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PRESIDENT'S COMMISSION ON THE :  
ACCIDENT AT THREE MILE ISLAND :

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DEPOSITION of NUCLEAR REGULATORY COMMISSION  
by THOMAS TAMBLING, held at the offices of the President's  
Commission on the Accident at Three Mile Island, 2100 M  
Street, N.W., Washington, D.C., on the 13th day of July  
1979, commencing at 11:00 a.m., before Stephen McCrystal,  
Notary Public of the State of New York.

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

September 13, 1979

MEMORANDUM FOR: The Record

FROM: T. N. Tambling, Reactor Inspector

SUBJECT: TECHNICAL CORRECTIONS TO DEPOSITIONS OF NUCLEAR  
REGULATORY COMMISSION BY THOMAS N. TAMBLING, 7/13/79

Page 4, lines 9 and 10

Actually Davis Besse 1 is part owned by Toledo Edison Company and part by Cleveland Electric Illuminating Company. Toledo Edison is the sole operator.

Page 9, line 17

The current set point of pressurizer safety relief valve is 2435 psig.

Page 14, lines 6, 7, 8, 9, 10 and 11

The record shows the call from Davis Besse on September 25, 1977 (Sunday) was received by the duty officer. Tambling as cognizant individual for Davis-Besse returned the call to Davis Besse to get the specific details on the event of September 24, 1977. Tambling talked to both J. Evans, Section Superintendent and J. Willard, Shift Foreman.

Page 15, line 13 and 14

The record shows that Tambling also notified the duty officer and the Branch Chief on September 25, 1977.

Page 24, line 11

A check of a calendar for 1977 shows that September 24, 1977 was a Saturday, not a Friday.

Page 25, line 10

Sequoyah is owned by TVA, however, the NSSS is a Westinghouse design.

Page 95, line 23 and Page 96, line 6

The record and report number 50-346/77-31 show that the management meeting was held on October 27, 1977 not October 24, 1977.

Page 99, line 21, and Page 103, line 2

The record would indicate that telecon on December 20, 1978 to Toledo Edison Company did not include members of NRR. The telephone call with Toledo Edison Company that included NRR was made December 23, 1978.

Page 135, line 9

The actual month was September not December.

*T. N. Tambling*  
T. N. Tambling  
Reactor Inspector

- 1 -  
ERRATA SHEET

<u>Page, Line</u>	<u>Now Reads</u>	<u>Should Read</u>
2, 12	blank	also present part time
2, 14	blank	William Bland
4, 22	---to a Construction Branch,	---to a Construction Branch.
7, 10	---,who has a technical--	---,who has a technical <u>background</u>
15, 14	<u>Richar</u> Knop	<u>Richard</u> Knop
19, 18	<u>after</u> the primary --	the primary --
25, 10	<u>sequoia</u>	<u>Sequoyah</u>
27, 21	It was a <u>suggestion</u> with	It was a <u>discussion</u> with
28, 14	<u>ractor</u>	<u>reactor</u>
29, 4	the <u>temperature</u> ,	the <u>level</u> ,
30, 18	<u>awre</u>	<u>aware</u>
32, 13	at the <u>rate</u> of 1600	at the <u>pressure</u> of 1600
33, 11	level going up was expect,	level going up was <u>not</u> expected
35, 8	to secure, going	to secure, <u>to prevent</u> going
35, 9	off, when they	off <u>scale</u> , when they
38, 4	<u>reel</u>	<u>real</u>



ERRATA SHEET

<u>Page, Line</u>	<u>Now Reads</u>	<u>Should Read</u>
51, 2	setpoint <u>it</u>	setpoint <u>is</u>
52, 21	energized	<u>de</u> energized
52, 23	and the PORV being	and the <u>not</u> PORV being
53, 6	you have a monitor <u>in</u> the	you have a monitor <u>on</u> the
56, 8	to go on <u>to</u> safety	to go on <u>before the</u> safety
62, 11	NP 327716	NP 32-77-16
62, 13	NP 327716	NP 32-77-16
66, 10	available <u>at</u> B&W	available <u>from</u>
68, 19	designed <u>at</u> a 50 psi	designed <u>with</u> a 50 psi
72, 2	fuel <u>pens</u>	fuel <u>pins</u>
72, 21	<u>par</u> -100	<u>Part</u> 100
72, 23	<u>par</u> -100	<u>Part</u> 100
74, 24	a plant <u>can't</u> go	a plant <u>can</u> go
76, 7	and inquired their	and inquired <u>to</u> their
83, 4	but that <u>that</u>	but that
87, 10	actually inventory <u>pressure</u> can	actually <u>pressurize</u> inventory can
92, 6	<u>800</u> gpm	<u>2800</u> gpm
93, 14	<u>800</u> gpm	<u>2800</u> gpm

ERRATA SHEET

<u>Page, Line</u>	<u>Now Reads</u>	<u>Should Read</u>
97, 2	The first <u>critically</u>	The first <u>criticality</u>
97, 3	meeting took place	<u>The</u> meeting took place
97, 22	time control, <u>with</u> the	time control <u>were</u> the
98, 14	and <u>light enunciators</u>	and <u>lighted annunciators</u>
107, 4	pressurizer <u>level</u> valve,	pressurizer valve
109, 6	<u>Fort</u> Clinton	<u>Port</u> Clinton
109, 7	<u>Fort</u> Clinton	<u>Port</u> Clinton
114, 10	<u>Self</u> -addressed	<u>Things</u> addressed
116, 4	one basic that was not an <u>unresolved</u>	one basic that is was not an <u>unreviewed</u>
122, 5	<u>wuld</u>	<u>would</u>
125, 7	primarily <u>to</u> Joel	primary <u>by</u> Joel

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A P P E A R A N C E S :

NUCLEAR REGULATORY COMMISSION:

MARIAN MOE, ESQ.  
Attorney, Office of General Counsel  
United States Nuclear Regulatory Commission  
1717 H Street, N.W.  
Washington, D.C. 20055

PRESIDENT'S COMMISSION ON THREE MILE ISLAND:

GARY M. SIDELL, ESQ.  
Associate Counsel  
*also Present Part Time*

STANLEY HELFMAN, ESQ.  
Associate Counsel  
*William Bland.*

oOo

T H O M A S T A M B L I N G , having been  
first duly sworn by Gary M. Sidell, Esq., was  
examined and testified as follows:

DIRECT EXAMINATION

BY MR. SIDELL:

Q Did you bring a resume, a brief summary of  
your background?

A Right. This is all from memory, so the dates may  
be off a little bit. I did not have access to my records,

1

2 being at the plant.

3

Q Have you ever had your deposition previously  
4 taken?

5

A No.

6

Q Let me briefly then explain the way we are  
7 going to run this. If you are unsure at all of any of  
8 my questions, please stop me and ask for a clarification,  
9 and I will try and explain what I am looking for in the  
10 way of information.

11

In view of the fact that when the deposition is  
12 transcribed it will be presented to you, and you will  
13 have an opportunity to then make changes or corrections  
14 in what is transcribed, we will also have an opportunity  
15 to comment on any changes we may feel are significant,  
16 and that may affect your credibility. Therefore, it is  
17 most important to be as precise and accurate in your  
18 answers now as you can be.

19

Please answer all questions audibly, without  
20 gestures, so the reporter can take them all down. And  
21 wait until I am finished with a question before responding  
22 because, obviously, he can't take down two people speaking  
23 at the same time.

24

MR. SIDELL: Let's have this summary of  
25 Mr. Tambling's background marked as Exhibit 1

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to this deposition.

(Above-described document was marked  
Tambling Deposition Exhibit 1 for identification,  
this date.)

Q What are your current responsibilities  
with the NRC in Region 3, Mr. Tambling?

A Currently the project inspector for Davis-Besse 1.

Q That is the utility owned by Toledo Edison?

A That is correct.

Q What precisely are your responsibilities as  
project manager for that plant?

A Project inspector.

Basically, to run the inspection program as out-  
lined by our office, responsibility to see that the  
various phases of it are accomplished based upon a  
given schedule, and also involved in doing some of the  
inspections myself.

Our office is set up that we have various support  
groups. We have, within our branch, a Nuclear Support.  
We have what they call supposedly "experts" in various  
areas, and then we have access to a Construction Branch  
people for their expertise in those areas. We have  
another branch that has expertise in radiation protec-  
tion, environmental protection.

1

2 I do not coordinate the security inspections.

3 That is handled by another group.

4 But all the other phases -- I am responsible for  
 5 coordinating and ensuring the inspection program. Then  
 6 I am also responsible for reviewing all the licensee  
 7 event reports that come out, making sure that all --  
 8 any open items are eventually closed out and keeping  
 9 records on that. I keep the project file up-to-date,  
 10 as far as the technical specifications. I read all  
 11 the submittals by the licensee that come through our  
 12 office and make a determination as to whether or not  
 13 any action is required by the Region.

14 Q - You mentioned that occasionally you were  
 15 personally involved in investigations. Would that be --

16 A No, I don't believe -- well, I didn't think I  
 17 said that.

18 MS. MOE: I believe he said that he did  
 19 some inspections.

20 A (Continuing.) Inspections, right.

21 Now, I have been involved, at Davis-Besse I was  
 22 involved in investigation of an allegation.

23 Q What was the allegation?

24 A There was an employee of Davis-Besse that contacted  
 25 one of the local TV stations in Toledo and said that the

1  
2 licensee knew about a problem before it developed.

3 Q What was the problem?

4 A The problem was associated with, as I recall,  
5 they had a problem with their safety feature actuation  
6 system; they had design and wiring problems. And I  
7 participated in that investigation. This was in June  
8 of 1978 -- I am not sure of the exact date that the  
9 investigation was carried out, but the problem developed  
10 in June of 1978.

11 Q The report of the alleged problem was made  
12 to the TV station in June of 1978, give or take a week  
13 or a month or so?

14 A Yes. The individual remained anonymous; he  
15 wouldn't tell the TV news reporter his name. We even-  
16 tually were able to make telephone contact with him,  
17 and he would not identify himself, so officially we  
18 don't have his name. I have a fairly good idea who it was.

19 Q Who was it, do you think?

20 A It was a reactor operator.

21 Q Currently employed at Davis-Besse?

22 A Yes, still employed, but not as a reactor operator  
23 now.

24

25



1  
2 Q So is it fair to say that you very rarely  
3 are involved in investigations at Davis-Besse?

4 A That was the first one at Davis-Besse. I had  
5 been involved in one previously at Zion, where I had  
6 been project inspector.

7 Q So it was the exception rather than the  
8 rule that you get involved in an investigation?

9 A Directly. If it is an outside allegation, I  
10 participate, like your friend here, who has a technical--<sup>(background)</sup>  
11 We have an investigative group that do investigations.  
12 We go along as more or less from a technical advisor  
13 standpoint.

14 Q. You also mentioned, I believe, that one  
15 of your responsibilities is to ensure that open items  
16 found during inspections are eventually closed out; is  
17 that correct?

18 A I keep what they call an open items list. These  
19 are taken off of the reports.

20 Q What is the general time within which an  
21 open item must be closed or resolved in order for it  
22 to be considered a timely resolution?

23 A I don't know of any specific time frame require-  
24 ment on that, just generally that the more significant  
25 ones are closed out immediately. Our general guidelines

1  
2 are to, if you run across a safety problem at the site,  
3 that you get some type of resolution, what the corrective  
4 action would be, before you leave.

5 Q So it is a same-day resolution for important  
6 matters?

7 A Same day or -- it may not get closed out in the  
8 report; you know, the corrective action can take any  
9 place from one day to several months or even years to  
10 implement.

11 Q But nevertheless a decision is made rela-  
12 tively shortly after the problem is noticed on what the  
13 corrective procedures will be; is that fair?

14 A I would like to qualify that from the standpoint  
15 that it depends upon what we would conclude would be  
16 the safety significance of it.

17 Q Well, for example, if you have a problem --  
18 let's talk hypothetically for a minute -- with a PORV  
19 situation that does not properly close, and you or  
20 someone in Region 3 is made aware of that problem, you  
21 have informed the licensee what the problem is and  
22 what you think should be done about it, yet 18 months  
23 later this same problem still exists. Would you  
24 consider that a timely resolution of a safety problem,  
25 given the importance that a PORV plays in the operation

1 of a nuclear reactor?

2 A A PORV is not a safety-related valve.

3 Q What is the purpose of a PORV?

4 A ,Primarily, it is to prevent the actuation of the--  
5 if you are talking about the PORV of the pressurizers,  
6 it is to prevent the operation of the pressurizer safety  
7 valves.

8 Q Currently?

9 A Currently and -- yes.

10 Q What is the setpoint on the PORV currently  
11 at Davis-Besse?

12 A At Davis-Besse, I think it is something like  
13 2355 psig.

14 Q What is the setpoint on the safety valves  
15 currently at Davis-Bessè?

16 A 2435 -- I'm sorry, 2455.

17 Now, in answer to your original question, I wanted  
18 to qualify it. When I said that, you know, it is not a  
19 safety-related valve, yes, if the valve problems weren't  
20 corrected in 18 months, I would say that was an untimely  
21 resolution.

22 Q That was untimely; is that your response?

23 A Yes.

24 Q So for example, if we have a problem that

2 was more important or more safety-related, if I can  
3 use the term, than a PORV problem, a time period of  
4 less than 18 months would be required to resolve the  
5 problem in a timely fashion?

6 A Yes.

7 Now, the event or the PORV problem at Davis-Besse  
8 that was -- we had set the requirement that that valve  
9 problem be corrected prior to operation, and the valve  
10 was repaired and retested, and when the retesting  
11 resulted in another failure, verified that the thing  
12 was repaired and design modification was made to it  
13 prior to their operation.

14 Q In general terms, can you describe the  
15 procedure in Region 3 as you are involved in it for  
16 reporting a safety problem at -- let's use Davis-Besse --  
17 to Region 3, and if it is serious enough, where else  
18 does it go -- you, or someone else in Region 3, uncovers  
19 a safety problem at Davis-Besse, what happens? Is a  
20 report filed? If so, where does it go? What happens  
21 to it?

22 A Well, you can make an inspection. If you uncover,  
23 as a result of various mechanisms of uncovering a safety  
24 problem, inspection is made of it. The findings then  
25 are documented in an inspection report. Our checklist

1  
2 includes trying to determine whether it has a generic  
3 implication at the site or whether it has a generic  
4 implication within the industry.

5 Q Can you tell me how you are using the two  
6 terms, "generic at the site" and "generic in the  
7 industry"?

8 A Well, let's say we have a valve problem, and  
9 the site has 25 of these same type valves, all right?

10 Q So if you have a problem with one valve at  
11 this particular site, "generic to the site" might be  
12 a problem with all 25?

13 A Right.

14 Q And "generic to the industry" is all plants  
15 of the same manufacture experiencing the problem?

16 A Possibly, or whether, let's say, this particular  
17 valve problem, you know, that it is being used at  
18 other plants.

19 Q Is it merely by definition at more than  
20 one plant to be generic?

21 A Usually. Normally if it is found that it only  
22 exists at one other plant, then it is handled on an  
23 individual basis, one or two. If it is generic across  
24 the industry, then some mechanism, a bulletin or  
25 circular or information letter, is put out on it.

1

2 Q How about the publication entitled "Current  
3 Events Power Reactors," published by the United States  
4 Nuclear Regulatory Commission? I will show you a copy  
5 which has been previously marked as Exhibit 5 to the  
6 Creswell Deposition, and ask you whether or not you  
7 have ever seen that publication.

8 A I have seen the Current Events publication. I  
9 wouldn't say that I have seen particularly this one.

10 Q Would that publication generally be within  
11 the range that you have previously mentioned of identi-  
12 fying generic problems to the industry?

13 A This is one method of disseminating information  
14 to the industry.

15 My understanding of this thing is these are taken  
16 by an office within the NRC as a result of reviewing  
17 the LERs that are submitted and/or reviewing the docu-  
18 mentation reports, things that come in.

19 Q Someone here in Washington at the NRC looks  
20 over the LERs from the various regions and determines  
21 what it deems to be important and puts them in a  
22 Current Events publication that is sent out to all  
23 power reactors?

24 A Yes.

25 Q So, for instance, if you had a problem of

1  
2 one form or another at Davis-Besse, shortly after the  
3 problem occurred, if someone at Washington felt it was  
4 sufficiently important, that it would be disseminated  
5 to all other nuclear power reactors in the country?

6 A These are sent out as information. There is no  
7 requirement of the licensee to, you know, review them  
8 or act upon them.

9 Q But they are sent to licensees, are they not?

10 A I have seen these things in the hands of  
11 licensees, yes.

12 Q We understand that there was, to a degree,  
13 a problem at the Davis-Besse reactor on September 24,  
14 1977. Let me show you a letter addressed to Region 3,  
15 your attention, subject: "Reportable Occurrence," dated  
16 in handwriting. 9/26/77, sent by Jack Evans, station  
17 superintendent at Davis-Besse, which has been previously  
18 marked as Exhibit 5 to the Anderson Deposition, and  
19 ask you if you recall seeing that.

20 A Yes. I believe that was probably in my file.  
21 That is the standard requirement of the licensee's  
22 license on all reportable events classified as  
23 reportable. In addition to a telephone call, they  
24 make a followup with a written report, telegram or  
25 telecopy, within 24 hours.



