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PRESIDENT'S COMMISSION ON THE  
ACCIDENT AT THREE MILE ISLAND  
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DEPOSITION of NUCLEAR REGULATORY COMMISSION  
by NORMAN C. MOSELEY, held at the offices of  
the Nuclear Regulatory Commission 4350 East-  
West Highway, Bethesda, Maryland, on the 25th day  
of July 1979, commencing at 9:30 a.m., before  
Irwin H. Benjamin, Certified Shorthand Reporter and  
Notary Public of the State of New York.

*uncorrected*

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7 PRESIDENT'S COMMISSION ON THREE MILE ISLAND

8 KEVIN P. KANE, ESQ.  
9 Deputy Chief Counsel

10 ALSO PRESENT:

11 DWIGHT H. REILLY

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N O R M A N   C .   M O S E L E Y ,        having  
been first duly sworn by Mr. Kane, testified  
as follows:

DIRECT EXAMINATION

BY MR. KANE:

Q        State your full name for the record,  
please.

A        My name is Norman C. Moseley.

Q        Did you bring a resume with you today,  
Mr. Moseley, that briefly summarizes your employment  
and educational history?

A        Yes (handing).

Q        And does this accurately state your  
education and employment background?

A        Yes, it does.

MR. KANE: Let's have this marked as  
Exhibit 1 to today's deposition.

(Resume was marked as Moseley Exhibit 1  
for identification.)

Q        Mr. Moseley, what is your current  
position with the NRC?

A        I am the director of Division of Reactor  
Operations Inspection.

Q        And when did you become the director of

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2 Division of Reactor Operations Inspection?

3 A 1978.

4 Q And what was your position prior to  
5 that?

6 A Prior to that I was director of the Division  
7 of Reactor Construction Inspection.

8 Q When in 1978 did you become director  
9 of the Division of Reactor Operations?

10 A I don't recall exactly. It was in the late  
11 spring or summer. That doesn't have the date,  
12 specific date.

13 Q Would you briefly describe the function  
14 of Division of Reactor Operations Inspection and your  
15 duties as director.

16 A The Division of Reactor Operations Inspection  
17 is responsible for developing the inspection program  
18 for all reactors in operation.

19 In addition to that, we are responsible for  
20 determining that the inspection program is being  
21 implemented, and to assist the regional offices in  
22 resolution of technical problems that come up during  
23 inspection, and to provide a mechanism for feedback  
24 to other program offices of problem areas that need  
25 regulatory attention. And as the director, I am

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responsible to see that all these functions are carried out.

Q Would you explain to me how you go about developing an inspection program.

A Well, it has evolved. Our present inspection program has evolved over the years. The people that were hired earlier on in the program were all experienced in reactor operations in supervision of the operation of reactors. So, using this knowledge and experience, we developed a program that was based on an audit of the licensees' activities using the basic premise of our regulatory posture that the licensee is principally responsible for the safety of his operations.

Then we developed the audit program which then was designed to determine that a licensee was meeting his obligations in running a safe plant and observing the regulatory requirements.

Q When was that audit program first evolved?

A Whenever the first civilian plant came along, which would have been Dresden, I guess, back in the sixties.

Q In connection with that audit of

1  
2 licensees' activities, is it necessary to extensively  
3 examine Licensee Event Reports, for example?

4 A That's one of the things, yes.

5 Q What other aspects of that audit exist  
6 in terms of examining licensees' activities?

7 A It is an audit of all those activities that  
8 related to safe operation. For instance, we review  
9 the procedures which are prepared by the licensee to  
10 direct and instruct operators on how things are to be  
11 done. We don't review them all. We review a portion  
12 of them, and the review is to determine whether or not  
13 using these instructions, the person doing the job,  
14 whatever it might be, in using those, whether he would  
15 do the job safely, not necessarily the best way, but  
16 safely. We review the surveillance testing. Again,  
17 procedures. We also observe these activities being  
18 done.

19 We review log books and analyses of events  
20 that the licensee has. We review plant changes,  
21 modifications. In all these cases, when I say  
22 we review, you should read it or understand the  
23 audit. We don't do a hundred percent of all these  
24 things.

25 Q In reviewing safety, for example, how

1  
2 do you determine which instructions to look at?

3 A Well, there are general guidelines in our  
4 instruction manual. The blue books there (indicating)  
5 are the IQE inspection manuals. So in there, there  
6 are general guidelines, but they are very general  
7 and so the inspector takes a sample of those  
8 procedures that a licensee has and looks at them.

9 Q I see.

10 Is the focus in terms of selectively  
11 looking at those, are those instructions that would  
12 relate to safety related equipment?

13 A Yes.

14 Q Is there any focus at all on operating  
15 instructions for non-safety related equipment?

16 A Not specifically for non-safety related, no.

17 Q Would that be the same with regard to  
18 surveillance activities that are reviewed?

19 A Well, yes.

20 Q For safety --

21 A All of the things that we do are directed  
22 towards safety related things, and we ignore those  
23 things that are not safety related.

24 Q Why don't we come to that. How do you  
25 determine what is and what is not safety related



2 equipment in a plant?

3 A Well, we are guided, in part, by the Safety  
4 Analyses Report that is prepared by the licensee  
5 and is the basis of a review of the Office of Reactor  
6 Regulation.

7 We are guided by the technical specifications,  
8 and by our own knowledge and experience in reactor  
9 operations.

10 Q Are you also guided by 10-C, Part 50,  
11 I believe, Part B of --

12 A Appendix to Part 50 is a regulation which  
13 applies to quality assurance, and it says that this  
14 applies to safety related equipment, but it does not  
15 define what safety related equipment is.

