

18

A Yes.

19

20

21

Q And the effect -- that would lead to a rise in the pressurizer would be due to the compressibility of water, is that right?

22

A Yes.

23

24

25

Q Are you familiar with the mathematical formulas for determining expansion of water under constant temperature and changing pressure?

1
2 A Yes.

3 Q What is the equation?

4 A Well, over very small changes in pressure,
5 that is the coefficient of volumetric expansion,
6 which assumes the temperature is constant and
7 the only thing that is changing is pressure,
8 and that's --

9 Q What would the coefficient of expansion
10 be?

11 A That's tabulated in the ASME tables on water.
12 I do not know that number.

13 Q If I showed you the ASME tables, you
14 would be able to calculate what the expansion would
15 be knowing the inventory in a reactor cooling
16 system?

17 A We would work out that problem, yes, given
18 that table and the appropriate volumes.

19 Q Do you know what the volume is in a
20 B&W lowered loop 177 plant?

21 A Approximately.

22 Q What is it?

23 A About 11,000 cubic feet.

24 Q And is it your testimony that the
25 pressure drop that would result from a failed open

1
2 spray valve would result in a rise in pressurizer
3 level of a magnitude similar to that seen during
4 the Three Mile Island accident?

5 A No, I don't think that's my testimony.
6 I don't know what the rise is at the moment.

7 Q So you don't know whether it would be
8 a rise that would be anything even close to the rise
9 that was observed during the Three Mile Island
10 accident, do you?

11 A Without doing the calculations, I do not
12 wish to speculate.

13 Q So you don't know as you sit here
14 now whether simulating a transient such as a
15 failed open spray valve would give an operator a
16 view of a rise in pressurizer level that would
17 be anything like the rise observed during the
18 Three Mile Island accident, do you?

19 A Would you explain to me what "like" is?

20 Q I mean of a magnitude that is anything
21 close to the magnitude observed during the Three
22 Mile Island accident.

23 A What magnitude was observed, please?

24 Q Several hundred inches of rise in
25 water level.

1

2 A "Several" meaning 300?

3 Q 200 or more.

4 A Without doing the calculations, we can't
5 tell that.

6 Q Have you ever seen that transient run
7 on the B&W simulator?

8 A I don't remember.

9 Q From your experience of eight or nine
10 years as the head of Training, do you know whether
11 that transient of failed open spray valve
12 would result in a 200-inch rise in water level in the
13 pressurizer?

14 A That is similar to the previous question.
15 It is an engineering calculation and I don't know
16 the answer at the moment.

17 Q You don't know whether it was a rise
18 of two inches, do you?

19 A I know that it will rise. The calculation
20 of how much depends on the use of the compressed
21 water tables, and it's an engineering calculation,
22 and it also depends on the pressure to which it
23 is decreased.

24 Q But from your eight or more years as
25 the head of the Training Department, you don't know

1
2 how much the rise will be, is that right?

3 MR. WISE: Mr. Seltzer, you have asked
4 him that question about five times now, and he
5 has given you the same answer five times.

6 MR. SELTZER: All right.

7 MR. WISE: He doesn't know.

8 Q Is that right?

9 A What?

10 Q Is your lawyer right?

11 MR. WISE: You can ask him one more
12 time and that's the end.

13 The question, Mr. Elliott, is whether
14 you know the amount of the rise in the
15 pressurizer level upon that casualty without
16 more facts.

17 THE WITNESS: No.

18 MR. WISE: All right. You have it.

19 I don't think we have to ask it again.

20 Q You testified that you had a meeting
21 with representatives of Metropolitan Edison
22 to find out what their interests were in training.

23 How many times did you meet with them
24 before the Three Mile Island accident?

25 A Various members of the Three Mile Island

2

staff, at least ten times.

3

Q How many times did you visit them at the plant?

4

5

A Certainly greater than six.

6

Q Would there be trip reports of your visits?

7

8

A I don't know. There probably are, but ...

9

Q O.K.

10

And those should either be in your chronological file or in the contract file or both?

11

12

A Yes.

13

Q What does the term "saturation" mean to you?

14

15

A Well, the term "saturation" has a number of uses, and I suspect in this hearing we should -- or I will confine myself to saturation as relative to water, and saturation conditions are the conditions at which the water boils or is at the boiling point and there may be some steam formation, and the amount of steam in the water may vary from zero to 99.9 percent, or the water in the steam I suppose is a better term for that, better known as quality.

21

22

23

24

25

Q Saturation occurs at the convergence

1
2 of particular temperatures and pressure, is that
3 right?

4 A There is experimentally determined a
5 temperature for every pressure at which water will
6 boil; that is the point of saturation.