1  
2 Q The last line of this Exhibit 5 to the  
3 Anderson Deposition states:

4 "Tom Tambling, NRC Region 3, telephoned at 10:30  
5 hours on September 25, 1977."

6 Do you recall receiving a telephone call approxi-  
7 mately that time of day?

8 A That is correct.

9 Q Who called you, if you remember?

10 A I would have to really go to my records on that,  
11 but I believe it was Jack Evans that called me.

12 Q Are these personal records that you keep  
13 about your function at Davis-Besse?

14 A We have -- we fill out what we call a screening  
15 and evaluation sheet when we receive a call on reportable  
16 events. On that I usually document whom I receive the  
17 call from, the time, the date, the subject. Then we  
18 normally prepare 24-hour notification reports, write  
19 up a brief description of what happened, and that is  
20 submitted as a morning report, which goes in to our  
21 headquarters.

22 Q But you are not referring to any personal  
23 notes you may have kept during this time, merely forms  
24 required by the NRC to be completed and forwarded?

25 A Yes. I do not have the documentation in front

1 of me, so I, you know --

2 Q This report, Exhibit 5 to the Anderson  
3 Deposition, does not appear to mention how the HPI  
4 system was terminated, does it?

5 A No, it does not.

6 Q Did you consider that a relatively important  
7 safety situation when you received this report?

8 A Yes.

9 Q What did you do when you received it?

10 A Notified my supervision.

11 Q Who might that be?

12 A That was -- my section head at that time was  
13 *Richard*  
14 ~~Richard~~ Knop.

15 Q He is located in Chicago?

16 A Yes.

17 Q Was this in writing that you notified him?

18 A Normally it is as soon as we get these things, we  
19 go down and talk with him.

20 Q Is that what you did in this instance, do  
21 you recall?

22 A To the best of my knowledge, I did, yes.

23 Q Did you memorialize that meeting in any  
24 document you may have prepared subsequently?

25 A No. It is not normal. That is a responsibility

1  
2 of the project inspector, to keep his management aware  
3 of any significant developments.

4 Q What was Mr. Knop's reaction to this report?  
5 Did he consider this a substantial safety problem?

6 A Yes, and he made arrangements to have an inspector  
7 sent to the site the following Monday. The plant was  
8 in shutdown at the time.

9 Q Had you previously seen an increasing  
10 pressurizer level at Davis-Besse?

11 A At the time?

12 Q Prior to this instance?

13 A No.

14 Q Do any of the tech specs deal with an  
15 increasing pressurizer level at Davis-Besse, to your  
16 knowledge?

17 A No, they do not.

18 Q Would you characterize an increasing  
19 pressurizer level as a rather unusual or exceptional  
20 occurrence?

21 A It depends upon the situation. If you have a  
22 trip on the secondary side, you are going to get a swell  
23 in the primary system, and the pressurizer level is  
24 going to go up.

25 Q Let's take it from the perspective that you

1  
2 have a problem in the primary system. Would you  
3 normally expect a pressurizer level increase?

4 A If you have a leak in the primary system, the  
5 level would normally go down. As soon as you trip the  
6 reactor, the level goes down from the cooldown of the  
7 primary system; you have shrinkage.

8 Q Well, in Exhibit 5 to the Anderson Deposition,  
9 which you have in front of you, the third sentence in  
10 the first paragraph states:

11 "Unknown to the operator, the electromatic relief  
12 valve failed to reclose, resulting in a decrease of  
13 RCS pressure and resultant SFAS actuation at 1600 psig."

14 First of all, let's determine that "electromatic  
15 relief" is the same thing as PORV or pilot-operated  
16 relief valve; is that true?

17 A Right.

18 Q So we have established, if this report is  
19 correct, that you had a primary system leak, a LOCA;  
20 is that correct, the PORV failing to close?

21 A Yes.

22 Q In that situation, you would not expect  
23 the pressurizer level to increase, would you?

24 A Primary function initially, as you have your  
25 depressurization, your cooldown, is for the pressurizer

1  
2 level to shrink and go down. As you bring on the pumps,  
3 the high-pressure injection pumps, and you also restarted  
4 the makeup pumps, in this event you would expect  
5 eventually to recover the level that you lost due to  
6 shrinkage.

7 In this particular case, your LOCA was off the  
8 top of the pressurizer, so that is basically your high  
9 point in your system -- one of your highest points in  
10 your system, these valves. So you should expect -- you  
11 were pumping in all this water, so the level should  
12 start to come back up.

13 Q But initially on the occurrence of the PORV  
14 sticking open, the pressurizer level indication should  
15 decrease, should it not?

16 A Yes.

17 Q Indicating a decrease in coolant in the  
18 primary system?

19 A Change in inventory, not necessarily -- I mean  
20 change in volume, not necessarily a change in mass.

21 Q Essentially in layman's terms, that would  
22 mean the water in the reactor core is dropping; is that  
23 essentially correct, if you have a LOCA?

24 A No. It depends again where the LOCA is. You  
25 can still keep your core flooded; you can have a drop

1  
2 in level -- that is the primary reason for the  
3 pressurizer, is to handle surges, changes in the system  
4 volume.

5 Q But in this situation, September 24, 1977  
6 at Davis-Besse, the PORV sticks open, you are losing  
7 pressure in the primary system, correct?

8 A That's right.

9 Q And as a result, the inventory in the primary  
10 system should be decreasing, not necessarily uncovering  
11 the core, but just tending in that direction; is that  
12 true?

13 A You are losing inventory through the steam that  
14 you are discharging through the relief valve. You  
15 are losing volume due to the decrease in temperature  
16 in the primary system. As the reactor is tripped, you  
17 have lost your major heat source; you are still cooling  
18 ~~the~~ the primary system by your steam generator, so  
19 you had a cooldown in temperature; you have a shrinkage  
20 in volume but you are losing mass through the open  
21 pressure relief valve primarily at this point in the  
22 form of steam.

23 Q So we are tending to uncover the core in  
24 this situation, not uncovering it but tending in that  
25 direction, reducing the water level in the reactor



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core itself?

A Basically, if you can keep water and pressure in the pressurizer, you should never uncover the core.

Q I understand that, but prior to the initiation of the HPI system or any makeup pumps immediately when the PORV sticks open, the first event as a result of that situation is to tend toward uncovering the core, not uncovering it but just tending in that direction.

Is that an accurate statement, prior to any makeup pump or HPI system initiation to replenish the core inventory? I realize this is essentially a circle, and depending on where you cut the circle affects the answer, but prior to any replenishment of core inventory, is not the case a situation where the inventory is dropping as a result of this particular LOCA?

A You have loss of inventory. If the loss of inventory is unchecked and you have no makeup into the primary system, yes, you are going towards or tending towards uncovering the core.

(Continued on Page 21.)



1  
2 Q And at that time when you reached 1600 psi,  
3 the HPI system is actuated replenishing and therefore  
4 tending away from core uncovering; is that correct?

5 A Yes.

6 Q What did Mr. Knop do, if anything, that you  
7 know of, once you relayed the September 24, 1977  
8 situation at Davis-Besse?

9 A I don't remember the specific details at that  
10 particular time. The best I can do is speculate as  
11 to what went on.

12 Q Would you speculate then, please, based on  
13 your experience for some years working for the NRC in  
14 Region III?

15 A Normally I would discuss with him the problem,  
16 made sure that he understood it, determine, you know,  
17 what the licensee's intentions are. At that time I  
18 would speculate that we verified that the licensee was  
19 going to stay down, you know, reactor, take it down to  
20 cold shutdown and determine what the problem was. I  
21 would speculate at that time that we discussed whether  
22 or not -- I was scheduled to go to a training program  
23 the following week -- whether I should cancel out on  
24 that or was there another inspector available to go to  
25 the site, and since I went to the training program the

1  
2 next week, I would say that the decision was that there  
3 was another inspector available and arrangements were  
4 made for him to go to the site the following Monday.

5 Q Am I correct in concluding that this is  
6 the first occurrence at Davis-Besse of a pressurizer  
7 level indication going high during a transient, to the  
8 best of your knowledge?

9 A To the best of my knowledge, this was the first  
10 transient at Davis-Besse.

11 Q So it was nevertheless the first time the  
12 pressurizer level indication went high as well?

13 A Yes.

14 Q Were you aware of pressurizer level indica-  
15 tion going off scale high at any other B&W plant up  
16 until September 24, 1977?

17 A No, I was not.

18 Q Would you consider that a relatively  
19 significant situation during a transient to have the  
20 pressurizer level indication go off scale high?

21 A For this type of event, the LOCA, with the PORV  
22 failing open, yes. There are other transients in  
23 which the levels do go high though.

24 Q Do you receive a copy of the Current Events  
25 Power Reactor circular that I showed you previously

1  
2 which has been marked as Exhibit 5 to the Creswell  
3 deposition? Do you get a copy of this as well as the  
4 licensees?

5 A I have, in my files, some of these. I don't know  
6 whether I particularly have this one or not.

7 Q Is it your general practice to review those  
8 upon receipt in your office?

9 A I attempt to read them, yes.

10 Q So if, up until September 24, 1977, any  
11 other B&W reactor in the country experienced a loss of  
12 pressurizer level indication high, a similar circumstance  
13 as to what occurred at Davis-Besse on September 24, they  
14 more than likely would have found their way into one  
15 of these Current Event Power Reactor circulars?

16 A They may have. I do not recall ever reading  
17 about one.

18 Q So if someone in Washington concluded they  
19 were sufficiently important to include in here, you  
20 don't recall ever reviewing that?

21 A No.

22 Q Was Mr. Knop concerned about the September 24,  
23 1977 transient at Davis-Besse because at least in part  
24 the pressurizer level indication was off scale high?

25 A At that point we did not know the pressurizer

1  
2 level had gone off.

3 Q When did you first learn that?

4 A I believe they did not find that out until after  
5 the inspector went out to the site.

6 Q Do you know when that was?

7 A To the best of my knowledge, that was the following  
8 Monday.

9 Q Do you happen to recall what day of the  
10 week September 24, 1977 was?

11 A It was a Friday.

12 Q So three days later you knew that the  
13 pressurizer level indication was off scale high?

14 A I will say it was three days later. It could  
15 have been Monday or Tuesday, you know.

16 Q A matter of within a week after the transient?

17 A Yes.

18 Q And that was after you had originally spoken  
19 with Mr. Knop; is that correct?

20 A Yes.

21 Q Did you have occasion to speak with him  
22 again upon learning of the loss of pressurizer level  
23 off scale high?

24 A No. I think I told you that I had gone to the  
25 simulator course that following week and another

## Tambling

1  
2 inspector was sent to the site.

3 Q Who was the inspector at the site at that  
4 time?

5 A It was Terry Harpster.

6 Q He is usually in Region III as well?

7 A Yes.

8 Q Was the simulator training course that you  
9 went to at the B&W facility at Lynchburg?

10 A No, it was in Westinghouse's <sup>Sagoyah</sup> ~~Sequoia~~ plant at  
11 Chattanooga, Tennessee.

12 Q Do you have Westinghouse plants that are  
13 included in your responsibilities of inspection?

14 A If you read my resume, that was what I had prior  
15 to Davis-Besse. It was Zion, which was a Westinghouse  
16 plant.

17 Q But at the time you attended the training  
18 course, you were still employed full time at Davis-Besse;  
19 is that correct?

20 A That is correct.

21 Q Which is a B&W reactor?

22 A That is correct.

23 Q Did you have any plans in returning to  
24 Zion in the near future?

25 A No. The training program that they have for

1  
2 pressurizers within the NRC, the pressurizer reactors  
3 training program, is around the Westinghouse plant and  
4 the boiling water reactor school is structured around the  
5 GE plant.

6 Q So to use the industry terminology, if I may,  
7 training on a Westinghouse simulator was essentially  
8 generic to that type of reactor regardless of the  
9 manufacturer; is that correct?

10 A Those were the only two courses available at that  
11 time.

12 Q Are there more now that you know of?

13 A No, other than there is discussion about including  
14 a course on B&W plants and Combustion Engineering. They  
15 had sent a group of inspectors to the Lynchburg simulator,  
16 I believe, in 1973, of which there was one inspector in  
17 our office who went.

18 Q Do you know whether or not in the 1973  
19 training session any information was covered concerning  
20 loss of pressurizer level indication high?

21 A No, it was not included.

22 Q It was not covered?

23 A To the best of my knowledge, no. The Westinghouse  
24 plant does have an anticipatory trip on high level/low  
25 level pressurizer where B&W doesn't.

1

2 Q Do you know if it is possible to simulate  
3 the precise conditions that occurred at TMI 2 on  
4 March 28, 1979? In other words, is it within the  
5 capability of the simulator to recreate those condi-  
6 tions, if you know?

7 A I would prefer not to answer that because I would  
8 be guessing.

9 Q All right, fine.

10 When you returned from this week training  
11 course at the Westinghouse facility, were you again in  
12 contact with Mr. Knop concerning the September 24, 1977  
13 transient?

14 A Yes.

15 Q What did your contact include at that time?

16 A He was bringing me up-to-date on what had occurred  
17 during that ~~brief~~ previous week.

18 Q And in a brief summary, can you tell me  
19 what you learned from him?

20 A I find it difficult to recall specific details  
21 at this time, very difficult. It was a <sup>discussion</sup> ~~suggestion~~ with  
22 both him and Terry Harpster that went over what they  
23 found, what had been specified as the corrective action.

24 Q First of all, what was the primary problem  
25 they found causing the transient on September 24?



1  
2 A It was started by a half trip in the steam feeder  
3 water rupture control system which closed one of the  
4 start-up valves to one of the steam generators which  
5 caused a low level in the steam generator resulting in  
6 the full steam feed water rupture control trip. When  
7 that occurs, the system, the feedwater system isolates  
8 the generators and the auxiliary feedwater starts. The  
9 auxiliary feedwater came on and one of them didn't come  
10 on to full speed -- it stopped at 2600 rpm -- which it  
11 did not provide enough head to overcome the pressure  
12 that was in the steam generator, so you weren't getting  
13 feed to one steam generator. The loss of level in the  
14 steam generators, with the <sup>reactor</sup> reactor still running, resulted  
15 in the increase in primary system temperature. This  
16 caused the pressure to rise in the primary system and  
17 the opening of the pilot-operated relief valve. The  
18 valve cycled a number of times -- the estimated number,  
19 I believe, was nine.

20 Q Do you have reason to believe it was something  
21 other than nine?

22 A I have no reason to believe it was other than nine.  
23 The estimation was made off of reviewing the data that  
24 came off the reactimeter.

25 With the increasing level that you got, which is

1  
2 normal with the increase in temperature at that time  
3 in the pressurizer, going up, this initial increase in  
4 the <sup>level</sup> ~~temperature~~, the operator manually tripped the  
5 reactor.

6           The pressurizer relief valve failed open.  
7 The pressure started to decrease, the temperature  
8 started to decrease.

9           The pressure decreased to the setpoint of the  
10 safety feature actuation, 1600 pounds -- that is an  
11 approximate number -- at which time the HPI pumps came  
12 on.

13           The operators, at this time, also blocked the  
14 output modules so that they could reestablish makeup  
15 pumps and start those. They started one and then a  
16 second makeup pump had been established, charging through  
17 those.

18           Q       At Davis-Besse are the makeup pumps different  
19 from the HPI pumps?

20           A       Yes.

21           Q       They are medium head pumps?

22           A       They are high head pumps.

23           Q       The makeup pumps are high head pumps?

24           A       Yes.

25           Q       The HPI system are also high head pumps,

2 are they not?

3 A Not like TMI. At TMI the makeup pumps and the  
4 HPI pumps are the same design. Davis-Besse has two  
5 makeup pumps which are not safety grade and their  
6 high pressure injection pumps are what you call an  
7 intermediate head pump, 1600 pounds versus 2700 pounds.

8 Q Are you aware of any other B&W facilities  
9 that have the exact reverse situation -- in other words,  
10 where the HPI pumps are high head pumps and makeup pumps  
11 are intermedidate head pumps, for instance, Zion?

12 A Zion has -- that is not a B&W plant -- but Zion  
13 has two safety grade charging pumps which are high head,  
14 2700-pound pumps. Then they have two what they call  
15 safety injection pumps, SI pumps, that are, I believe,  
16 about 1600 to 1700-pound head. Then they have the low  
17 pressure injection pumps which are 300 to 400-pound head.

18 Q Are you <sup>aware</sup> ~~awre~~ of any B&W plants that have  
19 HPI pumps with a higher head, more pressure, than makeup  
20 pumps?

21 A I believe all the other B&W pumps, makeup pumps  
22 and high injection pumps, are the same. Davis-Besse  
23 is the unique one having the low pressure injection  
24 pumps.

25 Q So at other B&W plants, "makeup pump" is

1  
2 merely another name for HPI pump?

3 A That is correct.

4 Q When you returned from your week training  
5 course and spoke with Mr. Knop, did he mention to you  
6 that there was loss of pressurizer level indication  
7 off scale high?

8 A I do not remember that being made a specific issue.

9 Q Do you recall or do you know whether or not  
10 Mr. Knop ever had information of loss of pressurizer  
11 level indication off scale high at a B&W plant prior to  
12 this incident at Davis-Besse?