16 Q But is that then a source for guidance  
17 for I&E as to what it determines to be safety related  
18 equipment?

19 A Yes. It is guidance as to how -- what things  
20 apply to safety related equipment. It is not guidance  
21 for what is safety related equipment.

22 Q And then you also look at the SER, the  
23 Safety Evaluation Report.

24 A Safety Analysis Report, yes, SAR.

25 Q And the SER?

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A Yes.

Q Anything else?

A Well, the technical specifications.. The specification 10-CFR's you mentioned is one specific part of one specific regulation, but all of the 10-CFR's that apply to reactor operations, which would be 50 and 20, principally.

Q How often are these audits of licensee activities conducted?

A There isn't a specified frequency. On the average, I believe that we do something on the order of about 25 to 30 inspections per year at each reactor.

[Continued on next page]



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2 Q Are those inspections conducted primarily  
3 by regional offices outside the Bethesda Area?

4 A Yes.

5 Q How many inspectors do you have nation-  
6 wide?

7 A I really don't know offhand. There are  
8 several hundred.

9 Q What kind of qualifications are the  
10 inspectors required to have?

11 A They are required to have the equivalent of  
12 a Bachelor's Degree in an engineering discipline, plus  
13 experience related to reactor operations.

14 Q The equivalent of a Bachelor's Degree?

15 A Yes. It's not necessary to have a Bachelor's  
16 Degree.

17 Q What would be an equivalent?

18 A An equivalent would be working experience  
19 which would be comparable to the knowledge that  
20 one would gain during the course work for obtaining  
21 this.

22 Q What kind of work experience?

23 A Well, it would be operating a reactor. It  
24 would include people from the Nuclear Navy Program,  
25 people from the Army Program. Most of the people --

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Moseley

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2 we have very few who do not have degrees, but  
3 the people who we do have who don't have degrees  
4 in general came from the Navy Program or the Army  
5 Program.

6 Q But you have very few who do not, in  
7 fact, have a formal Bachelor's Degree?

8 A That is correct.

9 Q What else is required besides a  
10 Bachelor's Degree or equivalent?

11 A Knowledge and/or experience in reactor  
12 operations or related to reactor operations. A  
13 person could have had experience in designing or  
14 engineering in support of reactor operations.

15 Q Where do your people customarily  
16 acquire that experience?

17 A In the programs that I have already mentioned,  
18 plus the National Laboratories, the facilities that  
19 are run by the Department of Energy, and operating  
20 power plants, or research reactors, in some cases.

21 Q How many of your inspectors in fact  
22 have been RO's or SO's?

23 A Licensed?

24 Q Yes.

25 A I don't have a number for you. There are some.

2 The majority of our people came from one of the  
3 military programs or the National Laboratories, and  
4 neither of these have formal license requirements;  
5 that is, issued by the NRC. They have requirements  
6 of their own.

7 Q In the military or the National  
8 Laboratories. What kind of experience do these  
9 people have in the military or National Laboratories  
10 that enables them to understand how a control room  
11 in a commercial nuclear reactor is laid out?

12 A Well, the control room for a nuclear power  
13 plant is rather complex, whether it has a power  
14 plant, an electrical generating station, hooked to  
15 it or not. I am not sure I answered your question.  
16 Maybe you should rephrase it.

17 Q What I am attempting to focus on, it is  
18 my understanding that there could well be substantial  
19 differences between military nuclear facilities  
20 and commercial nuclear power facilities. Let me  
21 ask you that first. Is that true?

22 A Yes.

23 Q What kind of experience would you get  
24 in National Laboratories that would relate to doing  
25 inspections at a nuclear power plant?

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2 A Well, the reactors are similar, and reactor  
3 operations are very similar. The differences, to  
4 the extent they exist, are in various feedback  
5 mechanisms that are associated with the power plant  
6 itself. We have training courses that we send our  
7 people to.

8 Q So that is in addition to the basic  
9 course?

10 A Yes. I was talking about the hiring qualifica-  
11 tions. We have in depth technical training courses  
12 in reactor theory and reactor operations including,  
13 as I said, simulator training.

14 Q Let's come to that, then. The hiring  
15 qualifications are what you just talked about, a  
16 Bachelor's Degree or equivalent or the background  
17 in the military programs. Once an inspector is  
18 hired, what kind of training does he go through?

19 A He goes through what we call basic technology  
20 training and then an advanced course that is related  
21 to the specific type of reactor that he is going to  
22 inspect and the simulator. And there is retraining  
23 on a periodic interval in these areas.

24 Q Let's take the basic technology. What  
25 is that?

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2 A I would really rather you talked to the people  
3 who are associated with the training program if you  
4 really want to understand, because they can give you  
5 a much better picture of what all the contents of this  
6 particular course is. I think you will get a better  
7 feedback.

8 Q We will be talking to Don Skovholt this  
9 afternoon.

10 A Talk to Jack Ledoux. I direct you to him. He  
11 is the guy who is in charge of the training program,  
12 and he can give you a very good handle on just what  
13 it is we train people on, what each of the courses  
14 contains and so on.

15 Q L-e-d-o-u-x?

16 A That's right.

17 Q Beyond that, I would like to know your  
18 understanding of what the basic technology course  
19 is, how long it is, and what it is composed of.

20 A Well, it's about three weeks in length, and  
21 it's the traditional reactor technology, what are  
22 the basic components of a power plant, how radio-  
23 activity is controlled, what the transients of con-  
24 cern are, how the plant is designed to handle these  
25 transients, these kinds of things.



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2 Q That is given for three weeks? Where  
3 is that course given?

4 A Here.

5 Q In Bethesda?

6 A Yes.

7 Q Then you mentioned the advanced course.  
8 Is that required after the basic technology course?

9 A Yes. I believe that is two weeks. These  
10 times may be wrong. I may have them switched.  
11 There is another course that is about two weeks,  
12 which would be more advanced and would be more  
13 related to a specific, like Westinghouse plant.