7 Q When you say "experimentally determined,"
8 it is also an imperical fact, isn't it?

9 A That would be how you -- you have to conduct
10 the experiments to get the imperical data.

11 Q There is nothing theoretical about
12 the occurrence of saturation of water, is there?
13 It's a known fact that water boils, right?

14 A Yes.

15 Q And it's also known that for every
16 temperature, there is a pressure which is the
17 threshold of saturation for water, right?

18 A Yes.

19 Q In a reactor coolant system, what is the
20 significance of the occurrence of saturation? What
21 is the principal significance?

22 MR. WISE: At any particular point
23 in the system? I mean for instance, we can
24 talk about the pressurizer or we can talk
25 about the core or --

1
2 MR. SELTZER: Let's talk about
3 it in any place except the pressurizer.

4 Let me back up because I want to focus
5 on what is of interest to me.

6 Q In your training of operators at B&W,
7 what are you teaching people now as the principal
8 significance of saturation occurring in the
9 reactor coolant system other than in the pressurizer?

10 A The current approach to saturation conditions
11 is that this violates the basic principles on which
12 the pressurized water reactors were developed.
13 They were intended to be operated in the pressurized
14 mode, and once the system leaves the pressurized
15 mode, we are -- have essentially produced a condition
16 that must be dealt with.

17 Q When you say "operated in the
18 pressurized mode," you mean operated with only
19 water in the reactor coolant system, not steam?

20 A Yes, that's the basic premise of pressurized
21 water reactors.

22 It's fundamental to the -- to the
23 operation of pressure water reactors, and when they
24 are no longer pressure water reactors, it's a
25 problem. It's basic to the whole premise of reactor

1
2 operations.

3 Q You say this is what is being done in
4 your teaching now, is that right? That's how you --

5 MR. WISE: Is what being done in his
6 teaching? I missed the premise of that
7 question.

8 MR. SELTZER: Teaching people that it's
9 fundamental to the operation of a pressurized
10 system, that there be no saturation.

11 MR. WISE: Did he understand whether
12 that is being taught by B&W?

13 THE WITNESS: No, I don't understand.
14 I don't understand the question then.

15 Q My last question had been, in your
16 teaching that you are doing at B&W, what are
17 you telling operators is the principal significance
18 is the appearance of saturation, and you said well, as
19 we are teaching it now, and you want on and said
20 what you told me.

21 A Yes. In reality, to the best of my knowledge,
22 we have always taught the pressurized water
23 reactors must be operated in the pressurized region.

24 Q Let me read to you some testimony
25 that you gave before the NRC Special Inquiry Group

on October 17, 1979 at page 22. You were asked "Prior to the Three Mile Island incident, how was the relationship between saturation temperature and pressure condition treated in the training process?

You gave this answer: "Within the limits of those services provided by Babcock & Wilcox, the relationship between temperature and pressure and steam conditions were treated relative to the operation of the pressurizer, and, to the best of my knowledge, we did not discuss the performance of the reactor coolant system under loss of coolant conditions in the sense of pressure temperature relationships and steam formation."

In your NRC deposition, were you asked that question and did you give that answer?

A It sounds reasonable.

If you read correctly, that may be a reasonable characterization. I would rather that the court reporter copy it out of the book.

MR. WISE: We will trust Mr. Seltzer to read it correctly.

On Mr. Seltzer's representation that that is your testimony, I assume you have no reason to believe it is not your testimony?

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THE WITNESS: That's correct.

Q Was that answer correct when you gave it, and do you still believe it to be correct?

A It's essentially correct, yes.

Q You were also asked in the next question and answer, also on page 22 and continuing on to page 23, "Were the operators or students made aware of what would happen if the reactor cooling system pressure approached or reached saturation pressure corresponding to the primary system temperature?"

"Answer: The Training program for operational personnel for nuclear power plants is defined in American National Standard/ANS 18.1-1971 as revised in American National Standard/ANS 3.1-1978, and in that includes a basic training program which includes thermodynamics, fluid flow, hydraulics, that was to be taught and that information provided to the operator by the owning utility. Babcock & Wilcox did not conduct that instruction for any of its customers in the seven years that I have been here. It was provided to one customer as a subcontract to another organization. That information was primarily supplied by the

owners to their own people."

In your NRC special inquiry deposition, were you asked that question and did you give that answer?

A That seems like a reasonable characterization of my testimony.

Q Was that answer correct when you gave it, and do you still believe it's correct?

A Yes.

Q Since when has John MacMillan been the head of NPGD?

A Well, Mr. MacMillan assumed duties as head of NPGD at the same time the Customer or Training Services changed from a group to a section, and we reorganized all of the NPGD, and that is '74 maybe.

Q So he's been the top honcho in the division since 1974?

A He's been the General Manager and Vice President since that period of time.

Q Where did he come from before then?

A He was previously the Department Manager for a department called the Reactor Department.

Q Was the Reactor Department the

1
2 predecessor to NPGD?