13 A I have no knowledge of that.

14 Q So at this time, as far as you can recall,  
15 there was no point made by Mr. Knop to you of loss of  
16 pressurizer level indication off scale high, or if there  
17 was, you don't recall it?

18 A I don't recall it being made a special issue.

19 Q How about manual override of the HPI system?

20 A Repeat that, please?

21 Q Was there any mention made of a manual  
22 override for the HPI system at Davis-Besse during this  
23 transient?

24 A Yes, there was discussion of that. At the time  
25 it appeared it was reasonable and did not make, they

1  
2 did not see that as a particular problem.

3 Q Well, in the chronology of what happened,  
4 am I correct in concluding that the initial reaction  
5 of the pressurizer level indication was a drop with the  
6 HPI pumps on, and then a point of stabilization as far  
7 as the pressurizer level indication is concerned,  
8 followed by the HPI pumps being turned off; is that  
9 essentially correct?

10 A As I remember the situation, there was an initial  
11 rise in pressurizer level with the increasing temperature,  
12 and then the pressurizer level started to decrease with  
13 temperature and pressure. At the ~~rate~~<sup>pressure</sup> of 1600 pounds  
14 the pumps came on, pressurizer level continued to drop.  
15 They also started makeup pumps. The level started to  
16 come back on, backup, increasing, at which time the  
17 high pressure injection pumps were turned off.

18 My memory serves me that they still had on -- the  
19 makeup pumps were still on at the time.

20 Q Once the HPI system was turned off, did  
21 the pressurizer level indication go back up?

22 A It continued to rise.

23 Q Was that an expected occurrence?

24 A At that time I would have to say that I didn't  
25 really assess whether it was expected or not expected,

## Tambling

1  
2 you know. I expected the level to come up and did not  
3 make a specific, it did not trigger any specific problems  
4 at that time, or indicate any specific problem.

5 Q How about now looking back at it, would  
6 that have been the expected result for the pressurizer  
7 level indication to go off scale high after the HPI  
8 system was turned off?

9 A With the information that I have now and knowing  
10 that in all probability that the rate of increase of  
11 the pressurizer level going up was <sup>(not)</sup> expected, would be  
12 the result of voids forming in the primary system.

13 Q And you want to try to avoid voids forming  
14 in the primary system; is that true?

15 A Correct.

16 Q So based on what you now know, that was  
17 not the expected result, for the pressurizer level indi-  
18 cation to go off scale high once the HPI system was  
19 turned off?

20 A You expect the pressurizer level to come back.

21 Q But to stop on an indication, not to go off  
22 scale?

23 A Well, normally we don't let it go off scale.  
24 That is what the operators are trained to prevent, the  
25 pressurizer from going solid. When you start recovering



1 level and feeding water in there, I guess then what  
2 we did not assess was the rate at which it was  
3 increasing. You do expect the level to be recovered,  
4 but what I did not assess was the rate at which it was  
5 increasing. So I did expect the level to, you know,  
6 come back, but did not make an assessment of the rate  
7 at which the level was coming back.

9 Q But what actually happened exceeded your  
10 expectations in terms of level indication; is that  
11 correct? It went higher than you thought it would go,  
12 you didn't expect it to go off scale high?

13 A I have a problem right now in that you are asking  
14 me what I expected then, and I have learned something  
15 since and I can't really say what I expected then, you  
16 know.

17 Q What are the procedures employed at Davis-  
18 Besse dealing with when it is permissible for an operator  
19 to turn off the HPI system relative to the pressurizer  
20 level indication?

21 A There are procedures and the training up to that  
22 point was to, when you recover pressurizer level, you  
23 got back into the normal operating range, that the pumps  
24 could be secured.

25 Q A normal operating range does not include



1 off scale high?

2 A No, but I don't know -- I don't see the importance  
3 of that statement that you added on there, the signifi-  
4 cance of why you keep making that point about going off  
5 scale. The question was what were the instructions, the  
6 procedures and the instructions to the operators, and I  
7 said that -- the answer was basically to secure, <sup>to prevent</sup> going  
8 off <sup>scale</sup>, when they got back into operating range. Whether  
9 it goes off scale or not, securing the pumps, you secure  
10 the pumps before it got there.

11 Q So it shouldn't have gone off scale high?

12 A Normally it should not. You try to prevent that.

13 Q I believe in one of your previous answers  
14 you indicated that then the procedures were to wait  
15 until the pressurizer level indication got back to a  
16 normal range and then you shut off the HPI system; is  
17 that correct?

18 A Yes.

19 Q Has there been a change in the operator  
20 procedures as to when to turn off the HPI system at  
21 Davis-Besse?

22 A Yes.

23 Q When did that change occur?

24 A The first time or the second or third or fourth

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time?

Q Let's start with the first.

A I believe the first time was December 1978.

Q Was that as a result of a December 20, 1978 conference call between Toledo Edison and the NRR?

A I don't believe so. If you are referring to the discussion of the loss of pressurizer level conference call -- is that the one you are referring to?

Q I believe it occurred on December 20, 1978, between your office and NRR, several people involved.

A As I remember that conference call, it was not.

Q I think there were two or three conference calls the same day.

A That was on a different subject. That was on loss of pressurizer level.

I believe there were two reasons why that procedure was changed then. One was the result of a review by Mr. Creswell and Mr. Streeter, and the other was a request of mine based upon a request of our headquarters to review the resetting of these safety system features.

I had asked them, I believe, in October, to come up with a guidance for resetting their safety features actuation system.

Q The dual setpoint situation?

1  
2 A No, nothing to do with that.

3 Q At the time, September 1977, was there a  
4 wide range or narrow range pressurizer level indication?

5 A They have three level indications on the pressurizer,  
6 and I don't believe there is what you call a narrow range.  
7 They go from zero to 320 inches, something like that.  
8 I believe two of them are temperature compensated and  
9 one is not.

10 Q So as a result of the transient in September  
11 1977, you and Mr. Creswell and Mr. Streeter, in December  
12 of 1978, felt a change in operational procedures involving  
13 the HPI system was necessary; is that correct?

14 A Neither to the best of my knowledge, neither of  
15 them were the result of that event.

16 Q Were they a result of the November 29, 1977  
17 transient at Davis-Besse?

18 A To the best of my knowledge, they were not the  
19 result of that either.

20 Q What produced the change or the apparent  
21 feeling of necessity for change in the operating  
22 procedures at Davis-Besse?

23 A As I said, the region received a directive, what  
24 we would call a TI, temporary instruction, from I&E  
25 headquarters requesting the review of licensee's

1  
2 procedures to determine whether, what type of guidance  
3 was being provided for resetting ECCS actuations on  
4 which, whether you had a <sup>real</sup> ~~real~~ or a spurious one.

5 The primary thrust was the resetting if you had  
6 a spurious actuation. It was primarily the result  
7 of experiences on the Westinghouse plants, but it was  
8 being looked at across, at all plants.

9 I reviewed their procedures and made a request  
10 of them to strengthen their guidance for resetting their  
11 safety features actuation system.

12 I don't recall specifically whether it was  
13 Mr. Creswell or Mr. Streeter, in review of an emergency  
14 procedure, they had some concern about the guidance  
15 being presented in there for turning off the high  
16 pressure injection pumps.

17 Q Did you share that concern?

18 A Let's say I had read the procedure too and I had  
19 not identified it as a problem. They discussed the  
20 request with me at the time and I shared their request  
21 to go ahead and ask the licensee to change it.

22 Q But you didn't necessarily agree with their  
23 reading of the procedures and what was called for, when  
24 it would be satisfactory to safely turn off the HPI  
25 system?

1

2 A I had no problem with the strengthening of a  
3 procedure in a more conservative direction.

4 Q If there was no Creswell-Streeter suggestion  
5 along those lines, would you independently have suggested  
6 that procedure at that time?

7 A At that time? Possibly. I don't know the  
8 answer. I can't say.

9 When you read things and you review things,  
10 certain things trigger you differently. I can read  
11 a procedure one day and somebody else can read it the  
12 next day and find something different. It is a func-  
13 tion of what you are looking for at that time.

14 Q As of today, without Creswell-Streeter's  
15 suggestion to change the procedures, would you now  
16 independently suggest or concur in that change?

17 A Yes.

18 Q And you were first aware of this proposed  
19 operational change in December of 1978 or was that the  
20 date the procedures were actually implemented?

21 A As I remember best, that was when the first change  
22 was made.

23 Q How much before that time was the suggestion  
24 made to change the procedures, if you can recall?  
25 Was it a period of several months or several days?

1  
 2 A To the best of my knowledge, my inspection was  
 3 made on October of 1978 on this TI, and it was subsequent  
 4 to that that Streeter and Creswell also made their  
 5 comment. Sometime in that period, between December --  
 6 October and December.

7 Q So we are talking about a time period of  
 8 essentially six to eight weeks preceding the actual  
 9 implementation of the operational change when it was  
 10 first raised?

11 A Approximately. I would have to check my records  
 12 to verify that.

13 Q After your return from your week training  
 14 seminar at the Westinghouse facility, did you have  
 15 occasion to personally inspect the Davis-Besse September 24  
 16 transient?

17 A I participated in the follow-up and the review  
 18 of the corrective action that had been outlined, and  
 19 verified that it had been completed. I wrote the report.

20 Q But did you personally investigate at any  
 21 time the September 24 transient, or was this investigation  
 22 exclusively done by Mr. Harpster?

23 A No, it was not exclusively done by Mr. Harpster.

24 Q So you did participate to an extent?

25 A I think that the report includes all those people



1  
2 who participated in the inspection and who were  
3 contacted or were involved in it.

4 Q Let me show you a report dated November 22,  
5 1977 addressed to Toledo Edison, attention Mr. James  
6 S. Grant, from Gaston Fiorelli, Chief Reactor Operations  
7 and Nuclear Support Branch, and ask you whether or not  
8 you have previously seen this.

9 A I have previously seen this.

10 Q Is this the report you filed with reference  
11 to the September 24, 1977 Davis-Besse transient?

12 A That is correct.

13 MR. SIDELL: Let's have this marked as  
14 Exhibit 2 to the Tambling deposition.

15 (The above-described document was marked  
16 Tambling Exhibit 2 for identification, this date.)

17 Q With reference to Exhibit 2 to this deposi-  
18 tion, your inspection report, the first line of the  
19 cover letter dated November 22, 1977 states, "This refers  
20 to the inspection conducted by Messrs. T. N. Tambling  
21 and T. L. Harpster of this office on September 26-30."

22 Is September 26 through 30th the week you  
23 were at the Westinghouse facility in the training  
24 seminar?

25 A Yes.



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Q So during that week only Mr. Harpster conducted the investigation; is that correct?

A No, I believe --

Q Between you and Mr. Harpster, only he was at the site during that week.

A Well, Mr. Little from our office was there on the 30th.

Q Is he an inspector?

A He is section head. He was Mr. Harpster's section head, plus these people from NRR.

Q Who are the people from NRR?

A Mr. Engle, Mr. Leung -- I have to attempt to pronounce Andy's name -- Szuklewicz, Mazetis, Rajan, Pittman, Plumber, and Denning.

Q All those people listed on Page 5 of Exhibit 2 are from NRR with the exception of Mr. Little?

A Right. Wait a minute, I better -- I don't know Pittman, Plumber, or Denning, so I better -- those names I am not familiar with.

Q Is the L. Engle referred to in Exhibit 2, Page 5, Leon Engle?

A Yes.

(Continued on Page 43.)

1 Q Do you know his position at NRR?

2 A He was project manager for Davis-Besse at that  
3 time.

4 Q We have at least six people listed here in  
5 addition to Mr. Harpster who were either from your  
6 office or from NRR, who were on the site September 30,  
7 1977. Is that a standard number of individuals investi-  
8 gating transients, as far as your experience goes?

9 A They came out to -- on September 30, there was a  
10 meeting held in which the licensee and B&W representa-  
11 tives discussed the events that occurred during the  
12 September 24th event.

13 Q So they were there for the purposes of the  
14 meeting and not necessarily inspecting the facility?

15 A Right.

16 Q Up until September 30, during that week,  
17 however, only Mr. Harpster was there investigating the  
18 transient on September 24; is that accurate?

19 A From our office, yes.

20 Q So when this letter, Exhibit 2 to this  
21 deposition, states that during the week of September 26  
22 through 30 both you and Mr. Harpster conducted an  
23 investigation at Davis-Besse, that is in error, isn't it?

24 A Well, that is the normal way in which we -- that

1  
2 is a standard boilerplate which we use in transmitting  
3 these letters.

4 Q But boilerplate or not, at least for that  
5 one week you were at a Westinghouse facility, not at  
6 the Davis-Besse site?

7 A That is correct.

8 Q October 5 through 7, that is part of the  
9 next week?

10 A Yes.

11 Q Were you on-site during October 5 through  
12 October 7?

13 A Yes. I believe that I was on-site then and  
14 the following days.

15 Q The following days are referred to as  
16 October 18 through 21st?

17 A Yes, and the 27th.

18 Q 1977.

19 And Page 4 of Exhibit 2, the inspectors listed  
20 are both you signing off on November 15, 1977 and  
21 Mr. Harpster signing off on this report on November 18,  
22 1977; is that correct?

23 A That is correct.

24 Q So that for the time that you were not  
25 at the Davis-Besse site, September 26 through 30, you

1

2 reviewed Mr. Harpster's activities and investigations  
3 and concurred with those actions?

4 A Yes.

5 Q Did you review his entire work involved  
6 with this investigation?

7 A He turned over his notes, what he had done and  
8 found. We went over where they were and what had  
9 been accomplished to date.

10 Q So your independent investigation was  
11 limited to the period of six days in October, October 5  
12 through 7, 18 through 21 and 27?

13 A Yes.

14 Q And who prepared this report, Exhibit 2 to  
15 this deposition?

16 A I prepared the report.

17 Q Mr. Harpster did not?

18 A He may have contributed parts of it. It was based  
19 upon both his notes and my notes, so I would have to  
20 say that he had a contribution into it. I believe most  
21 of the words in here are mine -- I mean the final  
22 writing of the thing.

23 Q But whatever he may have written, you  
24 reviewed?

25 A That's right.

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Q As submitted at that time, did you believe this report was complete and accurate concerning the facts stated in it?

A Yes.

Q Do you still believe that to be the case at this date?

A I have not gone back and reviewed the report as to whether it is.

Q Why don't you take a few minutes now to review it. Take a five-minute break, and you can review Exhibit 2.

A Any specific area?

Q Whatever you would like to review on it.  
(A brief recess was taken.)

MR. SIDELL: Back on the record.

Q Before our brief recess, Mr. Tambling, I asked you to take a look at what we have marked as Exhibit 2 to this deposition, correspondence dated November 22, 1977, addressed to Toledo Edison from Gaston Fiorelli. You have had a chance to look over the letter and the attached report?

A This letter?

Q Primarily the report is what I am interested in.

A I didn't really look at the letter. I was looking

1  
2 at the report. I got through Page 9.

3 Q Do you want to take some more time to  
4 finish that, or do you have a pretty good idea what  
5 is in the rest of it?

6 A If you want to stick to the report, I guess --  
7 I mean to the September 24th event, yes.

8 Q So you have had enough time to familiarize  
9 yourself with Exhibit 2.

10 I believe my question prior to the recess was  
11 whether or not today you felt this report was complete  
12 and accurate in the information it contained concerning  
13 the September 24, 1977 transient at Davis-Besse.

14 A Well, it was complete and accurate to the point  
15 of the information known at that time. I can see one  
16 situation where somebody maybe would take exception to  
17 a statement I have here.

18 Q Where would that be?

19 A Page 5.

20 Q Page 5 of Exhibit 2. Which paragraph?

21 A No, I'm sorry, I am going to the report number  
22 Page 5.

23 Q Yes. It says "21 hours 40 minutes 22 sec-  
24 onds." It is the third paragraph up from the bottom,  
25 Page 5.



1  
2 A I can see where somebody would take, I guess,  
3 exception to the use of the word "normal."

4 Q When you wrote this report in November of  
5 1977, how did you intend for the word "normal" that  
6 you have just referred to to be used, if you can recall  
7 at this time?

8 A I am not positive just how the intent of the  
9 word "normal" was, other than it was on-scale.

10 Q Any point on the pressurizer level indi-  
11 cation not off-scale high or low; is that a fair  
12 conclusion?

13 A Yes.

14 Q So with that one qualification, do you,  
15 at this date, believe that Exhibit 2, the report  
16 attached to it, was or currently is complete and  
17 accurate in the facts dealing with important matters  
18 of the September 24, 1977 Davis-Besse transient?

19 A To the best of my knowledge at this time from  
20 the cursory review, yes.

21 Q In your review of this report, Exhibit 2,  
22 with the one exception on Page 5 that you have just  
23 referred to, where "the HPI pumps were shut down at this  
24 time as pressurizer level was normal," is there any other  
25 reference to the HPI system in this report?



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2 A The fact that the safety features actuation system  
3 was initiated at 1600 pounds, that in itself implies  
4 that the HPIs came on because that is the initiating  
5 signal for them.

6 Q Is there any statement in this report,  
7 Exhibit 2, dealing with the operator turning off the  
8 HPI system, with the exception of your original reference  
9 to the third paragraph from the bottom on Page 5?

10 A I don't recall any other statement.

11 Q Is there any other indication in this  
12 report, Exhibit 2, which deals with loss of pressurizer  
13 level indication off the high end of the scale?