14 Q At that point, the inspector begins  
15 to specialize?

16 A He begins to specialize. Let me back up and  
17 say, I think those courses are specialized in PWR's  
18 and BWR's.

19 Q Does each inspector get training in  
20 both, or does he choose?

21 A He may not make the choice. A choice is  
22 made, and he goes to one or the other, and many  
23 of the people have been to both.

24 Q You are saying many people have been  
25 to both?

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2 A Yes.

3 Q They have come back and redone the course,  
4 or taken both at the same time?

5 A They have been to both PWR and BWR training.

6 Q Simultaneously?

7 A No, they are different courses. The full-time  
8 is eight hours a day, plus for the period of time  
9 that you are there, so they have been at different  
10 times to the PWR course and the BWR course.

11 Q That is a 2-week course and, again, that  
12 focuses basically on how the PWR or BWR works?

13 A It's more specific to these types of  
14 reactors, that's right.

15 Q Then you mentioned a simulator training  
16 as well?

17 A I believe that's about seven days, and it is  
18 located -- I believe the PWR simulator that we go  
19 to is in Illinois, that we rent time from. I'm not  
20 sure whether it's GE or what. We also go down to  
21 Chattanooga. We rent time from TVA.

22 Q For PWR simulator?

23 A Yes.

24 Q What takes place during the simulator  
25 training?



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A Well, it's a specialized course that is set up for our inspectors that goes through the normal operation sequence startup, as well as observing and participating in handling transients.

Q Startup and observing?

A Well, in the simulator, every student doesn't do every evolution. Some of the stuff is done by the instructor doing some evolution and stopping it and explaining to the student what is happening and starting it again, and that kind of thing. Then, in addition -- that's part of every simulator. Then the student is put on the board. He's the operator and the instructor causes the simulator to do certain things and requires the operator, the trainee, to respond, to manipulate the controls to counteract whatever it is that the instructor has put in.

Q Is each student required to sit at the board and --

A I don't know that detail.

Q You mentioned retraining. There is a periodic retraining for inspectors?

A Yes.

Q Why is there the necessity for retraining of inspectors?

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2 A It's necessary to retrain in most any field.  
3 People need to be refreshed, and so we have a  
4 program that does that.

5 Q On the other hand, these inspectors  
6 are out in the field from the time they finish the  
7 training doing inspections, aren't they?

8 A Yes.

9 Q That is on a fairly constant basis, so  
10 one would assume they are staying proficient?

11 A I would presume so.

12 Q There is still the need for retraining?

13 A Yes.

14 Q Is the retraining simply covering things  
15 previously covered in these basic courses and  
16 simulator training?

17 A It's basically the same kind of training, but  
18 the value of retraining is that there are a lot of  
19 things you do not see in a period of time and,  
20 therefore, to have these things refreshed in your  
21 mind is useful.

22 Q In other words, to remind the inspectors  
23 of things they may not have encountered on the field?

24 A Yes.

25 Q How long is the retraining conducted?

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2 A I believe it's about every two to three years.  
3 Again, Jack Ledoux can fill you in on that much  
4 better.

5 Q How long is the retraining course?

6 A About a week.

7 Q Where is that done?

8 A The classroom-type stuff would be done here.  
9 The simulator stuff would be done at the same place  
10 as I mentioned.

11 Q How is it determined whether or not the  
12 person should go for retraining on the BWR simulator  
13 or PWR?

14 A It depends on what his current job assignment  
15 is. If he is inspecting BWR's, he would go to BWR.

16 Q So, from what you said before, some  
17 inspectors in fact wind up working on BWR's for a  
18 while and then are transferred?

19 A That's a possibility.

20 Q Does it also appear that inspectors  
21 wind up doing both at the same time?

22 A I can't say that it doesn't. It's not  
23 normally done.

24 Q Normally, an inspector is either  
25 working on PWR's or BWR's?

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2 A That's correct.

3 Q Is there any specialization as to types  
4 of plants, Westinghouse, B&W?

5 A I'm not sure how much the current training  
6 program specializes in those. I would refer you to  
7 Jack Ledoux.

8 Q Are you aware that there is any specializa-  
9 tion at all?

10 A I really don't know.

11 Q It is my recollection from glancing  
12 over your resume, that at one time you were a  
13 reactor inspector.

14 A Yes.

15 Q At that time, were reactor inspectors  
16 assigned to particular kinds of plants?

17 A At that time, when I first started in reactor  
18 inspection, the reactor inspectors inspected any  
19 type at any time in their history. In other words,  
20 the same guy would inspect construction as well as  
21 operation inspection.

22 Q So there was no particular differentiation  
23 between kinds of plants?

24 A There was none.

25 Q Do you have any reason to think that

2 situation has changed since then?

3 A Well, yes, I'm aware that in general, the  
4 regions: attempt to assign people by type, but  
5 smaller regions where there may not be enough  
6 reactors of a particular type, there may be some  
7 crossover. In larger regions, it's my understanding  
8 that in general, a person will specialize in a type  
9 by assignment.

10 Q When you say "by assignment," do you  
11 mean you might have an assignment of Westinghouse  
12 for one week and B&W the next?

13 A No, I'm talking about the -- we have got to  
14 become a little more specific. The things that I  
15 have talked about were related to the principal  
16 inspector being the person who has the overall  
17 coordination for all of the inspections at a plant  
18 and the specific assignment for certain parts of the  
19 inspection. We have also people who are called  
20 specialists or are specialists, and they may inspect  
21 their area in a number of different kinds of  
22 transients. If an individual is specializing in  
23 electrical instrumentation inspections, he may do  
24 that at all types of reactors.