3 A No. NPGD incorporated larger groups of people
4 than just the Reactor Department.

5 Q Do you know who MacMillan's predecessor
6 was?

7 A I believe it was Mr. Ranker.

8 Q Prior to the Three Mile Island
9 accident, did you have occasion to meet with
10 Mr. MacMillan with any regularity?

11 A I did not meet in official capacities
12 with Mr. MacMillan on a regular basis. It was
13 very unusual that I met with him.

14 Q Were there occasions when you did meet
15 with Mr. MacMillan?

16 A Yes.

17 Q How frequently would you meet with him
18 for business purposes?

19 A It could not have been more than once per
20 year and probably less.

21 Q Was it generally a fairly important
22 occasion when you met with him?

23 MR. WISE: If you can answer a
24 question phrased that way, I will allow you
25 to, but I will object to the form at this

1
2 point.

3 A I --

4 Q In your estimation, did MacMillan
5 have something important to discuss with you when
6 you met with him?

7 MR. WISE: Important to whom,
8 Mr. MacMillan or Mr. Elliott?

9 Q No, in your estimation, Mr. Elliott.

10 MR. WISE: I still stand on the request
11 for a clarification.

12 Do you want Mr. Elliott's answer
13 as to whether it's his estimation it was
14 something important to him?

15 MR. SELTZER: Yes.

16 MR. WISE: Meaning, Mr. Elliott, it may
17 have been very unimportant to Mr. MacMillan.

18 MR. SELTZER: We will ask Mac
19 when we get him as a deponent.

20 Q But I am asking you, Mr. Elliott,
21 did you believe that Mr. MacMillan was meeting
22 with you to discuss something that was important?

23 A When I met with Mr. MacMillan, it was an
24 important business item.

25 Q Did you ever, prior to the Three Mile

1
2 Island event, get memoranda from Mr. MacMillan?

3 A Prior to the Three Mile Island I have
4 received memorandums from Mr. MacMillan. I do
5 not recall that any of those memorandums were
6 directed to me specifically. I could have been a
7 copyee of another memorandum.

8 Q When you deal with Mr. MacMillan, what
9 do you call him?

10 A John.

11 Q Have you always called him John?

12 A Yes.

13 MR. SELTZER: I would like to mark as
14 GPU Exhibit 46 for identification a
15 memorandum from Mr. Elliott to Mr. Olds
16 dated November 8, 1978, subject: "J. H.
17 MacMillan's Concerns."

18 (Memorandum from Mr. Elliott to Mr. Olds
19 dated November 8, 1978, subject: "J. H.
20 MacMillan's Concerns" marked GPU Exhibit
21 No. 46 for identification as of this date.)

22 Q Is GPU Exhibit 46 a copy of a memorandum
23 which you sent to Mr. Olds on or about November 8,
24 1978?

25 A It appears to be.

1
2 Q You said that the subject was J. H.
3 MacMillan's concerns.

4 Are the items 1, 2, and 3 that you have
5 identified in your memorandum items of concern which
6 MacMillan had expressed?

7 A From reading the memorandum, being almost three
8 years since it was written, that would be my
9 assumption.

10 Q You state in the first paragraph, "I have
11 considered the questions asked by you on the
12 difficulties associated with NPGD. The
13 following remarks address each phase in particular."

14 First, were the questions asked or
15 MacMillan's concerns something that had been
16 communicated to you in writing?

17 A From reading the memorandum and knowing
18 the people at the time, I suspect that this is a
19 result of a group meeting of the Managers that
20 reported to Mr. Olds.

21 Q Were other Managers asked to respond to
22 MacMillan's concerns?

23 A I don't know.

24 Q Do you know whether, from your
25 recollection, anybody else wrote responses to

1

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these items?

3

A I don't know.

4

5

Q Item 1 you stated was "B&W's and NPGD's inability to anticipate industry trends."

6

7

8

9

Underneath that you wrote, "We have in the past tended to be an industry follower with respect to innovations in such areas as load following, core fuel limits, et cetera."

10

11

When you say "We," are you referring to B&W and NPGD?

12

A Yes.

13

14

15

Q When you say "an industry follower," did you mean that you were following other manufacturers of nuclear steam supply systems?

16

A Yes.

17

18

19

20

Q You said in the next sentence, "It appears we have taken an extremely definite position with respect to reacting to trends rather than anticipating what might happen."

21

22

You used the word "trends." Trends in what?

23

24

A At this time I cannot reconstruct the conditions that existed at that time.

25

Q You said that, "Our R&D efforts have

1
2 been directed to the area of response to technical
3 problems that have arisen in the scope of supply
4 associated with existing contracts."

5 Is it that direction of the
6 research and development efforts that you were
7 referring to when you said in the prior sentence,
8 "we have taken an extremely definite position"?