14 A I do not believe there is.

15 Q Is there any indication in this report,  
16 Exhibit 2, that deals with the problem of the PORV  
17 sticking in an open position?

18 A Yes.

19 Q Where would that be?

20 A Well, it is on Page 5 of the report, the block  
21 valve for the pressurizer relief valve was closed.

22 Q Which paragraph are you referring to?

23 A The last paragraph, Page 5 of the report, and  
24 also on Page 8.

25 Q Before we get to Page 8, Mr. Tambling, the

1  
2 sentence I believe you just referred to on Page 5 of  
3 Exhibit 2 states:

4 "The block valve for the failed electromatic  
5 pressurizer relief valve was closed approximately 20  
6 minutes after the start of the incident."

7 Is the block valve part of the PORV or the  
8 electromatic pressurizer relief valve?

9 A It is the valve that isolates the PORV.

10 Q So that block valve is located between the  
11 pressurizer and the PORV: is that correct?

12 A That is correct.

13 Q But that sentence does not emphasize the  
14 problem of the PORV itself remaining open, does it?

15 A All right, then, on Page 4 there is a discussion--

16 Q That is the second paragraph from the  
17 bottom of Page 4?

18 A Yes.

19 Q Let me back up for just a minute,  
20 Mr. Tambling. I note in the second paragraph from  
21 the bottom on Page 5 of Exhibit 2, there is a reference  
22 to the setpoint for the PORV of 2255 psi.

23 A That is correct.

24 Q I believe earlier in this deposition you  
25 indicated the setpoint for the PORV was 2355 psi.

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A You asked what the current setpoint ~~it~~.

Q That's right. So it previously was 2255 at Davis-Besse, and now it is 2355 psi?

A Yes.

Q What is "galling of the stem" of the PORV?

A It whenever you roll back little bits of metal off the surface of the stem.

Q Is it comparable to peeling a carrot?

A Yes, but usually not to that extent.

Q Much finer pieces of metal?

A Yes, either that or rubbing marks. You know, it is a change from a nice smooth surface to one that is rough.

Q Aside from the two paragraphs that you have referred to, the last paragraph on Page 5 and the second to the last paragraph on Page 5 of Exhibit 2, is there any other reference to specifically a problem of the PORV failing in an open position?

A I would say on Page 8 there is a discussion. There is discussion of the problem, what the corrective action that the licensee took.

Q That corrective action was to install a position indicator light concerning whether or not the PORV solenoid was actuated?

1

2 A Whether it had power to it.

3 Q But that does not indicate, does it, whether  
4 or not the PORV was open or closed?

5 A The valve itself, no. The valve itself is not  
6 designed, readily designed to put any position indi-  
7 cator on it. The only way you can put a position  
8 indicator on it is the power-operated solenoid, and  
9 they installed a light plus they put switches on the  
10 linkage of the pilot-operated relief valve itself.

11 Q What do the switches on the PORV do?

12 A It is on the pilot valve itself and not on the  
13 PORV, and all they do is tell you whether that solenoid  
14 is open or closed.

15 Q The switch is on the pilot valve? Is that  
16 a reference to something in the control room?

17 A The indications are in the control room, and the  
18 valve itself.

19 Q So it would be entirely possible that you  
20 would have a positive signal where the solenoid was  
21 <sup>de</sup>energized but where the PORV itself was open?

22 A The pilot indications could indicate that the  
23 pilot was closed and the <sup>NOT</sup>PORV being open.

24 Q And given that situation, there would be  
25 no other way to determine whether the PORV itself was

1  
2 open or closed?

3 A No, there are other indications that you can use.

4 Q What are they?

5 A Well, in the discharge to the quench tank you  
6 have a temperature monitor, you have a monitor <sup>on</sup> ~~in~~ the  
7 pressure and the level in the quench tank. Both of  
8 these can give you indication that the valve is open.

9 Q Is the quench tank also referred to as the  
10 drain tank?

11 A At TMI, it is referred to as the drain tank,  
12 reactor drain tank. At Davis-Besse, it is called a  
13 quench tank.

14 Q So the alternative way that you would  
15 determine that the PORV is in a failed open situation  
16 was by an increase in the escape of pressure from the  
17 primary system into the quench tank or a drain tank?

18 A Yes.

19 Q But there is no other more directly related  
20 method to determine the PORV has failed open, is there?  
21 You would have to do it by indirection?

22 A That is correct.

23 Q Do you think it would be possible from  
24 either an engineering or design perspective to install  
25 some form of monitor to indicate the actual position

1  
2 of the PORV itself on a B&W reactor?

3 A Why don't you say "all reactors"?

4 Q All right, all reactors.

5 A Well, I suppose it is possible. Anything is  
6 possible.

7 Q Well, would it be possible, would you say,  
8 an expenditure on the order of a million dollars?

9 A I think you have to ask that question of a valve  
10 expert. I don't profess to be a valve expert. I have  
11 no idea what the development costs would be.

12 Q But the PORV is a relatively small part  
13 of the entire nuclear plant system, is it not?

14 A Yes.

15 Q So aside from your qualification of non-  
16 expertise in design areas, it would not appear as though  
17 it would be an exorbitant sum of money to put in an  
18 indicator of that nature, would it?

19 A It would take a redesign of the valve itself,  
20 and I am not sure just what the design problems would  
21 be. One of the things that you are concerned with, of  
22 course, is to try to minimize the leakage from these  
23 things, and by having some type of external indicator  
24 or internal indicator, you have got problems of  
25 temperature and pressure and leakage that you would



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have to overcome, plus your reliability.

Q But in view of the fact that this PORV at Davis-Besse has failed not once but twice in an open position, it would not seem as though this was a minor problem, would it?

A It has been called on -- it has been operated a number of times subsequent to this thing and it has not failed. I don't have the actual numbers, but I think it is a reasonable number that vindicated that the problem, their specific problem, has seemed to have been corrected.

Q On Page 8 of Exhibit 2, there is a section entitled "3. Reactor Coolant System Depressurization." Would you take a look at that section for a second, please.

A Yes.

Q There is a reference in the third sentence concerning the electromatic relief valve, or the PORV, as we are referring to it now, and the design capability of the system without damage to equipment. At this time, do you believe that the operation or the tripping of the PORV might be characterized as an operational inconvenience alone?

A Do I believe that at this time?



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2 Q Yes.

3 A The tripping of it or the opening of it, if it  
4 performs correctly, is no problem. It is doing its  
5 design function.

6 Q What is that design function?

7 A To prevent, as I said before, to prevent the  
8 operation of the safeties, to go on <sup>before the</sup> to safety valves.

9 Q In other words, in layman's language, the  
10 reactor will not shut down when the PORV trips because  
11 the safety valves are still closed; is that essentially  
12 what happens in that situation?

13 A Not any more, because the high-pressure setpoint  
14 has been set below the PORV setpoint now.

15 Q I believe you indicated previously in this  
16 deposition that the setpoint on the safety valves is  
17 2455 psi currently.

18 A That is correct, but you didn't ask me what the  
19 setpoint of the high-pressure trip was.

20 Q Well, the current setpoint on the PORV is  
21 2355 psi; is that correct, 100 pounds per square inch  
22 less than the safety valve setpoint?

23 A I believe that is correct.

24 Q What is the trip point?

25 A 2300 pounds. So the reactor will trip on a high

1  
2 pressure prior to the opening of the PORV.

3 Q So essentially you are bypassing both  
4 safety valves and the PORV currently?

5 A What they are attempting to do is to minimize  
6 the operation of these valves, PORVs, and the safeties.

7 Q Why was that felt necessary?

8 A Well, as I understand the reason for this  
9 is that if you can trip the reactor at a lower pressure  
10 and not cause the safety valves to be called upon, that  
11 you increase the reliability of the whole operation  
12 from the standpoint, if the valves don't open, then you  
13 don't have to worry about them failing open.

14 Q So the reliability aspect is which,  
15 operational or safety-related?

16 A Well, it is safety-related, basically.

17 Q It is better to have the plant trip and  
18 find out what the problem is than to have a problem  
19 with a reactor still in a hot state?

20 A This is based upon the analysis of study groups  
21 that have looked into this; this is not based upon my  
22 analysis. In other words, this was the directive that  
23 came out as a result of Bulletins 79-05A and B, and  
24 the order. This was a result of the study done by  
25 people in NRR and I&E headquarters.

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2 Q Do you know when those studies were done?

3 A They have been in progress ever since the first  
4 of April.

5 Q Of 1979?

6 A Yes. These were directives to the licensee.

7 Q Do you know who at NRR was involved in  
8 the study?

9 A No. I can't give specific names. I have had  
10 so many task groups that informed -- I do know there  
11 are specific task groups to review it, but who specifi-  
12 cally made the decision, I can't say.

13 Q Do you know if Seymour Weiss was involved?

14 A He could have been.

15 Q Brian Grimes?

16 A Well, he could have been.

17 Q Do you know who at I&E was involved with  
18 these studies?

19 A Well, the bulletins came out of Ed Jordan's group.

20 Q That is I&E headquarters in Washington?

21 A Yes.

22 Q I believe before our break you indicated  
23 that you concluded that the problem of the PORV sticking  
24 open was safety-related, did you not?

25 A I said that the PORV is not a safety-related

1  
2 valve, in response to the question. We were concerned  
3 about the thing failing open, yes.

4 Q So it did have safety aspects to it if it  
5 failed in an open position?

6 A But the previous position on that, as I under-  
7 stand it, is that you have a block valve that you can  
8 close if the valve does fail open. The question is can  
9 you recognize, as you said, whether it has failed open.  
10 Therefore, your block valve becomes your point of safety.

11 Q As a result of the September 24, 1977  
12 failing open of the PORV at Davis-Besse, was there any  
13 specific report of that made to B&W?

14 A B&W was aware of it because they participated  
15 in that September 30 meeting. Although the meeting is  
16 not referenced, I guess, in the report, B&W was aware  
17 of it.

18 Of the B&W plants, Davis-Besse is the only one  
19 that has a Crosby design manufactured PORV. The other  
20 plants in the B&W system have other manufacturers. Most  
21 of them are Dresser valves.

22 Q What is the difference between the two  
23 designs, if you know that?

24 A I am not knowledgeable in the specific differences.  
25 As I understand, they are both pilot-operated relief

1  
2 valves, but I am not familiar with the specifics.

3 Q Do you know whether or not there is a  
4 substantial difference between the two valve designs?

5 A They are all designed on basically the same  
6 principles, but there are probably some unique features  
7 which I am not aware of right now.

8 Q But they would eventually function the same  
9 way?

10 A Basically. It depends a lot on the porting inside  
11 for relieving the pressure, so that the valve will open.

12 Q If you would, turn to Page 11 of Exhibit 2  
13 for a moment, please, with specific reference to Item 7,  
14 "Training and Retraining."

15 The paragraph mentions the training provided  
16 the operators of Davis-Besse as a result of the  
17 September 24, 1977 transient.

18 A Yes.

19 Q Were you involved in this training?

20 A I did not participate directly in the training.

21 Q Did you establish what matters would be  
22 considered in this training?

23 A I reviewed the information associated with it,  
24 what they were going to be telling them on the operation  
25 of the steam feedwater rupture control system.

1  
2 Q What information was that?

3 A That this was a description to make sure that  
4 the operating personnel understood the operation of it.  
5 What I specifically remember at this point is that  
6 these half-trips which got them into the problem were  
7 not fully understood.

8 Q Was there any discussion of manual override  
9 of the HPI system?

10 A Not to my knowledge.

11 Q Was there any discussion of loss of  
12 pressurizer level indication off the high end of the  
13 scale?

14 A I do not know. I can't recall that being  
15 discussed.

16 Q So at this point, as far as you know,  
17 there was no information about that?

18 A I do not remember.

19 Q One way or the other?

20 A One way or the other.

21 Q Can I conclude, then, by the description  
22 of the matters considered in the training session for  
23 Davis-Besse operators, that it was felt that there  
24 were sufficient operational procedures and information  
25 possessed by the operators concerning manual override



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2 of the HPI system not to require further instruction?

3 A There were verbal instructions, as I understand,  
4 on that. There were also instructions on what to  
5 look for as far as PORV failing open.

6 The content of that supplemental to the LER --  
7 most of these subjects were addressed with the operators--  
8 that was the other part of the training program, was  
9 going over the LER information.

10 I don't remember the number of the LER right  
11 offhand. I believe it was NP <sup>32-77-16</sup> 327716, was the number.  
12 It was a supplemental report written on that.

13 Q The original LER was numbered NP <sup>32-77-16</sup> 327716,  
14 as best you can recall?

15 A Is that the number?

16 Q Yes.

17 A Yes, all right, and there was a supplemental  
18 written to the original, and that was written at my  
19 request to summarize all the information.

20 Q Let me have you take a look at a  
21 report dated November 14, 1977 to Mr. James Keppler,  
22 Regional Director for Region 3 from Terry D. Murray,  
23 station superintendent at Davis-Besse, entitled "Supple-  
24 ment to Reportable Occurrence NP-32-77-16," and  
25 ask if you recognize that.

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2 A Yes.

3 MR. SIDELL: Let's have that marked as  
4 Exhibit 3 to this deposition.

5 (The above-described document was marked  
6 Tambling Deposition Exhibit 3 for identification,  
7 this date.)

8 Q What is this document, marked as Exhibit 3,  
9 Mr. Tambling?

10 A This is the Supplement to Reportable Occurrence  
11 NP 32-77-16, the date of occurrence, September 24,  
12 1977.

13 Q Did you prepare this report?

14 A I did not.

15 Q Do you know who did?

16 A It was prepared by station personnel, reviewed  
17 according to their own internal procedures for re-  
18 viewing these reports before they are submitted to  
19 the NRC.

20 Q By "station personnel," do you mean  
21 personnel at Davis-Besse?

22 A Basically, it was put -- I am not positive. This  
23 report could, you know, be many people submitting  
24 information to the various parts of it because there  
25 are so many different aspects and phases that no one

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1  
2 person would have total input. So it could have  
3 of the input could have been from part of their  
4 corporate engineering staff.

5 Q Would they all have been employees of  
6 Toledo Edison?

7 A Some of it, I think, was taken from information  
8 supplied by B&W.

9 Q When was the first time you saw this  
10 report, Exhibit 3?

11 A Soon after it was received in our office.

12 Q When did you receive it?

13 A I would have to review the report in our office  
14 to determine when it was actually received in the  
15 office.

16 Q Would it have been a few days after  
17 November 14, 1977?

18 A It usually takes about three days to a week  
19 for the mail to get to us.

20 Q So you believe you would have received it  
21 about the time you submitted or Mr. Fiorelli submitted  
22 Exhibit 2 to Toledo Edison on November 22, 1977? Is  
23 that a fair conclusion?

24 A That may be -- well, the report, your Exhibit 2  
25 report, was probably written before that.

1  
2 Q So the Exhibit 2 document did not, in any  
3 way, rely on the information contained in Exhibit 3?

4 A No, it did not.

5 Q When you received Exhibit 3, did you  
6 review it?

7 A I reviewed certain portions of it. I did not  
8 make a thorough review of it, no.

9 Q Did you find anything that was inconsistent  
10 with your report in Exhibit 2?

11 A I don't recall offhand any specific differences.  
12 There may have been a couple of time differences. This  
13 report was based upon going back and doing a detailed  
14 analysis of the time of events and there might have  
15 been several time variations.

16 Q Well, in terms of the substantive safety  
17 aspects of the September 24 transient, did you conclude  
18 that Exhibit 3 and your report, Exhibit 2, were in  
19 substantial compliance with one another?

20 A Except that this report included some items that  
21 were not included in my report, I believe, as I remember.  
22 It contained a lot more detail.

23 The inspection reports are written primarily  
24 to tell what the inspector looked at, what the  
25 corrective actions were. So they do not always contain

1  
2 all the detail of this report.

3 Q But certainly the most important safety  
4 aspects would have been included in your report?

5 A I think the one thing I didn't discuss in here  
6 to any great detail -- it was only mentioned in the  
7 report -- was the voiding in the primary system.  
8 I believe I only made mention of the voiding in the  
9 secondary reactor cooling pumps. I was aware of the  
10 information available <sup>from</sup> at B&W. I had seen B&W's  
11 documentation, their evaluation of the effects on the  
12 fuel. I don't think I got into it in the report though.

13 Q Let me back up for a second, Mr. Tambling.  
14 Is there any other method beside pressurizer level  
15 indication to determine the inventory in the reactor  
16 core itself at Davis-Besse?

17 A Any pressurized reactor, no.

18 Q So pressurizer level indication is the  
19 only method you have for determining what is going on  
20 inside the --

21 A No, I'm sorry, you do have temperatures and  
22 pressures in the system itself which help you indicate,  
23 but to direct level indication, no.

24 Q So it is only an indirect method of assess-  
25 ment of what is in the core?

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2 A Yes.

3 Q I believe you previously indicated that  
4 when you returned from your Westinghouse training  
5 seminar you spoke with Mr. Knop about the September 24  
6 transient. What followup did Mr. Knop involve himself  
7 in that you know of?

8 A Well, we submitted a proposed bulletin on the  
9 auxiliary feedwater pump governor problem, submitted  
10 that to headquarters of a possible bulletin to be  
11 submitted to all licensees. I would have to go back  
12 and look at some of my records to find out what else  
13 we did.