25 Q Westinghouse, B&W?



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A That's correct.

Q There are significant differences between the plants as to electrical instrumentation?

A The basic instrument theory that is used is the same. A pressure transmitter is a pressure transmitter. A temperature indicator is the same thing. So the basic instrumentation technology is the same. The application may be different.

Q You said you had principal inspectors?

A Yes, the principal inspector is, as I said, the guy who is responsible for doing a portion of the inspection himself. He is also responsible to coordinate schedules and see that inspections are done in all the other areas in accordance with our required inspecting program.

Q So he is both a supervisor --

A He is not a supervisor. He is a coordinator.

Q So he coordinates inspections by other inspectors?

A That's right.

Q Who report to him?

A No, he is not a supervisor. They report to their own supervisor. What he does is -- the schedule says, "During the next two months, the

1  
2 following inspection modules need to be done."  
3 He notifies either his supervisor or the supervisor  
4 of the people that do that inspection so they can  
5 schedule this during that time frame to be done, and  
6 he is aware of when they go. At times he goes with  
7 them. He is aware of their findings, he will be  
8 responsible for continuing pursuit with the licensee  
9 management of any problems that are identified as a  
10 result of those inspections.

11 Q Do principal inspectors specialize as to  
12 type of plants?

13 A Yes, in general, but not in every specific  
14 instance.

15 Q Then you mentioned another type of  
16 inspector, something between specialist and principal  
17 inspector, the people who are coordinated by the  
18 principal inspectors?

19 A No, those are specialists. There are basically  
20 two types.

21 Q Principal inspectors and specialist  
22 inspectors?

23 A Yes.

24 Q The specialist inspectors do not, by  
25 and large, specialize as to type of plant?



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A Well, they may. It depends on what their specialty is. The one that I chose was the instrumentation type, electrical instrumentation type. In another case, a guy may be a specialist in preoperational testing for PWR's. He may then do a preoperational inspection of the procedures in observed tests, and so on, for those plants.

Q Would he also specialize in preoperational testing for a Westinghouse plant as opposed to B&W?

A I don't think you will find that kind of specialty, because we do not have that many plants starting up in any one region in any one period of time.

Q Would specialist inspectors, however, in some instances, at least, specialize as to type of plant; that is, as to manufacture, Westinghouse, B&W, as opposed to simply specializing in PWR's versus BWR's?

A I think most of the specialty will be in PWR versus BWR.

Q In the case of principal specialists, they do not specialize in manufacture?

A In general, but not specific.

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Q In the larger regions, they tend to

do that?

A Yes.

Q Does that pose any problems for the inspection process, to have two or three different kinds of plants in operation?

A What do you mean by "problems"?

Q Well, I mean in terms of the fact that you have to have people who know one kind of plant as opposed to another. If you have a shortage of people in one, you have to transfer them over. If somebody changes his job location or his job description, he has to learn new things about plants that he has not been previously familiar with.

A In that regard, yes.

Q It makes the job more complicated, doesn't it?

A Yes.

Q Does it also lead to a situation where some plants will have more advanced safety features than others?

A I don't believe -- Your question is, does the fact that there are several different types of plants lead to plants having a more advanced

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safety feature?

Q In some than in others?

A I think that the more important factor is age of the plant. I think that the more recent plants almost always have more advanced equipment, whatever type, whoever.

[Continued on next page.]

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2 Q You don't think that there is a  
3 difference between respective NSSS suppliers  
4 for plants as to sophistication on safety equipment?

5 A I don't perceive that to be a principal  
6 difference between the plants, no.

7 Q Let us take an example. A position  
8 indicator for PORV's that has come up several times  
9 in the last few months, as a result of the TMI-2  
10 incident on March 28, 1979. How many plants around  
11 the country have a position indicator for the PORV?

12 A I really don't know.

13 Q Do you know if anyone does besides TMI-2?

14 A - Of my personal knowledge, I don't know. I  
15 presume, and I am positive that there are others that  
16 do, but I don't have personal knowledge.

17 Q Do you know if TMI-1 has a position  
18 indicator on the PORV?

19 A I don't know.

20 Q Do you know if Davis-Besse 1 has a  
21 position indicator on the PORV?

22 A I don't know.

23 Q If I told you that Davis-Besse 1 has an  
24 actual position indicator on the PORV, and as you know,  
25 TMI-2 has a command signal indicator on the PORV,

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2 would that suggest to you that there are some  
3 incongruous differences between the instrumentation  
4 of the plants?

5 A It would suggest to me there are differences,  
6 which I certainly am well aware there are differences.  
7 I don't take from your example, I can't draw from  
8 that, the larger conclusion that, therefore, that  
9 this plant is safer than that plant. I can't make  
10 that conclusion.

11 Q Have you examined the Lessons Learned  
12 interim report that has now been issued?

13 A Yes.

14 Q Do you recall in there that it is now  
15 recommended that there be an actual indicator --

16 A I support that.

17 Q Do you support that on the basis of  
18 safety?

19 A Yes.

20 Q Does it then indicate to you that a  
21 plant that does not have an actual position indicator  
22 and only has a command signal indicator on the PORV,  
23 that it is less safe than one that has an actual  
24 position indicator?

25 A That's too simple a piece to make the big



1  
2 thing that you are attempting to lead to. There are  
3 a lot of things that affect safety.

4 Q Yes. I understand that.

5 A Yet, that's the right thing to do, and I think  
6 it should be done.

7 Q Let us return back for a minute. I read  
8 Lessons Learned, and the reason that the recommenda-  
9 tion was being made for installing an actual position  
10 indicator is that it is more safe; is that correct?