9 A I'm sorry, I just cannot reconstruct what
10 the thoughts were at the time and the reasons why these
11 words were used.

12 Q I take it at the time you wrote this
13 to Mr. Olds, you believed that what you were
14 stating was accurate, is that right?

15 A Yes.

16 Q You refer to load following and core
17 fuel limits in your first sentence under item 1.

18 Those are areas of technology that
19 deal with product design rather than training
20 of operators, right?

21 A That's correct.

22 Q What were some of the other areas
23 in which you thought B&W and NPGD tended to
24 be a follower when you used the word "et cetera"?

25 A I'm sorry, this has been too long ago for me

1
2 to recall the conditions that existed in 1978.

3 Q Your prescription is stated in the
4 sentence that begins, "To change our position."

5 Do you see that sentence?

6 A Yes.

7 Q You said, "To change our position, it
8 will be necessary to increase our awareness of the
9 customer's perceived problems with the B&W system
10 through increased contact with the technical
11 representatives of operating customers and increased
12 sales activity with the utility management."

13 Do you know whether, after you wrote
14 this and prior to the Three Mile Island accident,
15 anything was done to follow your prescription?

16 A In this reading it, we had instituted a
17 B&W representative at every site.

18 Q What do you mean, "In this reading it"?

19 A To read this sentence that you just quoted.
20 In response to those kinds of activities, B&W, at
21 the company's expense, provides an engineer at every
22 nuclear power plant to try to connect to the
23 operating people and anticipate their difficulties
24 and problems.

25 Q Am I correct that that is something

1
2 that was instituted after the Three Mile Island
3 accident?

4 A Yes.

5 Q When was that instituted?

6 A It was instituted before the Three Mile
7 Island --

8 Q When, before this memo was written or
9 after?

10 A I can't tell you specifically what happened.
11 The program that is referred to is the resident
12 engineer program, and when it was instituted, I don't
13 know.

14 Q Did you take any action in the
15 Training Unit to increase contact with the
16 technical representatives of operating customers?

17 A No increase over the activities that the
18 Training Service Department had undertaken for many
19 years was done.

20 Q Items 2 and 3 you describe as follows:
21 "The current concern that there is a lack of
22 urgency in getting work done at NPGD and that
23 NPGD operates in an extremely relaxed mode giving
24 the appearance of a Country Club atmosphere."

25 Was the phrase "the appearance of a

Country Club atmosphere" something that had been used by Olds or Mr. MacMillan?

A I do not know the source of Mr. MacMillan's comments. On reflecting on this, having read this, I recall that there was a visit by Mr. MacMillan's boss that precipitated much of his concerns.

Q Is it your recollection that it was John MacMillan's boss who had characterized the atmosphere as a country club atmosphere?

A It vaguely seems to me that that was the source of this, these comments.

Q Who was MacMillan's boss in November of 1978?

A It escapes me at the moment. The company records -- it can be researched, and I just don't remember the man's name at the moment.

Q What did you understand was meant by the phrase "a Country Club atmosphere"?

A In writing the memorandum here to respond to these comments, there might have been a perception that there was no sense of urgency in the execution of the completion of the engineering work, purchasing work related to delivery of the

nuclear steam supply systems.

Q You wrote in response to items 2 and 3, "These two items are very, very closely related. It is my belief that they are caused by the continual slip in the schedules as related to the NSSS contracts."

When you used the word "they" in that sentence, "It is my belief that they are caused," the "they" referred to the lack of urgency and the country club atmosphere, is that right?

A Yes.

Q And this was your perception of what had caused those things to exist?

A This is my perception and suggested change.

MR. SELTZER: Instead of my going on to something new, why don't we break for today and resume tomorrow morning.

MR. WISE: That's fine. 9:30?

MR. SELTZER: 9:30 is fine.

(Time noted: 6:50 p.m.)

NORMAN S. ELLIOTT

Subscribed and sworn to before me this
day of , 1981.

CERTIFICATE

STATE OF NEW YORK)
) SS.
COUNTY OF NEW YORK)

I, CHARLES SHAPIRO, CSR,, a Notary
Public within and for the State of New York, do hereby
certify that the foregoing deposition of

NORMAN S. ELLIOTT was taken before me
on February 5, 1981;

That the said witness was duly sworn before
the commencement of his testimony and that the
within transcript is a true record of said testimony;

That I am not connected by blood or marriage
with any of the parties herein nor interested directly
or indirectly in the matter in controversy, nor am I
in the employ of any of the counsel.

IN WITNESS WHEREOF, I have hereunto set
my hand this 17th day of FEBRUARY, 1981.

Charles Shapiro
CHARLES SHAPIRO, CSR

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I N D E X

WITNESS

PAGE

Norman S. Elliott

3

E X H I B I T S

GPU

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