14 Q Well, did Mr. Knop involve himself with  
15 any questions of loss of pressurizer level indication  
16 high?

17 A To the best of my knowledge, no, none of us did.

18 Q Did he involve himself with aspects of  
19 manual override of the HPI system?

20 A Not -- again, to the best of my knowledge, not  
21 as a specific question.

22 Q So neither of these matters were considered  
23 by Mr. Knop to be exceptional situations, as far as  
24 you know?

25 A I don't believe that we identified those as



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specific problems.

Q On Page 9 of Exhibit 2, the first paragraph, the last sentence states:

"It should be noted that the electromatic relief valve control circuits are not classified safety-related and therefore do not fall within the normal quality control purview."

Do you believe that to be, today, a correct assessment?

A That is still correct today.

Q By PORV control circuits, do you mean the solenoid?

A Well, the control circuits take -- they have a pressure transmitter that transmits the pressure of the primary system, and when this reaches a setpoint, then you have a control scheme that opens the PORV. When the pressure decreases to a given setpoint, it closes it. It is designed <sup>with</sup> at a 50 psi dead band. In other words, you would bleed down well below the setpoint so you don't sit there and cycle.

As I said, the PORV in itself is not a safety-related valve. Therefore, the control circuit for it is not safety-related.

Q Except I believe you indicated that when

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the PORV fails in the open position, you do consider that to be a safety problem.

A I said of safety significance.

MS. MOE: "Safety-related" is a term of art. Maybe you can explain what that means.

MR. SIDELL: Fine.

THE WITNESS: "Safety-related" is primarily meaning of equipment required for the safe shutdown of the plant.

Q By "safe shutdown," what exactly do you mean?

A Being able to take the plant and shut it down and take it to a cold shutdown condition in the event of some operational transient.

Q No fuel damage?

A Depending upon the extent, there can be some fuel damage. If you have, you know, a major LOCA, large break, there is an estimated certain percentage fuel damage.

Q How about with small break LOCAs?

A Normally in small break LOCAs, you expect no fuel damage.

Q So generally you would classify safe cold shutdown as no fuel damage; is that correct?

A You have to qualify it to what the extent is.

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Q Let me put it this way: Has there ever been, to your knowledge, a large break LOCA in any reactor?

A No, not to my knowledge.

Q Have there been small break LOCAs, to your knowledge, in any reactor?

A Not as a result of a break in a pipe.

Q But there have been small break LOCAs?

A Well, there have been ones that you could classify as small breaks.

Q Was the situation on September 24, 1977 at Davis-Besse considered to be a small break LOCA?

A It was considered to be equivalent to a small break-type loss of coolant accident.

Q Was it considered to be that shortly after the transient occurred, during the investigational stages?

A Well, I can remember comparing the pressure-temperature relationships with the analysis that was done for a small break on this, and it fell within, generally within the same parameters. The temperature and pressure decreases were, you know, in general about the same.

Q Well, I take it you are familiar with the

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2 incident that happened at Three Mile Island Unit 2, on  
3 March 28 of this year, are you not?

4 A Yes.

5 Q You are also aware that at that plant at  
6 that time, the PORV failed in an open position and  
7 was not discovered by the operator for a period of  
8 some two hours and 20 minutes; is that correct?

9 A That is, as I remember, the approximate area.

10 Q And as a further result of that PORV valve  
11 failing open, inventory was lost in the core to the  
12 extent that the core became uncovered with substantial,  
13 at least as far as we know it at this point, fuel  
14 damage? Is that an essentially accurate summary of  
15 what we believe now has happened at TMI 2 in brief  
16 layman's terms?

17 A Well, I don't think you are really going to know  
18 what happened at TMI 2 until we get all the information  
19 in. There are still, as far as I know, some conflicting  
20 information and data.

21 Q Do you believe there was fuel damage?

22 A Yes.

23 Q Substantial fuel damage?

24 A There was damage enough that you released the  
25 fission gases, the accumulated fission gases from the

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*plus*  
fuel pens.

Q Which is something that would not be concluded to have been of no safety or health consequences to the public? In other words, if you were writing a report on TMI 2 after the March 28 1979 incident, you would not conclude with the term, "There is no public health or safety problem," would you?

A I guess I am not in a position really to answer that one.

Q I am not asking this to see if you would second-guess what has already been done, but just to find out whether or not, based on the definitions of a safe shutdown, what would happen at Davis-Besse.

A Well, the point is that, you know, the containment, even at TMI 2, prevented a gross release of radioactivity to the environment.

Q Which is not something that is programmed to happen?

A That is right, and the information I have is since the releases were within the *part* ~~Par~~-100 guidelines-- I am not the one that assesses and evaluates what *part* ~~Par~~-100 guidelines should be, so you would have to ask somebody better qualified to say that, you know -- I am going by those guidelines, so if they have not been

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exceeded, then --

Q Fuel damage is a problem that you don't want to run into?

A Absolutely.

Q Now, if you have a situation where the PORV fails open to the point where, for approximately two and a half hours, you are losing inventory in the core, uncovering the core, creating some amount of fuel damage as yet unknown, that would have been a safety-related problem, would it not, as the term "safety-related" is used in the industry?

A If you let your safety systems function properly, then it should not cause any significant fuel damage.

Q And by your statement, "let the safety systems function," does that mean not turning off the HPI system until you know exactly where your LOCA is?

A On hindsight, yes.

Q So as today's viewpoint, the statement that is included on Page 9 of Exhibit 2, "The electro-matic relief valve control circuits are not classified safety-related," is not as accurate as it could be?

A The reactor can still tolerate a loss of that valve and its function.

Q But there is a substantial safety problem



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2 if there is a small break LOCA by the PORV failing open  
3 complicated by a manual override of the HPI system pro-  
4 maturely, is there not? You caught it in time at  
5 Davis-Besse. They didn't catch it in time, presumably,  
6 at TMI 2.

7 Q But also there is information that would indicate  
8 that even up to that point, they weren't in trouble.  
9 It was subsequent events that occurred that really  
10 caused the fuel damage.

11 Q The primary one being the manual override  
12 of the HPI system which was based on the operator's  
13 viewing the pressurizer level indication off-scale high?  
14 A That is the reason I said I would like to see the  
15 final results of the whole thing. You know, you get  
16 bits and pieces of it.

17 Q So based on the information you currently  
18 have, you feel it is insufficient to determine whether  
19 or not that is the case?

20 A General philosophy is to do all you can to prevent  
21 an operational event.

22 Q So if you are faced with a choice between  
23 going solid --

24 A A plant ~~can't~~ <sup>can</sup> go solid. It is a desirable  
25 because you increase the possibility of a safety failure.

1  
2 which you really don't want.

3 Q Is the primary problem to be avoided by  
4 going solid a LOCA?

5 A Some small breaks you could, if you have high-  
6 pressure injection pumps -- I mean high head pumps.

7 Q I believe you previously indicated that  
8 you had not seen what has been labeled Exhibit 5 to  
9 the Creswell Deposition, entitled "Current Events  
10 Power Reactors."

11 A I said I may have seen it. I don't recall  
12 specifically.

13 Q You are aware, are you not, that on Page 2  
14 there is a section entitled, "Valve Malfunctions  
15 Primary System Depressurization," which relates  
16 specifically to the September 24, 1977 Davis-Besse  
17 transient?

18 A I noticed that, yes.

19 Q Did you notice also that there is no  
20 mention of the manual override of the HPI system  
21 in this recitation of what went on at Davis-Besse on  
22 September 24?

23 A No, I didn't read it that far.

24 Q If you were operating another B&W plant  
25 and received this Exhibit 5 of the Creswell Deposition,

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2 based on the information you read in here concerning  
3 Davis-Besse on September 24, would you have inquired  
4 further about what the potential problems were?

5 A That is all speculation. I couldn't answer that  
6 one. There are cases in which I have read other LERs on  
7 other plants and inquired <sup>to</sup> their application at my  
8 plant, and there are cases where I haven't.

9 Q But this would appear to be a relatively  
10 significant situation, September 24, would it not?

11 A In today's light, yes. In 1977 light --

12 Q Well, on Page 3 of Exhibit 5 to the Creswell  
13 Deposition, there is a reference to increase in  
14 pressurizer level indication and subsequently the  
15 operator shutting off the HPI system, is there not?  
16 I believe it is the second paragraph.

17 A The first full paragraph on Page 3, the second  
18 sentence says, "Meanwhile, the reactor operator observed  
19 the pressurizer level increase and manually tripped  
20 the reactor about one minute after MSIV closure two  
21 minutes into the transient." That is a correct state-  
22 ment but does not reference the high-pressure injection  
23 pumps. Those are the main steam isolation valves.

24 Q That is MSIV?

25 A Yes, and that is on the secondary system.

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Q Do you believe that when an operator of a nuclear plant would see that the pressurizer level indication was increasing, that might be of substantial interest?

A Up until the TMI incident, the operators were programmed, when they recovered pressurizer level, that they should secure their pumps to prevent the system from going solid. They were taught to rely upon that information.

My own feeling on that is, at that point in time, until TMI, that we did not fully appreciate what we call a leak at the top and out the top.

Q Which is a PORV failing open?

A Right, and the consequences of that.

Q When you say "we did not fully appreciate," besides yourself, who are you referring to? Mr. Knop?

A No, I am referring to everybody in the industry.

Q Without exception?

A I will have to say generally everybody, all right? There has to be exceptions.

Q Are you aware of a document called the Michelson Report, which I will state has been marked as Exhibit 8 to the Foster Deposition, which is entitled "Decay Heat Removal During A Very Small Break LOCA For

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2 A B&W 205 Fuel Assembly PWR," by C. Michelson,  
3 dated January 1978?

4 A I am aware that such a report existed.

5 Q Did you read such a report?

6 A I have not read that report.

7 Q When did you become aware that it existed?

8 A Sometime in the period late April 1979 to early  
9 May 1979.

10 Q After TMI 2 occurred?

11 A Yes.

12 Q Is it also fair to conclude that at the  
13 time of the September 24, 1977 Davis-Besse transient,  
14 you did not fully appreciate the consequences of  
15 pressurizer level indication going off-scale high and  
16 the consequent operator reaction to that situation,  
17 specifically turning off the HPI system?

18 A I missed the first couple of words of your  
19 question.

20 MR. SIDELL: Read it back.

21 (Record read.)

22 A What I was not aware of is what was causing --  
23 I did not have an appreciation as to what was causing  
24 the pressurizer level to increase. The fact that the  
25 pressurizer level was going up and going off-scale and

1  
2 the operator turning off the high-pressure injection  
3 pumps, I think, is immaterial. I think it is what was  
4 causing the pressurizer level indication to increase at  
5 such a rate is what I did not have an appreciation of.

6 Q Are you aware whether reactor operators  
7 rely primarily on pressurizer level indication in  
8 their operation of the plant?

9 A That is the general way that they are taught,  
10 but they are also supposed to be taught to assess the  
11 other parameters. But that is the first one that you  
12 normally look at.

13 Q So if an operator reviewing a pressurizer  
14 level indication increase at the rapid rate which you  
15 previously had not seen at Davis-Besse, which occurred  
16 there on September 24, 1977, looked at that increase  
17 and the rate of increase, his first reaction would be  
18 to what?

19 A Well, number one is that he would have a problem  
20 assessing the rate of increase, all right, because the  
21 instrumentation does not give him a rate of increase.  
22 Basically, he sees the instrument going up.

23 Q And he wants to avoid going solid?

24 A That is correct.

25 Q Which is what is indicated by pressurizer



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2 level indication going off-scale high, is it not?

3 A Yes, so it is very difficult for him to assess  
4 the rate of increase.

5 Q But seeing pressurizer level indication  
6 going high, going off-scale high, is the first thing  
7 that an operator would do, if not by training, by  
8 instinct, to cut off the HPI system?

9 A That is the way he was trained.

10 Q Because the pressurizer level indication  
11 is the primary method of determining what is going on  
12 with inventory in the reactor core?

13 A That is a primary indication of what was going  
14 on in the reactor core. I think the fact that the  
15 operators in the control room in the September 24 event  
16 caught the problem when they did was the fact that  
17 they were also looking at other parameters, too.

18 Q And perhaps we should also state for the  
19 record at what level of power Davis-Besse was operating  
20 on September 24, 1977.

21 A The quoted power is 9 percent.

22 Q Do you happen to know the level of operation  
23 at TMI 2 on March 28, 1979?

24 A Above 90 percent. I don't remember whether it  
25 was 94, 95, 96, 97 or 98.

1  
2 Q I will represent to you that it is in the  
3 range of 97 to 98 percent capacity.

4 A All right.

5 Q Would that have made a difference in the  
6 reaction of the operator to finding the PORV failed  
7 open at Davis-Besse on September 24, 1977?

8 A I really can't answer that one right now. I  
9 would have to sit down and look at the data. My  
10 feelings are that whether it had been 9 percent or 98  
11 percent power, what alerted the operators at Davis-  
12 Besse was the fact that they realized that their  
13 temperature had gotten down to saturation point, and  
14 that is what drew their attention to the valve that  
15 opened up.

16 Q But by virtue of the fact that they were  
17 operating at a relatively low level of production, there  
18 would not appear to be the immediacy of correcting the  
19 problem as there may have been if they were operating at  
20 the other end of the scale of production; is that a  
21 fair conclusion?

22 A I would not want to draw that conclusion until  
23 you have analyzed it. To the best of my knowledge, nobody  
24 has sat down and tried to analyze that.

25 Q Well, let me see if we can draw an analogy.

1  
2 If you are driving a car at five miles an hour and you  
3 have a failure of the brakes, would you react the same  
4 or would you preceive the operator of the car would  
5 react the same as if he noticed a failure of the brakes  
6 at 70 miles an hour?

7 A It depends whether I was going downhill or uphill.

8 Q Level road, and it was required that you  
9 stop, therefore you needed the brakes.

10 A I really don't see the significance of your point  
11 that you are trying to make, so I don't know how I can  
12 answer it.

13 Q Let me show you the Michelson Report,  
14 Exhibit 8 to the Foster Deposition, Section 4.6,  
15 "Pressurizer Level Indication," specifically directing  
16 your attention to the second from the last sentence on  
17 the page:

18 "Therefore, pressurizer level indication is not  
19 considered a reliable guide as to core cooling con-  
20 ditions. No other primary side level indication is  
21 provided."

22 Would that information, if available to the  
23 operator at Davis-Besse on September 24, have been  
24 helpful in assessing the transient?

25 A The only way I can answer that one is to say

1  
2 that the initial reliance on the pressurizer level  
3 probably led to them securing their high-pressure  
4 injection pumps before they should have, but that ~~that~~  
5 was not the only thing they relied upon. The results  
6 indicate that they also relied upon their system's  
7 temperatures and pressures to determine that they had a  
8 valve open and reacted to that.

9 Q Are you familiar with a document referred  
10 to as the Novak Memorandum?

11 A No.

12 Q Do you know a Thomas M. Novak?

13 A I have talked with Thomas, a Thomas Novak at NRR  
14 on the telephone.

15 Q Well, I represent to you that as of January  
16 1978, he was the chief of the Reactor Systems Branch at  
17 NRR. The Novak Memorandum, which has been marked as  
18 Exhibit 5 to the Foster Deposition, dated January 10,  
19 1978, is from T. M. Novak to RSB members, which I  
20 believe to be Reactor Systems Branch members of his  
21 section, concerning loop seals in pressurizer surge  
22 line.

23 Have you ever seen this document before?

24 A No, I have not.

25 Q Why don't you take a minute to review it.

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2 A How did Foster get hold of this?

3 Q I don't believe that Foster did. It merely  
4 was referenced to his deposition.

5 A Oh, because I thought I had reviewed all of his  
6 information.

7 I have read it. I am not sure I fully understand  
8 what the significance of it is without studying it  
9 further.

10 Q Specifically referring your attention to  
11 Paragraph 3, "Although the safety analyses do not  
12 require termination of the makeup system, operators would  
13 control makeup flow based on the pressurizer level as  
14 part of their normal procedures."

15 Do you agree with that statement, Mr. Tambling?

16 A Well, I really don't know what, you know, the  
17 context of this was, what he is trying to get at with  
18 this point.

19 Q Well, it appears that safety analysis,  
20 either preliminary or final, required of operators, do  
21 no require an operator to terminate the makeup system  
22 for a loss of coolant in the core, and that the primary  
23 method that operators have of determining what is going  
24 on in the core is the pressurizer level indication, which  
25 is what they refer to in the course of their normal  
operating procedures.

1  
2 A Well, I agree with the statement that the  
3 pressurizer level is a primary indication of inventory  
4 in the reactor coolant system. I do not know what  
5 the significance of the statement "Safety analysis do  
6 not require termination of the makeup system" is. I  
7 really don't understand what that statement means  
8 because -- I don't know what makeup system he is really  
9 talking about, whether it is -- I assume if you assume  
10 it is the normal makeup systems -- I don't know.  
11 Generally as soon as you get down -- Davis-Besse --  
12 you get down to the safety feature actuation system  
13 actuation point, currently that makeup system is  
14 isolated, so it is terminated until you reestablish it.

15 Q On September 24, 1977 were you aware that  
16 the Davis-Besse facility had some peculiarities distinct  
17 from other B&W reactors, specifically the PORV and the  
18 SFAS situation you just referred to?