11 A Yes.

12 Q And that lesson was learned from TMI-2  
13 that we need that kind of thing?

14 A - Yes.

15 Q Therefore, I simply ask you, if a plant  
16 has an actual position indicator for its PORV, is  
17 that plant safer than a plant that has a command  
18 signal indicator only for the PORV?

19 A Yes, but it may be safer by that much [indicat-  
20 ing] out of so [indicating], a very large amount.  
21 I can't quantitize that.

22 Q I don't want you to quantitize it, I  
23 just want you to --

24 A There is an increment of increase, otherwise  
25 there wouldn't be any recommendation to make this.

2 Q And, in fact, that's the basis for the  
3 recommendation in Lessons Learned?

4 A Yes.

5 Q I guess I forgot to indicate at the  
6 beginning of the deposition, Mr. Moseley, that the  
7 reporter can't take down both of us at the same time,  
8 so please allow me to finish my questions before you  
9 respond, even if you know what the question is going  
10 to be. The only reason for that, so we can have a  
11 very clear record here.

12 Let me also remind you, as I did at the  
13 beginning, although we are sitting here in the  
14 relative informality of your office, the testimony  
15 you are giving here does have the same force and  
16 solemnity as if you are testifying in a court of law.  
17 The reporter is taking down my questions and your  
18 answers, and that will be reduced to booklet form  
19 later on. You will be given an opportunity to make  
20 changes. However, it is very important to avoid  
21 the necessity for changes, as much as we can, and,  
22 for that reason, if at any time you are confused  
23 about a question and you don't understand it, and  
24 you need some clarification, please feel free to  
25 stop me and ask at that point.



1

2 A Okay.

3 Q Are there any other safety differences  
4 that you are aware of between different types of  
5 plants around the country? We are talking about  
6 PORV indicators, for example. Are there other  
7 differences between plants that relate to safety of  
8 which you are aware?

9 A There are obviously other differences in  
10 plants. There literally are no plants that are  
11 exactly alike.

12 Q I understand that. That's what I  
13 perceive to be something of a problem for the  
14 inspection and enforcement function, isn't it?

15 A Yes.

16 Q Because it makes the job, as you said,  
17 very complicated.

18 A It makes it more difficult, yes.

19 Q What I was talking about is what  
20 differences there are that relate to safety.

21 A Well, I can certainly say that there are  
22 things. If you're next going to ask me to list  
23 them, I can't do it.

24 Q Please don't try to anticipate my  
25 next question. The first question is, are there

1  
2 differences between plants that relate to safety?

3 A I have answered that. Obviously, there are.

4 Q Okay. What differences?

5 A I can't --

6 Q I don't want you to list them, but tell  
7 me what differences you have in mind.

8 A I don't know how to answer the question that  
9 you asked.

10 Q Maybe I can rephrase it. There are  
11 differences in plants that relate to safety, differences  
12 in, I take it, equipment of various kinds.

13 A Yes.

14 Q What differences in equipment do exist  
15 that can relate to safety from one plant to another,  
16 based on your experience?

17 A I simply can't enumerate these things.

18 There are lists of items that are under review.  
19 The generic issues are examples of things that  
20 represent questions where there are differences.  
21 There are questions that have been raised as to  
22 whether or not this is good enough, or whether or  
23 not other things ought to be changed, but --

24 Q I don't know that I was talking about  
25 generic issues. If I understand it, the generic

2 issue is an issue of safety that applies to more  
3 than one plant, is that right?

4 A Yes.

5 Q As a matter of fact, it usually applies  
6 to a large number of plants?

7 A More than one would suffice.

8 Q More than one?

9 A Yes.

10 Q What I was trying to focus on, was  
11 differences between plants that relate to safety.  
12 One plant would be safer than another. That may or  
13 may not relate to a generic issue of safety as well,  
14 but the point is, in your experience, are there  
15 differences, for example, between B&W plants and  
16 Westinghouse plants that you relate to safety?

17 A Well, I think I can answer that specific  
18 question if I say that our approach really is not  
19 to try to determine what is the absolute safest in  
20 terms of how something is done, but rather is in  
21 terms of is it adequately safe. Then I think that  
22 will context where we actually operate on a day-to-  
23 day basis as opposed to a review which will be to  
24 say, well, if you did this much more, you will be  
25 this much safer. We simply don't operate in that

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realm.

Q        However, doesn't inspection and enforcement focus on margin of safety of plants?

A        It does in a sense. If we raise a question of is what we find, is that safe enough, I guess that is a question of margin, but not in any specific terms of how much is the margin.

Q        We were just talking about margins of safety, and I gather from your response, what you were suggesting is that there is a minimum line to which I&E looks for purposes of safety.

Is it my understanding that I&E is not concerned with how far over that line a particular plant goes, as long as it meets that line?

A        In general, that is correct. The question of how safe is safe enough is obviously a very difficult one to answer and we sometimes have to resolve our differences by saying this is safe enough.

Q        I understand that. According to your resume that you have produced, and that we have marked as Exhibit 1, you have been with NRC since 1964, is that right?

A        That's correct.



1  
2 Q Over the course of those years of  
3 experience, I see you had experience from '64 to  
4 '71 as a reactor inspector and a senior reactor  
5 inspector. Was it your observation that some plants  
6 do go further over that minimum line of safety than  
7 others?

8 A Yes.

9 Q And what facets of the plants led you  
10 to that observation, what things that you look at  
11 that indicate to you that that was the case?

12 A I think it is more a general perception than it  
13 is something that, because of this piece of equipment  
14 or lack of that piece of equipment, it is more a  
15 general perception.

16 Q Well, a general perception is usually  
17 based on things that you have seen. What kind of  
18 things, I'm not asking for an exhaustive list, but  
19 how about something illustrative of what you have  
20 seen that gives you that kind of general perception?

21 A Well, I am not sure that I can answer that on  
22 the basis of my inspection experience. I certainly  
23 note that -- let us take the B&W plants that have  
24 the sealed loop, and the smaller pressurizer.

25 These things, I believe, tend to make this



2 plant more sensitive to transients, and require,  
3 or let us say, challenge the safety systems more  
4 frequently than plants of other design.

5 That's a specific that I can relate, perhaps.

6 Q You mentioned the sealed loop. Is that  
7 the once through steam generator design?

8 A No, it has to do with the piping arrangement  
9 between the steam generator and the reactor, and  
10 also between the pressurizer and the reactor.

11 Q And it has been your observation that  
12 that makes the plant more sensitive to transients?

13 A Yes.

14 Q How do you mean sensitive to transients?

15 A Well, the B&W design philosophy has been,  
16 was in the past, do not have anticipatory SCRAMS  
17 on problems in the secondary system, relying, rather,  
18 on the resulting reaction of the primary system to  
19 cause a SCRAM if the SCRAM was sought to be needed  
20 at that period of time.

21 For instance, loss of feedwater did not  
22 directly cause a SCRAM previously in B&W plants.

23 The result of loss of feedwater always gave  
24 a high pressure in the primary system. This, of  
25 course, causes a SCRAM, which meant that a transient

2 in the secondary system would perturbate the  
3 primary system rather than directly scrambling,  
4 as the other B&W designs have done all along.

5 Q Is that the B&W philosophy as to its  
6 plants today, do you know?

7 A The plants have been required to install the  
8 anticipatory scram since Three Mile Island.

9 Q They have been required to install the  
10 anticipatory scram?

11 A Yes.

12 Q In what sense?

13 A They now have a scram on feedwater loss  
14 directly.

15 Q How is that accomplished?

16 A It is a matter of installing instrumentation  
17 to sense it and feed a system, signal it into the  
18 reactor scram.

19 Q Did that have anything to do with  
20 the adjustments in the PORV?

21 A That was another facet of it. In response  
22 to the bulletins and orders that were issued at  
23 B&W plants, one of the things that they were  
24 required to do was to increase the setting of the  
25 PORV to make it closer to the code safety valve

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Moseley

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2 setting, and, at the same time, reduce the setting  
3 on the high pressure reactor scram and thus reduc-  
4 ing the number of times that the PORV would be  
5 required to operate to terminate a pressure excursion.

6 Q You also mentioned the sealed loop  
7 configuration. Has anything been done since TMI-2  
8 and the --

9 A No.

10 Q Are you familiar with the once through  
11 system generator configuration used in B&W plants?

12 A Yes.

13 Q And you are also familiar with the re-  
14 circulation steam generator configuration generator  
15 used in Westinghouse plants?

16 A Yes.

17 Q Are there significant differences between  
18 the two in the amount of reaction time that is  
19 accorded to an operator in the event of a loss of  
20 feedwater, for example?

21 A Yes. The once through steam generator, in  
22 fact, produces super heated steam which means that  
23 some of the tubes in the steam generator are dry  
24 in normal operation, and the water level, the amount  
25 of water inventory in the secondary system on the

1  
2 once through system generator is small in comparison  
3 to that in the other steam generators. So that  
4 wider fluctuations in primary coolant system  
5 temperature result from level changes in the once  
6 through steam generator.

7 Q Does that lead to a situation where the  
8 once through steam generator will boil dry more  
9 rapidly than a recirculation steam generator in the  
10 event of a loss of feedwater?

11 A Yes. Because part of the steam generator is  
12 dry anyway, and in once through, yes, the smaller  
13 inventory in the steam generator will cause it to  
14 boil dry sooner.

15 Q That will then lead to a situation that  
16 requires immediate operator reaction, will it not?

17 A Well, it requires some action. It is not  
18 necessarily operator action. That's not the only way.

19 Q Does it place upon the operator a burden  
20 of responding more quickly in the event of a problem  
21 with the once through steam generator as opposed to  
22 the recirculation steam generator?

23 A Yes. If you presume that everything doesn't  
24 work, he has less time to right those wrongs.

25 Q So if I understand it, then, this

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recirculation steam generator, there is a wider margin of protection against transients or reaction requirements on the part of the operator?

A Well, I would state that there is more time for actions to be taken.

Q Because there is more water?

A Because there is more inventory, therefore, that gives you more time to take actions, whether it be automatic or operator initiated.

[Continued on next page.]



1  
2 Q When you say "inventory," you mean coolant,  
3 water?

4 A Yes.

5 Q Had there been any suggestion that B&W  
6 changed that particular configuration within NRC?

7 A Not to my knowledge.

8 Q Do you think that might be a good idea?

9 A I really haven't studied that, and I would not  
10 be in a position to render an opinion.

11 Q What is the reason for having a once-through  
12 steam generator?

13 A Well, it is principally to provide the super  
14 heat by having a super-heated steam. By producing  
15 super-heated steam, you get more efficiency out of the  
16 total system.

17 Q How much more efficiency?

18 A It is a few percent, I can't give you exact  
19 numbers.

20 Q One or two percent, something like that?

21 A A few.

22 Q Less than five?

23 A On that order, yes.

24 Q So less than 5 percent more efficiency,  
25 if I understand it then, B&W had elected to use the

1  
2 once-through steam generator which calls upon them to  
3 move much more quickly in an event of loss of feed-  
4 water, for example, than would be the case with the  
5 Westinghouse recirculation --

6 A I don't know that's the only reason. That's  
7 the reason that is obvious to me.

8 Q Do you know of any other reasons?

9 A I don't know of other reasons, but I don't know  
10 that other reasons do not exist, either.

11 Q Has NRC performed any evaluation on a  
12 cost benefit basis, if you will, of balancing that kind  
13 of efficiency against the problems that that kind of  
14 configuration can create for operators?