19 A I was aware that there are various differences.  
20 Prior to that I was not aware of the different make of  
21 the pressurizer relief valve, that Davis-Besse had a  
22 raised loop plant versus a low loop plant as other B&W  
23 plants are. There are differences in the safety  
24 features actuation systems equipment that is actuated,  
25 that other plants had high pressure pumps versus the



1  
2 1600-pound high pressure pumps, the fact that their  
3 auxiliary feedwater system was safety graded. I could  
4 keep on going.

5 Q With reference to the Novak memorandum,  
6 Exhibit 5 of the Foster deposition, the second sentence  
7 in Paragraph 3 refers to the fact that the operator could  
8 erroneously shut off makeup flow when significant void  
9 occurs elsewhere in the system or loss of inventory is  
10 continuing.

11 Is this not the precise situation that  
12 happened at Davis-Besse on September 24, 1977?

13 A Well, I question the word "significant." I  
14 still don't feel there were significant voids and there  
15 was no significant loss of inventory as a result of that.

16 Q Well, would you consider it to be a signifi-  
17 cant loss of inventory in terms of the amount of the  
18 inventory left at the time the PORV was failed open?

19 A I don't appreciate what the significance of the  
20 question is.

21 Q Well, you stated that you don't agree with  
22 Mr. Novak's use of the word "significant" with reference  
23 to a void occurring in the primary system. My question  
24 is whether you are referring, in your construction of  
25 "significant," to a loss of inventory in the core or the

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2 length of time the PORV is failed open allowing the  
3 level in the primary system to decrease. It is merely  
4 two different points around the circle, the fail open  
5 PORV causes, in this instance, a reduction in the  
6 inventory in the core, does it not?

7 A It causes a reduction of inventory in the  
8 pressurizer. Well, I shouldn't say that either, that  
9 is not correct. If you have voids forming in the  
10 core, actually <sup>pressurizer</sup> inventory ~~pressure~~ can increase.

11 All I can say is, you know, in the case of the  
12 event at Davis-Besse there was a loss of inventory in  
13 the core or in the primary system and there might have  
14 been some voiding in the core to be able to push the  
15 level of the pressurizer up. In neither case do I call  
16 them significant from the amount when you consider the  
17 total volume of the pressurizer and the total volume of  
18 the primary system itself.

19 Q Let me put it this way: Would you consider  
20 what has been reported to have been lost from the  
21 primary system at TMI 2 on March 28, 1978 to be  
22 significant?

23 A Yes.

24 Q So the third paragraph of the Novak memorandum,  
25 Exhibit 5 to the Foster deposition, appears to, as we now

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know it, precisely describe what happened at TMI 2,  
which is similar to what happened at Davis-Besse but  
for the operator's capability at terminating the  
transient at Davis-Besse sooner than otherwise might  
have been the case?

A It would appear that it describes the condition  
that occurred at TMI.

MR. SIDELL: Why don't we recess for lunch.

It is 2:00 o'clock now. Be back about 3:00 o'clock.

(A luncheon recess was held at 2:00 p.m.)

o0o

## AFTERNOON SESSION

3:10 p.m.

4 T H O M A S T A M B L I N G, having been  
5 previously duly sworn, was examined and testified  
6 further as follows:

7 DIRECT EXAMINATION (Continued)

8 BY MR. SIDELL:

9 Q Mr. Tambling, I believe you previously  
10 testified that there were some subsequent events at  
11 TMI 2 that caused various problems that resulted there  
12 besides the manual override of the HPI system. Do you  
13 recall that part of your testimony?

14 A Yes.

15 Q What other or what were the subsequent  
16 events that you referred to?

17 A One was turning off the primary coolant pumps and  
18 the other was attempting to depressurize the primary  
19 system prior to cooldown of the primary water system  
20 below saturation temperature.

21 Q In the sequence of events as we now under-  
22 stand it at TMI 2, when did those two events occur  
23 relative to manual override of the HPI system, before  
24 or after?

25 A As I remember, the pumps -- as I recall, the HPI's

1  
2 were turned off first and then the pumps, primary  
3 coolant pumps, the last two were turned off next, and  
4 then quite a ways down the line they tried to depres-  
5 surize the primary system and get it on the decay cooling  
6 system. The primary damage was done in that last event.

7 Q That was the action attempting to eliminate  
8 the hydrogen bubble in the containment?

9 A No, that was the action taken to try to get the  
10 system down on decay heat to cool down the primary  
11 system, but you have to depressurize down to below  
12 400 pounds before you can do it because that is only a  
13 400-pound system. That was the one that resulted in  
14 the major uncovering of the core.

15 Q Would you say that the basic problem at  
16 TMI 2, from what we know the facts were, was caused by  
17 erroneous readings in the pressurizer level indication?

18 A The basic problem at TMI was that the auxiliary  
19 feedwater system was valved out.

20 Q The 12 valves?

21 A Well, there were two valves involved and had those  
22 not been valved out we would have never gotten into the  
23 situation which they had. If the aux feedwater system  
24 had provided for the heat sink, it would have been just  
25 another transient, loss of feedwater transient. The

1  
2 fact that they were valved out and the system over-  
3 pressurized, you lost your pressure relief valve and  
4 subsequent actuation of the high pressure injection  
5 pumps, if those had been allowed to continue to operate  
6 and make up the loss of inventory, it still would have  
7 probably another transient.

8 Q So by virtue of the operator turning off  
9 the HPI system as a result of doing the pressurizer  
10 level indication going off scale high, at the very  
11 least exacerbated the problems that resulted?

12 A That is correct.

13 Q So, generally speaking, the pressurizer level  
14 indication is of substantial importance in the way a  
15 nuclear facility is currently operated; is that a fair  
16 conclusion?

17 A Yes, it is a very important indication under normal  
18 circumstances of primary water system inventory, but it  
19 is not the only item that you have to rely upon.

20 Q Referring both to temperature and pressure  
21 in the reactor core itself?

22 A That or in the loops.

23 Q You previously testified that there were  
24 several changes in operational procedure, the first  
25 being implemented in December of 1978. When were



1  
2 subsequent procedural changes made and what were they?

3 A In 1978 they established the criteria for turning  
4 off the HPI pumps, essentially said to leave them on  
5 until either you are down on decay heat cooling and  
6 established <sup>2800</sup>~~800~~ gpm flow or you have switched off into  
7 the recirc modes and have gone on some type of piggyback  
8 operation which you can throttle valves.

9 The subsequent revisions were made as a result  
10 of Bulletins 79-05A, B, and the shutdown order.

11 Q So those were after the accident at TMI 2?

12 A Yes.

13 Q Are you familiar with IE Bulletin 79-06B?

14 A That was the one submitted to the other pressurized  
15 water reactors.

16 Q Davis-Besse did not receive a copy of this  
17 bulletin?

18 A What is the subject?

19 Q It is entitled "Review of Operational  
20 Errors in System Misalignment during the Three Mile  
21 Island accident" dated April 14, 1979.

22 A I believe that one was directed to Westinghouse  
23 and CE plants with an information copy to Davis-Besse  
24 since the B&W plants were specifically covered under  
25 79-05A and B.

1  
2 Q Do you recall any other revisions in the  
3 procedures prior to TMI 2?

4 A There were other procedures, but I don't think  
5 they were related specifically to the operation of  
6 the HPI pump, leaving it on.

7 Plant procedures are always under constant review  
8 and revision. The licensee, basically, you know, sets  
9 up a schedule to periodically review all plant procedures.

10 Q Did Mr. Knop take any further actions that  
11 you know of concerning manual override of the high  
12 pressure injection system?

13 A At that particular time, within the scope of that  
14 inspection report, no. It was subsequent to that.

15 Q Are we talking about Exhibit 2, your  
16 inspection report?

17 A Yes.

18 Q How about after that, in 1978, did  
19 Mr. Knop --

20 A Yes. He directed me to review and implement  
21 the temporary instruction that we received. I don't  
22 remember the number of it.

23 Q Do you remember the date, approximate time,  
24 when Mr. Knop instructed you to develop this temporary  
25 procedure?

1  
2 Q As part of 79-05A, dated April 5, 1979,  
3 there is a requirement, is there not, that the HPI system  
4 essentially is to be left on until the problem, whatever  
5 it may be, is isolated and corrected?

6 A Plus -- or that you have established a thousand  
7 gpm flow in the decay heat system and you have sub-  
8 cooling of at least 50 degrees.

9 Q Which is a substantial modification or  
10 change of procedures than previously existed?

11 A In some respects what Davis-Besse had put in  
12 their revision prior to that was somewhat a little more  
13 conservative. They said they should leave it on until  
14 they establish <sup>2800</sup>~~800~~ gpm flow in the decay system.

15 Q Was this the only other operational procedure  
16 change that occurred at Davis-Besse?

17 A No, there are probably a total of something like  
18 140 procedures that were revised directly or indirectly  
19 as a result of the review.

20 Q But concerning the HPI system, was this the  
21 second and only other change in the procedures?

22 A Well -- that particular emergency procedure has  
23 been -- the December revisions, as I remember, were  
24 something like Rev 3 and 4, and I believe we are up to  
25 Rev 11 or 12 in that procedure right now.

1  
2 critical August 12, 1977. The first criticality, *The*  
3 meeting took place in October and I identified some  
4 potential areas that needed management attention.

5 Q Did you mention manual override of the HPI  
6 system in this meeting?

7 A In the October meeting?

8 Q Yes.

9 A No, sir.

10 Q Excuse me?

11 A No.

12 Q How about loss of pressurizer level indication  
13 off the high side?

14 A I do not remember that being an item either.

15 Q Section (b) refers to a failure to properly  
16 follow procedures requiring additional corrective  
17 actions. What specific procedures did the operator  
18 fail to follow as referred to in that section?

19 A I do not remember specific details of which  
20 procedures. In general, these were, as I remember,  
21 these were procedures associated with their administra-  
22 tive control <sup>were</sup> with the primary problems -- these were  
23 not specific procedures that the operators were not  
24 following per se, they dealt with -- again, without  
25 completely refreshing my memory by going back and

1  
2 A No. I did not develop -- the procedure was  
3 supplied from I&E headquarters. It came out of that.  
4 It is an inspection procedure and that time frame that  
5 I remember that I made the inspection was in October of  
6 1978.

7 Q Let me show you a document concerning  
8 Toledo Edison dated 9/21/78 where you and R. C. Knop  
9 are listed as the inspectors concerning an inspection  
10 on August 16, 1978, and ask you if that is what you  
11 are referring to.

12 A No. This is a report on a management meeting  
13 that we had on August 16, 1978 reporting the results  
14 of the meeting with management to discuss certain  
15 problems that I had identified at the plant.

16 MR. SIDELL: Let's have this marked as  
17 Exhibit 4.

18 (The above-described document was marked  
19 Tambling Deposition Exhibit 4 for identification,  
20 this date.)

21 Q On Page 2 of Exhibit 4, under the heading  
22 "2. 'MANAGEMENT MEETING,' subsection (a), Problem areas  
23 identified in the management meeting held October 24,  
24 1977 and the fact that many of these items still persist,"  
25 what specifically were the problem areas referred to in

1  
2 that section of this report?

3 A I am afraid if I answer that without having that  
4 report that I may confuse some of the items that came  
5 up in subsequent reports.

6 The October 24, 1979 was a routinely scheduled  
7 management report that is required by our inspection  
8 program. It is called the "Third Management Meeting."  
9 It is usually conducted after the licensee has gotten  
10 his operating license and it is a meeting between my  
11 management, Region management, and the licensee's  
12 corporate management to discuss the overall inspection  
13 program from the operating standpoint, and many times  
14 it is also used to -- you have a changeover in NRR  
15 from the project manager -- in Construction, construction  
16 project manager to the operations project manager.  
17 In other words, you switch within NRR, you switch from  
18 Construction to Operating and they have the overview.  
19 And that particular October meeting, the then designated  
20 project operations manager and his branch chief attend  
21 the meeting too.

22 As I remember the meeting, I identified what I  
23 considered as potential problem areas that appeared to  
24 be developing in the early phases of operation. At that  
25 time they had only been operating since -- they had gone



1  
2 looking, these would be things like work orders, tagging,  
3 wire log, possibly facilities change. Those are  
4 examples.

5 Q How about eliminating nuisance alarms?

6 A What would you like to know about that?

7 Q Was that discussed, was that a concern  
8 of the operator?

9 A It is very possible that it was discussed then.  
10 I can't verify it without going back to my notes.  
11 That has been a continuing concern of mine.

12 Q In Exhibit 2, your November 22, 1977 report,  
13 on Page 14 there seems to be an emphasis on eliminating  
14 nuisance alarms and <sup>lighted annunciators</sup> ~~light enunciators~~ which, I take it,  
15 are warning lights of some sort?

16 A Yes.

17 Q Is there a substantial problem with that  
18 situation at Davis-Besse?

19 A There is a problem with nuisance alarms at  
20 Davis-Besse.

21 Q Currently?

22 A Still.

23 They established a task force to look at each  
24 one of these problem areas and tried to rectify the  
25 problems. This task force has not been meeting or

1  
2 effective since the TMI event.

3           There has been some progress made in trying to  
4 reduce the number of nuisance alarms.

5           Q       Well, it appears, in general, from  
6 Exhibit 2, your November 22, 1977 report, that there  
7 is greater concern relatively speaking, than with  
8 eliminating nuisance alarms of one sort or another  
9 than there was with manual override of the high  
10 pressure injection system. Is that accurate?

11          A       That is correct. We did not establish -- I think  
12 I told you before I had not established the manual  
13 override as a major problem area.

14          Q       Similarly, with loss of pressurizer level  
15 off the high side?

16          A       That is correct.

17                 That particular thing, we were primarily  
18 addressing the equipment problems or the failures that  
19 occurred, the correction of those which would prevent  
20 these other items from occurring.

21          Q       On December 20, 1978, did you participate  
22 in a telephone conference between Toledo Edison and  
23 the NRR?

24          A       I believe I did. I would have to look at my  
25 telephone log.

1  
2 Q Would it refresh your recollection if I  
3 told you that Sy Weiss, Brian Grimes, Guy Vissing,  
4 C. E. Novak, James Streeter, Mr. Knop, Mr. Fiorelli,  
5 and Mr. Creswell, also participated in that telephone  
6 conference? I believe there were possibly three on  
7 either that date or shortly around that time.

8 A In all probability I participated.

9 Q You have no independent recollection today  
10 about that conversation?

11 A No -- well, you say there were several conversa-  
12 tions during that period of time and I know I participated  
13 in some of them. Whether I participated directly in  
14 that one --

15 Q Do you recall during any of those conversa-  
16 tions, which you may have participated in, the subject  
17 of manual override of the high pressure injection system  
18 coming up?

19 A No, because that wasn't the subject under discus-  
20 sion. This was completely divorced from that.

21 Q The same thing with a loss of pressurizer  
22 level indication on the high side, or did that subject  
23 come up?

24 A This subject was loss of pressurizer level on the  
25 low side under discussion at that time. It was not

1  
2 associated with the overpressurization, voiding the  
3 core. It was primarily dealing with loss of pressurizer  
4 level on the low side and voiding of the pressurizer,  
5 itself.

6 The particular subject there at that time was  
7 based upon the excessive cooldown of the primary system  
8 causing loss of pressurizer level indication. It was  
9 a completely different subject than the September 24th  
10 event.

11 Q Well, was the purpose of this meeting  
12 concerned primarily with the November 29, 1977  
13 transient at Davis-Besse where there was loss of  
14 pressurizer level indication on the low side?

15 A That was, I believe, what precipitated a lot of  
16 it. The major thing that precipitated the whole thing,  
17 without going back to my notes, was the fact that the  
18 licensee wanted to establish this dual setpoint control  
19 and that was at about the time frame that this problem  
20 of requiring a steam generator level, auxiliary feed-  
21 water steam generator level 120 inches for the small  
22 break analysis. It was in that time frame that B&W  
23 said, "You can't go to the 35-inch steam generator level  
24 with aux feed if you have a small break because our  
25 small break analysis assumes 120 inches in the steam

1  
2 generator and if you want to go to the 35-inch level,  
3 then you have to completely redo the analysis."

4 So the question was do we establish a dual set-  
5 point on control of the steam generator level. And  
6 the problem there was had it been analyzed and what  
7 were the effects.

8 Q Did you see a copy of the B&W analysis  
9 with the dual setpoint proposal?

10 A I saw a copy of what -- the analysis that TECO  
11 submitted to the NRC.

12 Q Was that obtained from B&W?

13 A Let's clarify. Do you mean B&W analysis to  
14 support the dual setpoint?

15 Q Yes.

16 A I did not see specifically what B&W had supplied  
17 TECO.

18 Q Did you hear about that study?

19 A The responsibility of that review was NRR's and  
20 I accepted their review of it.

21 Q Do you know if NRR made an independent  
22 evaluation or analysis of the B&W study?

23 A I cannot answer that.

24 Q You don't know whether or not they did?

25 A No, I do not.

1  
2 Q At the time of this December 20, 1978  
3 telephone conference, do you know if Seymour Weiss  
4 was aware of the problem of loss of pressurizer level  
5 indication high?

6 A I do not know whether he was aware of it or not  
7 because that was not the subject and the discussion in  
8 those conversations.

9 Q Do you know if Brian Grimes was aware of  
10 that problem?

11 A No, I do not know.

12 Q Do you know if anyone involved in that  
13 telephone conversation knew about the loss of pressurizer  
14 level indication high?

15 A I do not know.

16 Q Do you know why loss of pressurizer level  
17 indication high was not discussed at that meeting?

18 A Basically because that was not the subject under  
19 discussion. The subject was the loss of pressurizer  
20 level -- inventory during a rapid cooldown of the system  
21 and whether or not it involves an unreviewed safety  
22 question.

23 Q Well, between the two situations, loss of  
24 pressurizer level indication high and low, which of the  
25 two could produce the more serious results?



1  
2 A I don't know if -- the fact that the pressurizer  
3 level goes high can be due to many, you know, facets or  
4 problems. The fact that you lose -- I mean it goes  
5 above the high level indication, in itself, is not a  
6 major problem.

7 Q I recognize that the mere fact that the  
8 level indication goes above or below the indication  
9 is not the problem, but the results of what that indi-  
10 cates -- in other words, it is going off the high end,  
11 it appears to you the operator as though the system  
12 is going solid, correct?

13 A Correct.

14 Q If it goes off the low end, it appears to  
15 the operator as though he is losing inventory in the  
16 core, correct?

17 A Correct.

18 Q Now, based on the frequency with which  
19 Davis-Besse's plant operators had experienced one versus  
20 the other type of pressurizer level indication loss and  
21 the expected operator responses to those losses, my  
22 question is which alternative would produce the more  
23 serious or significant problem?

24 A Losing pressurizer level low occurs much more  
25 frequently, with a greater frequency than having it go

1  
2 off the high end. Actually, losing pressurizer level  
3 low, if you let it go too far low, it could result,  
4 again, in it coming back up and going off on -- it  
5 could conceivably form voids in your primary system and  
6 reflood the pressurizer.

7 I don't think I am in a position right now to, you  
8 know, state which is more significant. All I can say  
9 is going down the low end occurs more often than you  
10 have going high. Normally the only time you would get  
11 a real high indication that was false is when you have  
12 really an opening in the top because if you don't have  
13 an opening in the top, then you can't have the loss of  
14 inventory in the pressurizer, and so as the water flows  
15 back in there you are going to have to equalize pressure  
16 with the primary system.

17 Q Would it be plausible that the reason loss  
18 of pressurizer level indication high at this December 22,  
19 1978 telephone conference was, at least in part, due  
20 to the relative infrequency with which it occurred  
21 compared to pressurizer level indication low; something  
22 nobody experienced to any appreciable extent and there-  
23 fore you didn't have to consider it?

24 A I think the reason why it was not discussed in that  
25 December 20, 1978 call was it was not under consideration

1  
2 at the time and what you say may be well the reason,  
3 but my estimation is that it didn't come up because we  
4 were discussing a specific problem that was not related  
5 to it.

6 Q Were there any plans at that time that you  
7 know of to have another telephone conference where  
8 loss of pressurizer level indication high would be  
9 considered?

10 A Not to my knowledge.

11 Q Now, at or before this time, before  
12 December 20, 1978, was anyone in Region III concerned,  
13 to your knowledge, about loss of pressurizer level  
14 indication high?

15 A No.

16 Q What about turning off the high pressure  
17 injection pumps prematurely, was anyone in Region III  
18 concerned about that?

19 A Yes.

20 Q Who was that?

21 A I believe that was brought up by either Mr. Streeter  
22 or Mr. Creswell.

23 Q What were their concerns, as you remember  
24 them, concerning premature termination of the HPI system?

25 A I know one of them was that they felt it was not a

1  
2 good practice until you could establish where your leak  
3 was located and whether or not you had a leak in the  
4 pressurizer ~~level~~ valve, but I don't believe it was  
5 associated with the pressurizer level going high.

6 Q How did you come to know about either  
7 Mr. Creswell or Mr. Streeter's concern about premature  
8 termination of the HPI system, was it in oral conversa-  
9 tions?

10 A That and I have to read their reports prior to  
11 them being issued.

12 Q Were you routinely copied on either Creswell  
13 or Streeter's reports?

14 A Yes. I have copies of all those in my files.

15 Q Let me show you what has been marked as  
16 Exhibit 3 to the Creswell deposition and ask you whether  
17 or not you have previously seen that document which is  
18 addressed to Toledo Edison dated October 25, 1978 from  
19 Gaston Fiorelli, Chief Reactor Operations and Nuclear  
20 Support Branch?

21 A Yes, I have seen it and read it before.

22 Q Do you remember whether or not this report  
23 was circulated to you prior to being distributed?

24 A All reports are circulated to me prior to sending  
25 them to the licensee.

1  
2 Q On Page 2 of this Exhibit 3 to the  
3 Creswell deposition, your name appears on the bottom.

4 A That is correct.

5 Q But there is no date below your name  
6 presumably for you to sign off on seeing this prior  
7 to distribution. Did you merely review it without,  
8 perhaps, unintentionally including the date of review  
9 on the exhibit?

10 A Well, those are my initials down there, and to the  
11 best of my knowledge I have never post-initialed a report.  
12 Usually if somebody else signs off for me, they initial  
13 it.

14 Q So that is a mere oversight, by failing  
15 to put down the date, on your part?

16 A Yes. I do generally see these things before  
17 they are distributed.

18 Q Do you happen to know where Central Files  
19 designation listed on Page 2 of the distribution of  
20 this exhibit is located?

21 A I am not sure -- I believe that is our central  
22 files.

23 Q When you say "our," do you mean Region III?

24 A Yes.

25 Q Do you know what PDR stands for on that

1 distribution list?

2 A Public document reading room.

3 Q Where is that located, if you know?

4 A I believe the one for Davis-Besse is located in

5 ~~Fort~~ <sup>Port</sup> Clinton, Ohio -- I am sorry, the local PDR is

6 the ~~Fort~~ <sup>Port</sup> Clinton one. The PDR room -- there is one

7 in our region and I also believe there is one here.

8 MS. MOE: 1717, yes.

9 Q Am I correct in stating that the PDR listed

10 in the distribution on Page 2 of this exhibit is the

11 public document room at 1717 --

12 MS. MOE: H Street Northwest.

13 Q At NRC headquarters in Washington, if you

14 know?

15 A I don't know. These are clerical things that

16 are handled by our clerical people, and I very seldom

17 get involved in that.

18 MS. MOE: But generally each of these

19 documents would end up in the central public

20 document room.

21 MR. SIDELL: All right.

22 Q If you would, turn to Page 3 of this exhibit,

23 please, Mr. Tambling, the second paragraph. The second

24 and third sentences refer to the premature termination



1  
2 of the HPI system -- "premature" meaning the operator  
3 turned them off before determining where the LOCA was --  
4 is that essentially your reading of that paragraph?

5 A As I remember the concern, it was that they blocked  
6 them, the SFAS initiation, very early into the event,  
7 but they also have to block these things to re-establish  
8 makeup flow because makeup flow is isolated on the SFAS  
9 initiation. That was one of the concerns was, you know,  
10 the early blocking, the fact that this is one of the  
11 first things that the operator did was to block it.

12 Q When you say "block it," does that mean  
13 turn it off?

14 A No. All you do is -- blocking it allows the  
15 operator then to take manual control. Blocking it in  
16 no way changes the state of the equipment, whether it  
17 is operating or whether the valve is open or closed.  
18 All -- what it does is means that the operator now can  
19 take manual control when he blocks it.

20 Q Well, the second sentence indicates that  
21 the SFAS system was blocked prior to "turning off the  
22 high pressure injection pumps and the discovery of the  
23 cause of the loss of the reactor coolant" which, in other  
24 words, is manual override of the HPI system, is it not?

25 A When the operator takes manual control, he is

1  
2 overriding the normal safety position of the equipment,  
3 but he is also responsible when he does this if condi-  
4 tions change to return or, in this case, restart the  
5 pumps.

6 Q But nevertheless, this report indicates an  
7 unresolved problem concerning manual override of the  
8 HPI system before the LOCA is isolated?

9 A Yes, and that was corrected.

10 Q And the last sentence in the second para-  
11 graph indicates "This matter is unresolved."

12 Now, on October 25, 1978, when this was  
13 distributed, that was an accurate statement, to the  
14 best of your knowledge?

15 A Yes, it was.

16 Q And there was no mention in the December  
17 meeting of 1978 about this problem?

18 A No, there was not.

19 Q Do you recall any conversations or further  
20 reports that you saw indicating when this matter was  
21 to be resolved?

22 A I don't remember specifically whether it was  
23 addressed in other reports or not. I do not know that  
24 the matter has been resolved.

25 Q When was that?

1  
2 A I have to explain. The previous revisions that  
3 were made in October-December 1978 to the emergency  
4 procedure. I had looked at those and I was satisfied,  
5 but this was an open item raised by the Creswell-Streeter --  
6 I think the Creswell report.

7 Q This report was made specifically with  
8 reference to the September 24, 1977 transient at  
9 Davis-Besse, was it not?

10 A Yes.

11 Our normal policy in the region is the person  
12 who has the unresolved item is responsible for seeing  
13 that it is closed out. The purpose of this is to,  
14 you know, prevent somebody else from writing off on  
15 something we didn't fully understand what his major  
16 concerns were, so it would have been the responsibility  
17 of Mr. Creswell to close this out in his report.

18 Q Do you know if he did that?

19 A To my knowledge, I don't think he has closed it  
20 out.

21 Q Do you know what else he may have done after  
22 October 25, 1978 in this respect?

23 A My recall says that he looked at the first  
24 revision that they made on this thing and was not satis-  
25 fied and asked them to change it, to address another

1  
2 concern that he had. I believe the licensee addressed  
3 that in his second revision. I think I told you before,  
4 as I remember, the first change was made, Rev 4, subse-  
5 quent one was -- Rev 3, then 4, but I would have to  
6 look at my records and procedures to verify that.

7 Q Do you know if Toledo Edison or any of the  
8 officers at Davis-Besse made any analysis of voiding  
9 the pressurizer by overfeeding the steam generators with  
10 auxiliary feedwater?

11 A That was the analysis that they submitted to us --  
12 to the NRC, when I say "us" -- in December of 1978.

13 Q And the NRC evaluated that analysis?

14 A I believe that is what I said, that NRR received  
15 that, looked at it. We also reviewed it -- and I am  
16 trying to remember, but I believe that December 20,  
17 1978 phone call, a part of that was trying to resolve  
18 some of our questions..

19 Q Let me show you a copy of Exhibit 2 to the  
20 Creswell deposition dated December 22, 1978 to the NRR,  
21 Robert Reid from Lowell E. Rowe of Toledo Edison which  
22 is a cover letter and a report entitled "Additional  
23 Safety Evaluation of the Transient Resulting from  
24 Inability of Operator to Control Steam Generator Level  
25 at 35 Inches."

2 Have you ever seen this report?

3 A Yes.

4 Q When did you see that?

5 A It would probably have been late January.

6 Q 1979?

7 A Yes. That would have been the earliest.

8 Again, I can't say until I find out when the thing  
9 was received in our office.

10 <sup>Things</sup>  
~~Self~~-addressed to NRR would take any place from  
11 a week to four weeks to make our office.

12 Q So at the earliest you could have seen this  
13 on December 29, 1978; is that correct?

14 A I am sorry, I was thinking of something else.

15 Q If it takes at least a week and sometimes  
16 four weeks for you to receive materials submitted to  
17 NRR, the earliest you could possibly have seen this  
18 report, Exhibit 2 to the Creswell deposition, would  
19 have been December 29, 1979, one week after the date  
20 it is distributed.

21 A Yes, except I was not in the office that week.

22 Q So it would have been sometime after?

23 A Wait a minute, I take that back. I went on leave  
24 about that time and I can't remember exactly when it was.  
25 That is why I said I didn't think I could have read it

1  
2 until late January.

3 Q Did you concur in their analysis?

4 A Normally it is the responsibility of NRR to review  
5 the analysis. Our responsibilities are to inspection  
6 and enforcement.

7 Q So you, yourself, did not independently  
8 consider Toledo Edison's analysis provided by Exhibit 2  
9 to the Creswell deposition; is that accurate?

10 A In this formal submittal, no, I did not. There  
11 was, I believe, an informal submittal made that we had  
12 some questions on, and I do not remember what those  
13 questions were right now.

14 Q When you say "we," is that NRR or Region III?

15 A Region III. We had a series of questions which  
16 we did not understand some of the statements.

17 Q Do you know if NRR performed any analysis  
18 to determine the accuracies of the Toledo Edison study,  
19 Exhibit 2 to the Creswell deposition?

20 A I think you have asked that question before.  
21 They analyzed it and to what extent they analyzed it,  
22 I do not know.

23 Q Were any conclusions reached in the  
24 December 20, 1978 telephone conference about loss of  
25 pressurizer level indication low?



1

2 A Yes.

3 Q What were they?

4 A There was one basic that <sup>it</sup> was not an ~~unresolved~~ <sup>unresolved</sup>  
5 safety question.

6 Q Was there a report following that telephone  
7 conversation?

8 A You mean was it formally documented?

9 Q Yes.

10 A No, it was not formally documented in the  
11 region.

12 Q Was it documented by NRR?

13 A I can't honestly remember what the documentation  
14 was that came out of NRR.

15 Q But they did provide some form of documenta-  
16 tion concerning that meeting.

17 A I believe that there was a letter to Low Rowe  
18 on acknowledging receipt of this and their review and  
19 asking a submittal of the details of the dual setpoint  
20 design change. I don't, offhand, remember exactly  
21 what that letter said.

22 Q Let me show you Exhibit 11 to the Foster  
23 deposition dated January 8, 1979 which is a memorandum  
24 to J. F. Streeter from J. S. Creswell, and ask you if  
25 you have previously seen that document.

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A Yes.

Q When did you first see that?

A I am afraid I can't recall exactly when I first saw it.

Q Was it before TMI 2?

A Yes.

Q Substantially?

A Substantially meaning one or two months?

Q Yes.

A At least a month, probably two months before.

Q So you believe you first saw Exhibit 11 to the Foster deposition sometime in the end of January, 1979. So that would be approximately two months before TMI 2?

A It is very possible. I don't know the exact date.

Q As a matter of fact, on the distribution of this exhibit, you were sent a copy; is that correct?

A That is correct.

Q Do you remember receiving a copy of this?

A Yes, and I still have my copy.

Q On Page 2 of Exhibit 11, No. 3, do you recall seeing those two paragraphs any place other than in this document?

1  
2 A The reference is to an inspection report 78-06.

3 Q Any place besides that?

4 A Yes, but I am trying to think where.

5 Q Could it have been as an attachment to  
6 IE Bulletin 79-05 issued April 1, 1979?

7 A It could have been but I was thinking of two  
8 previous items prior to that, and I can't remember off-  
9 hand what they were. It was covered in the licensee's  
10 submittal to bulletin where they were supposed to  
11 analyze previous -- re-analyze previous transients.

12 Q To determine what?

13 A They had changed any of their previous con-  
14 clusions.

15 Q In other words, where the loss of  
16 pressurizer level indication high was a problem?

17 A No. This was on this November 29, 1977 event.  
18 They also covered the other event in September 24, 1977.

19 Q Well, if we look at the second sentence on  
20 Exhibit 11 to the Foster deposition, Page 2, under  
21 No. 3, it states, "There are some indications that  
22 other B&W plants may have problems maintaining pressurizer  
23 level indications during transients."

24 A Yes.

25 Q That doesn't say "loss of pressurizer level

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indication low," does it? That is included, but it is not limited to a loss on the low side exclusively.

A I believe that to be the case, that they were concerning loss of pressurizer indication low.

(Continued on Page 119.)

1  
2 Q This sentence refers to transients at other  
3 B&W plants in addition to the November 29, 1979 problem  
4 at Davis-Besse; is that correct?

5 A That is correct. I do not believe that  
6 Mr. Creswell had specific knowledge at that time of  
7 these other transients, that this was more or less  
8 hearsay.

9 Q In Exhibit 3 to the Creswell Deposition,  
10 the October 25, 1978 report that you previously in-  
11 spected, we spent time discussing the second paragraph  
12 on Page 3 of that report, which deals with premature  
13 termination of the HPI system before the cause of the  
14 loss of reactor coolant has been determined, which also  
15 states that the matter is unresolved, have we not?

16 A We have discussed that before, yes.

17 Q And you received a copy of this exhibit,  
18 correct?

19 A Yes.

20 Q Exhibit 11 to the Foster Deposition is  
21 dated January 8, 1977, and you also received a copy  
22 of that?

23 A Yes.

24 Q The October 25 report, Exhibit 3 to the  
25 Creswell Deposition, refers exclusively to the incident

1  
2 on September 24, 1977 at Davis-Besse, does it not,  
3 Page 1 of the report itself, I believe, third line  
4 from the bottom?

5 A I don't see what you are talking about.

6 Q (Indicating.)

7 A All right. That is 78-27, Report No. 78-27.

8 Q Which deals with the September 24, 1977  
9 event?

10 A Right.

11 Q So this establishes that Mr. Creswell had  
12 already been involved with and had some degree of  
13 knowledge of that incident, does it not?