15 A I don't know of any cost benefit analysis, but  
16 there could have been, and I would not be knowledgeable  
17 of that.

18 Q Inspection & Enforcement would --

19 A That would be outside of our area of responsibility.

20 Q It would be the function of Inspection &  
21 Enforcement to give greater attention to transients at  
22 plants that have a once-through steam generator in order  
23 to analyze how that system is performing and whether or  
24 not it poses safety problems as opposed to other plants?

25 A It is not clear to me that there was a thorough

1  
2 appreciation for the sensitivity of the B&W plants  
3 prior to the Three Mile Island event.

4 Q You think that sensitivity does exist now?

5 A Yes.

6 Q But, to your knowledge, there has been no  
7 look at the once-through steam generator within NRC?

8 A I don't know whether it's been made or not.

9 Q It is not covered, as I recall, in the  
10 Lessons Learned Interim Report, at least.

11 A But there are other things going on, so I wouldn't  
12 want to rule it out. I just don't know.

13 Q Is Oconee Unit 3 in South Carolina a B&W  
14 plant?

15 A Yes, it is.

16 Q Does it have a once-through steam generator?

17 A Yes.

18 Q In the interview that we had with you,  
19 Mr. Moseley, some days ago, I did provide you with a  
20 copy of a letter dated August 8, 1975, directed to you  
21 at the time that you were working in Atlanta, Georgia.  
22 I guess at that time you were with Region I?

23 A II.

24 Q I'm sorry, Region II, as a director of that  
25 region, and this was a letter from Duke Power Plant,

1 signed by Mr. William O. Parker, and it describes a  
2 transient which occurred at Oconee Unit 3 on June 13,  
3 1975.  
4

5 During the interview I asked you if you  
6 could follow up to determine what response had been  
7 made by you or someone from Region II to this letter.

8 Did you make that determination?

9 A I hadn't done that yet. I have asked my staff  
10 to gather that information so I could look at it, and  
11 I hadn't gotten it.

12 Q Do you recall this transient of June 13,  
13 1975?

14 A I do not.

15 Q Do you recall it involved problems with the  
16 PORV?

17 A I don't recall it at all.

18 Q It is also described in the Tedesco report  
19 New Reg 0560?

20 A Yes.

21 Q Do you recall reading about it in there?

22 A I have read the Tedesco report, but I don't have  
23 any specific recollection of that particular event.

24 Q To your knowledge, did this transient raise  
25 any generic safety issues which had to be addressed in

1  
2 connection with B&W plants?

3 A I really don't have any recollection of that  
4 specific event.

5 You pointed out to me, I will look into it.  
6 I just have had --

7 Q Okay.

8 MR. KANE: Let us have this marked as  
9 Exhibit 2.

10 Q If you could follow it up, Mr. Moseley,  
11 and provide us with whatever documentation that was  
12 prepared in response to this letter, we would certainly  
13 be appreciative of that.

14 A I intend to do just that.

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

17 Q Are you familiar with the transients which  
18 occurred at Davis-Besse 1 in 1977 involving PORV and  
19 pressurizer level aberrations?

20 A Yes, in some amount of detail.

21 Q They are also described in the Tedesco  
22 report?

23 A Yes.

24 Q One of them occurred in September of 1977,  
25 on September 24, 1977. Are you familiar with that



1 transient?

2 A Is that the one where the PORV stuck open?

3 Q That's correct, and there is also one  
4 where the pressurizer level rose as a result of that  
5 situation.  
6

7 When did you first become familiar with  
8 that particular transient?

9 A My first recollection of any attention to that  
10 particular transient was in response to the Creswell  
11 request. I believe that was a specific event that he  
12 based his recommendation on.

13 Q When did you become aware of that?

14 A . It would have been sometime in the latter part  
15 of last year or first of January, December of '78 or  
16 January of '79, in that time period.

17 Q How did that come to your attention?

18 A It came to my attention as a result of a letter  
19 which Jim Keppler addressed to Thornburg and myself.  
20 That letter was dated January 19th.

21 Q Let me show you a document that has been  
22 marked as Exhibit 10 to the Foster deposition previously  
23 taken in connection with this Commission's investigation,  
24 and ask you if that's the letter you are referring to.  
25 It actually appears to be a memorandum.

1  
2 A It appears to be the same, yes. Wait a minute,  
3 no, it isn't.

4 Q I note you are looking at something else  
5 there.

6 A Yes.

7 Q Can I see what you have in front of you  
8 there, I don't recognize that.

9 MR. CHOPKO: It is the same without  
10 attachments.

11 THE WITNESS: The words look like they're  
12 different. It looks like this was redrafted to  
13 become this. That's my best guess.

14 MR. CHOPKO: I think just the top of the  
15 page is cut off.

16 MR. KANE: It doesn't appear to be the same.

17 MR. CHOPKO: I think it is the same, just  
18 the top of the page --

19 MR. KANE: What is all this stuff at the  
20 bottom?

21 THE WITNESS: This is from a file copy.  
22 This stuff is on the file copy, and it is not on  
23 the original. Maybe it is the same.

24 MR. KANE: Can we have this marked as an  
25 exhibit, or is that your only copy?

1  
2 MR. CHOPKO: I can get a copy for you.  
3 I can give you this one.

4 MR. KANE: We can refer to this. The  
5 reporter will need to take it with him. Can  
6 we have that marked as Exhibit 3?

7 (The above-described document was marked  
8 Moseley Exhibit 3 for identification, this date.)