14 A But it also -- this Paragraph 3 of Exhibit 11  
15 references only the report 78-06.

16 Q By number, but he also refers to some  
17 indications that other B&W plants -- and I take the  
18 "other" to mean beyond Davis-Besse. Do you attribute  
19 a different meaning to that sentence?

20 A I do not disagree with that, but I disagree with  
21 your conclusion that you can draw a conclusion that  
22 he was referring to loss of pressurizer level indication  
23 high.

24 Q Well, it says "loss of pressurizer level  
25 indications during transients." It does not indicate



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one direction or the other.

A Okay, but the major item of concern at that time was loss of pressurizer level indication low, so I can only conclude that that is what he was talking about.

Q And you don't know why at the December 20 telephone conference, loss of pressurizer level high was not discussed?

A I have answered that question before.

Q Because it was dealing exclusively with the November 29, 1977 Davis-Besse problem?

A In which we were losing pressurizer level indication low.

Q But up until the time of that December 20 meeting, you were not aware of anyone requesting a resolution of loss of pressurizer level indication high to resolve that open matter?

A To the best of my knowledge, there was nobody in our region addressing that problem.

Q Besides Mr. Creswell?

A Mr. Creswell was not addressing that problem particularly.

Q Was he not addressing the problem of premature termination of the HPI system?

A Yes.

1  
2 Q And premature termination of the HPI system  
3 necessarily would result from an operator getting  
4 inaccurate readings from the pressurizer level indication,  
5 ~~would~~ <sup>would</sup> it not?

6 A You are drawing a conclusion that is not supportable  
7 at this point.

8 Q Why is it not supportable?

9 A You cannot say that by turning off the HPI pumps  
10 prematurely, it is necessarily the result of pressurizer  
11 level going high.

12 Q I didn't say "high"; I believe, Mr. Tambling,  
13 merely by pressurizer level indication, and the inaccura-  
14 cies involved in that being the primary method an  
15 operator uses to determine what is going on in the core.

16 A Well, I don't know. I think you are trying to  
17 read things into there that are just not there because,  
18 to the best of my knowledge, Mr. Creswell did not spe-  
19 cifically express a concern directly, loss of pressurizer  
20 level indication on the high side. The concern there  
21 was the fact that the procedure that they were using  
22 had an immediate step of having the operator block  
23 HPI flow.

24 Q I believe you previously stated that  
25 Toledo Edison prepared some analysis dealing with

1  
2 the HPI system on the September 24, 1977 transient; is  
3 that correct?

4 A They prepared a supplemental to the LER, yes.  
5 Could you read this question back?

6 (Record read.)

7 A (Continuing.) I don't think I said they prepared  
8 an analysis. I think it was compared to a depressuri-  
9 zation analysis that had been done by B&W.

10 Q Do you know if they prepared any analysis  
11 that compared the September 24 transient with their  
12 operating specifications to determine whether or not  
13 that was within acceptable limits?

14 A There was -- I do not believe there was any  
15 specific analysis made of the September 24 event, but  
16 that the pressure-temperature parameters during the  
17 event were compared with what they call their -- B&W  
18 calls their rapid depressurization analysis, and this  
19 is a generic type of analysis that is performed for the  
20 plant. They have a series of events that they analyze  
21 for various conditions, and when you have a transient,  
22 you compare the events to determine what they are  
23 classified in so that you can categorize them as to  
24 cycle requirements.

25 The plant is designed to take a certain number of

1  
2 cycles of various types of transients. So any time you  
3 have a transient, you have to determine what category  
4 does it fall in, and then have you have done that, then  
5 you say that is one cycle in that class of transients,  
6 and the plant is designed for so many of those during  
7 its lifetime.

8 Q In other words, one cycle is from start  
9 to finish of a transient?

10 A The particular depressurization transient, itself,  
11 is, I think -- the complete cycle on that is the  
12 sudden depressurization and also coming back to full  
13 temperature power conditions. That represents a full  
14 cycle.

15 Q Essentially from the last point the reactor  
16 was operating at normal power production, whatever that  
17 may have been, until it again gets back to that point;  
18 is that correct?

19 A That is one cycle, and this particular one event  
20 was classified as a sudden depressurization.

21 Q I believe on March 16, 1979, you were  
22 involved with a meeting in Region 3 with Mr. Foster.  
23 Mr. Kohler, Mr. Spessard, Mr. Norelius, Mr. Creswell,  
24 weren't you, second-floor conference room?

25 A Give me a little more information. What do you

1  
2 mean?

3 Q This was a meeting requested by "JFS,"  
4 which I believe to be Mr. Streeter, on March 15, 1979,  
5 to take place in the small conference room on the second  
6 floor in Region 3 for a debriefing session on an inves-  
7 tigation of Davis-Besse, presented primarily <sup>by</sup> to Joel  
8 Kohler. Does that ring any bells?

9 A I know there were some debriefings. I do not  
10 know whether I attended that specific one. I would  
11 have to look at my calendar to say that I attended  
12 the meeting.

13 Q Well, let me show you Exhibit 6 to the  
14 Kohler Deposition, which is a routing and transmittal  
15 slip, to see whether or not next to your name on that  
16 routing slip can provide any further information as to  
17 whether or not you actually attended the meeting.

18 A I initialed the routing slip, but I don't remember  
19 meeting in the small conference room. All I can remember  
20 was a meeting in Mr. Streeter's office.

21 Q When did that occur?

22 A I do not know when that occurred.

23 Q Was it before TMI 2?

24 A Yes.

25 Q In 1978 before the telephone conversation?

1

2 A No, this all occurred after the telephone conver-  
3 sation.

4 Q What did your conversation in Mr. Streeter's  
5 office relate to?

6 A Basically it was a discussion of what the findings  
7 were, the conclusions drawn, and a discussion as to  
8 whether or not the licensee should have an item of  
9 non-compliance on the low-voltage setpoint time delay  
10 relay.

11 Q It was the problem with the 4.16 KV voltage  
12 bus problem?

13 A Yes.

14 Q Was there any discussion of loss of  
15 pressurizer level indication at that meeting?

16 A The subject, the purpose of the investigation,  
17 and primarily the subject of discussion of the investi-  
18 gation was whether or not Davis-Besse had been covering  
19 up previous knowledge or something on this pressurizer  
20 level, whether they had been open with us in all the  
21 information, and the general conclusion was that there  
22 was no evidence that they had willingly or knowingly  
23 tried to withhold information.

24 Q So you were concerned with the timeliness  
25 with which they reported the problem?



2 A The timeliness with which they tried to resolve  
3 the problem. That was the primary thrust of the in-  
4 vestigation.

5 Q And the problem, as you are referring to it,  
6 is that dealing with the September or the November  
7 transient?

8 A That was the November.

9 Q No mention at this meeting of the September 24  
10 transient?

11 A I do not remember any.

12 Q Did you have a meeting in December 1978  
13 with Mr. Creswell, Mr. Streeter, that you can recall?

14 A December when?

15 Q 1978, where the three of you had a meeting?

16 A We had numerous meetings along to discuss various  
17 problems. I couldn't tell you, pinpoint any particular.

18 Q Well, let me try and refresh your recol-  
19 lection. Did you, at a December 1978 meeting with  
20 Mr. Creswell and Mr. Streeter, indicate that the  
21 September 24, 1977 transient at Davis-Besse produced  
22 an acceptable loss of pressurizer level indication  
23 which is off-scale high?

24 A I do not remember any discussion to that effect.

25 Q You just at this time cannot recall one

2 way or the other?

3 A No.

4 Q Do you recall any conversation in  
5 December 1978 concerning manual override of the high-  
6 pressure injection system during the September 24  
7 transient?

8 A At this particular moment, I can't recall one  
9 way or the other whether I had a particular discussion  
10 on that or not. The only thing I can say is that, as  
11 I have said before, I did not -- when you review the  
12 initial event, I did not consider that to be a major  
13 problem.

14 Q Do you know whether or not Mr. Creswell  
15 did consider it to be a substantial problem?

16 A No. Well, I don't remember it coming up until  
17 late 1978.

18 Q Before December 1978?

19 A I don't remember the details of just how it came  
20 up or exactly when it came up.

21 Q What came up, let me ask you that?

22 A Well, my recollection was the fact that they were  
23 reviewing the procedure, this emergency procedure for a  
24 small LOCA, and the fact that one of the immediate  
25 actions in there was for the operator to block the SFAS

1  
2 and take control of the high-pressure injection pumps,  
3 and I do vaguely remember a scenario that Streeter and  
4 Creswell were working on as to whether or not you could  
5 sit there and operate at low power with the pressurizer  
6 level valve cycling on and off without getting a reactor  
7 trip, but I don't remember the exact time frame of those.

8 Q So sometime, you believe, in the end of 1978?

9 A Could well be.

10 Q Do you recall any further discussion with  
11 either Mr. Creswell or Mr. Streeter after that time  
12 involving loss of pressurizer level high or manual  
13 override of the HPI system prematurely?

14 A The only thing I can remember right now was that  
15 I was at the site, and it seems like this was in  
16 January or February, and Jim Creswell asked me to get  
17 hold of a copy of the emergency procedure for him and  
18 to bring it back to see what the licensee had done.

19 Q Did you ask why he might want that  
20 information?

21 A My assumption would be it was to close out his  
22 open item.

23 Q You didn't have any conversation with him  
24 at the time he requested the information?

25 A No long conversation.

2 Q Well, in the short conversation you imply  
3 you had, was there any discussion about loss of  
4 pressurizer level indication high or manual override  
5 of the HPI system?

6 A There was no specific discussion on it, as I  
7 remember. He asked for a copy of the procedures.

8 Q So you told him you would provide it and  
9 that was that?

10 A That I would bring it back.

11 Q After that conversation, did you speak  
12 with Mr. Creswell and Mr. Streeter involving loss of  
13 pressurizer level high or manual override of the HPI  
14 system? .

15 A I don't remember any discussions about pressurizer  
16 level high.

17 Q What about manual override of the HPI  
18 system?

19 A Other than the ones that I have mentioned, those  
20 are the only ones that I can remember.

21 Q Do you know whether or not Mr. Knop was  
22 involved in any conversations at the end of 1978, the  
23 beginning of 1979, dealing with loss of pressurizer  
24 level indication high or manual override of the HPI  
25 system?

1  
2 A I have no knowledge that I can remember of him  
3 being involved in it.

4 Q Anyone else who you know of in Region 3 who  
5 might have been involved in conversation with either  
6 Streeter or Creswell or either one of them in one of  
7 those two subject areas?

8 A No, I do not remember any.

9 Q Have you spoken with any of the Nuclear  
10 Regulatory Commissioners concerning the events of  
11 September 24, 1977 at Davis-Besse?

12 A No, I have not. There is an NRC investigation  
13 team.

14 Q Investigating TMI 2 currently?

15 A Yes, and I have gotten several calls from gentle-  
16 men on that asking about this.

17 Q Loss of pressurizer level indication high?

18 A No, about the -- well, asking details on the  
19 September 24 event.

20 Q Any questions on manual override of the HPI  
21 system?

22 A I don't remember any questions on the manual  
23 override of that. One of his questions was whether  
24 there was a <sup>d</sup>discrepancy in some documentation he had  
25 as to when the HPI was secured and when it was restarted,

1  
2 a question on why didn't we recognize the sudden  
3 increase in level being a possible voiding in the core.  
4 I have no other answer than what I have told you.

5 Q Primarily because you had not previously  
6 experienced it?

7 A Basically.

8 Q Just it was a new phenomenon, and you  
9 really didn't know what you were looking for?

10 A I guess that is a fair assessment.

11 (Continued on Page 133.)

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1  
2 Q Do you remember any other conversations in  
3 Region III dealing with loss of pressurizer level indica-  
4 tion high or manual override of the HPI system that you may  
5 have learned about through office gossip or grapevine,  
6 whatever?

7 A No.

8 Q You did not participate in any?

9 A I don't remember.

10 Q Considering what we know about TMI 2, do  
11 you believe it would have been helpful to have considered  
12 loss of pressurizer level indication high and operator  
13 consequences that would flow from it which occurred  
14 initially at Davis-Besse on September 24, 1977?

15 A On hindsight, yes.

16 Q Do you think that had that information been  
17 considered in the context of manual override of the HPI  
18 system, it would have been helpful with reference to  
19 TMI 2, of course, again, on hindsight?

20 A It would have been helpful. The big question in  
21 my mind is why it took them so long to recognize that  
22 they had a failed pilot-operated relief valve.

23 Q Why it took TMI so long to recognize that?

24 A Yes.

25 Q Well, when you mentioned in your testimony

1  
2 earlier that you had PORV failed open on September 24,  
3 1977, was that information distributed to all B&W  
4 reactors, to the best of your knowledge?

5 A I do not believe it was primarily because the  
6 failure of the valve, itself, as I said, the other B&W  
7 plants had, I believe, Dresser-type valves and this was  
8 a Crosby valve, and what led to the initial control loss  
9 of it was the fact that this reset relay was missing  
10 out of that.

11 Now, that is a plant specific problem. That, in  
12 itself, is not a generic problem.

13 Q But at the time of the transient or shortly  
14 after when you became involved in it, you didn't know  
15 there was a difference in the two valves, did you,  
16 between Davis-Besse and the other B&W plants?

17 A There had been mention of the fact that there were  
18 differences in the conversations. I don't remember  
19 exactly when or where.

20 Q Well, looking back, would it not have been  
21 a more prudent course to report the PORV fail-open  
22 situation to the NRC and let them determine whether or  
23 not the difference between the two types of valves was  
24 of consequence in terms of whether they decided to  
25 inform other B&W plants?

1  
2 A Well, we did request the licensee to submit the  
3 supplemental report to the LER and the purpose of that  
4 was so that we would have a good documentation of all  
5 the problems and the parameters. That LER was avail-  
6 able to anybody who needed it to analyze what happened  
7 there.

8 Q Did anyone in Toledo Edison or Davis-Besse  
9 make any suggestion in reporting the December 24  
10 transient that it was the particular kind of PORV  
11 contributing to its failed-open position?

12 A I believe they covered the make of the valve and  
13 specifically what happened, and what corrective action  
14 they took. To the best of my knowledge, there was no  
15 specific discussions saying that this was really the  
16 only one that has this type of valve. All it was was  
17 a very direct statement, evaluation of their specific  
18 problem.

19 Q Were they more concerned with the fact that  
20 it was a Crosby design?

21 A No, they were more --

22 Q That it failed open or it was merely a PORV  
23 failure?

24 A They were more concerned that it was their valve  
25 that failed.

1  
2 Q With hindsight, again, does it appear as  
3 though had there been information provided concerning  
4 loss of pressurizer level indication high and manual  
5 override of the HPI system, it is entirely plausible  
6 TMI 2 would not have occurred?

7 A I would like to see the final analysis on TMI 2  
8 before I could answer that statement. I have a feel-  
9 ing that along the way there were several things that  
10 had they done it different, they wouldn't have had the  
11 fuel damage that they did, and I don't know from the  
12 standpoint that when they secured HPI pumps, whether  
13 that, in itself, really was the full culprit for  
14 causing fuel damage or not. Presumably they also  
15 had makeup pumps on still going through that period.  
16 I think we are going to have to wait and see what the  
17 final analysis is.

18 Q Certainly didn't help that they turned off  
19 the HPI system, did it?

20 A No, it did not help.

21 Q In fact, it probably hurt.

22 A Probably hurt.

23 Q At this time I don't have any further ques-  
24 tions, Mr. Tambling, but rather than adjourn the  
25 deposition, we are merely going to recess it in case

1 of some future time we do develop further information  
 2 and find it necessary to call you back for further  
 3 testimony. We are certainly going to try to avoid  
 4 that if at all possible, but rather than completely  
 5 end the deposition, we will leave it open.  
 6

7 Now, our previous procedure has been to  
 8 provide the deposition to you to make any changes or  
 9 corrections you may feel are necessary, and as I mentioned  
 10 earlier, any changes that we deem substantial will be  
 11 subject to challenge for your credibility, and we would  
 12 request that the deposition be signed after you do review  
 13 it and returned to us.

14 We have not generally been making a practice --  
 15 off the record.

16 (Discussion held off the record.)

17 MR. SIDELL: Back on the record.

18 Do you have any questions that you want  
 19 to ask?

20 MS. MOE: No.

21 MR. SIDELL: That being the case, the  
 22 deposition will be recessed.

23 (Deposition was concluded at 4:50 p.m.)

24 Subscribed and sworn to Thomas Tambling  
 before me this 20 day September 1979. THOMAS TAMBLING  
 25 of Sublet Jersey  
 Notary Public BENJAMIN REPORTING SERVICE

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I N D E X

WITNESS

DIRECT

Thomas Tambling 2

E X H I B I T S

TAMBLING DEPOSITION  
FOR IDENTIFICATION

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STATE OF NEW YORK )  
                          ) ss:  
COUNTY OF NEW YORK )


I, STEPHEN McCRYSTAL, a Notary Public  
of the State of New York, do hereby certify  
that the foregoing deposition of THOMAS TAMBLING,  
was taken before me on the 2nd day of July, 1979.

The said witness was duly sworn before the  
commencement of his testimony; that the said  
testimony was taken stenographically by myself  
and then transcribed.

The within transcript is a true record of  
the said deposition.

I am not related by blood or marriage to  
any of the said parties, 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 July 16 day of July, 1979.

  
\_\_\_\_\_  
STEPHEN McCRYSTAL