9 Q This is a memorandum which you received  
10 from Mr. Keppler of Region III. It is dated  
11 January 19, 1978. You did say your recollection was  
12 that this first came to your attention in late '78 or  
13 early '79?

14 A Having seen this date, I would say that it was  
15 in early '79.

16 Q That is towards the end of January '79?

17 A Yes.

18 Q Was that the first notice you had of any  
19 concerns being raised about a transient at Davis-Besse  
20 on September 24, 1977 and generic problems that might  
21 be connected with that?

22 A To the best of my recollection, yes.

23 Q And this was a request or recommendation  
24 for notification of Licensing Boards and a request  
25 for technical assistance, is that right?

1  
2 A It was a specific request from Creswell. The  
3 specific request that Mr. Creswell made was for notifi-  
4 cation of the board.

5 In forwarding this, Mr. Keppler made recommenda-  
6 tions that other things other than notification of the  
7 board might be more appropriate in this.

8 Q What were those recommendations?

9 A It would seem more effective and less premature  
10 of handling this information and so on.

11 Q You were referring to Page 2 of this docu-  
12 ment, and at the top in the second sentence from the  
13 top it says, "It would seem that a more effective and  
14 less premature way of handling this information would  
15 be for NRR to review and disposition the information  
16 during the development of the SER and SER Supplement  
17 relating to OL issuance for the affected plants."

18 A Yes.

19 Q What is that procedure that he is talking  
20 about there?

21 A Well, it is not a defined procedure, but what it  
22 would amount to would be to refer this to the licensing  
23 project manager to specifically address these issues in  
24 the SER.

25 Q For what plant?

1  
2 A For the plants that an SER remains to be written  
3 on. So it would be a plant where there is a licensing  
4 action that is pending.

5 Q Not for any plants that have already been  
6 licensed?

7 A A plant for which there was not an SER pending,  
8 this was not appropriate.

9 Q How long would that mechanism take that  
10 Mr. Keppler is suggesting would be a more effective and  
11 less premature way of handling the information?

12 A Well, it would vary with the length of time before  
13 the SER was issued for a specific plant. It might be  
14 a month or two, or it might be many months.

15 Q Did you review this document at the time  
16 you received it?

17 A Yes, I did.

18 Q Did you understand the nature of Mr. Creswell's  
19 concerns at that time?

20 A Well, I understood or I thought I understood what  
21 Mr. Creswell's concerns were, and specifically in rela-  
22 tion to the pressurizer, I took Mr. Creswell's concern  
23 to be that he thought the pressurizer was too small,  
24 and that he had some concern about the level instrumenta-  
25 tion associated with pressurizer.



1  
2 Q You were referring to Page 2 of the  
3 memorandum which is attached to the cover letter, the  
4 memorandum being dated January 8, 1979, from  
5 Mr. Creswell to Mr. Streeter entitled "Conveying  
6 New Information to Licensing Boards," and the specific  
7 note being Item 3 on Page 2 of that memorandum, which  
8 does refer to a transient of November 29, 1977 at  
9 Davis-Besse.

10 Now, I want to come to that transient  
11 with you, and it is my understanding, also, that this  
12 portion that you have referred to, Paragraph 3 on Page 2  
13 of the attached January 8, 1979 memorandum was, in fact,  
14 quoted in I&E Bulletin 7905, which was issued right  
15 after the TMI 2 accident, is that correct?

16 A That's correct.

17 Q I do, as I say, want to come to that transient  
18 with you, but I was attempting to focus first upon a  
19 transient which occurred on September 24, 1977 at  
20 Davis-Besse. So let us jump back for a moment and let  
21 me ask you if you know anything about that transient  
22 on September 24, 1977.

23 A I know less about that one than I do about this  
24 one that is here.

25 Q On September 24, 1977, Davis-Besse, PORV

1  
2 stuck open, the pressurizer level rose, and the  
3 operator turned off the high pressure injection based  
4 on that rise in the pressurizer level. Are you  
5 aware of that transient?

6 A Yes, I have read that report.

7 Q Which report is that?

8 A It would have been LER for that --

9 Q When did you see that LER for that particular  
10 transient?

11 A Subsequent to the Three Mile Island event.

12 Q After March 28, 1979?

13 A Yes.

14 - Q How did that area come to your attention?

15 A Well, in the reviews that were being made of the  
16 previous events that may have been similar or related  
17 to the Three Mile Island event.

18 Q You were called upon to do a review of LER's  
19 as to other possible similar events prior to Three  
20 Mile Island?

21 A Not personally, but people were gathering the  
22 things together, and I read these things. I also  
23 presumed this is included in the Tedesco report which  
24 I read.

25 Q It is described in the Tedesco report.

1  
2 However, the premature termination of the HPI is not  
3 described in the Tedesco report. What I want to come  
4 to is how you learned that that particular facet of  
5 that transient had occurred.

6 A I really don't know how I learned it.

7 Q Well, did you learn it from the LER?

8 A I simply don't know how I came to that knowledge.

9 Q Are you learning it from me for the first  
10 time or have you heard it previously?

11 A I believe I have heard it previously.

12 Q Okay. Where have you heard it?

13 A I simply don't know where I came into this --

14 - Q You mentioned the LER on this event. You  
15 read that LER?

16 A Well, I don't have any specific recollection of  
17 exactly which LER's that I have read, and when I actually  
18 read them by and large. Most of these LER's, with the  
19 exception of the one that was attached to the Creswell  
20 memo, most of these I read only after the Three Mile  
21 Island event.

22 Q Were you requested to do so?

23 A I wasn't. I was trying to learn more about  
24 what intelligence was available for us to go forward  
25 from here.

1  
2 Q What intelligence did you get concerning  
3 the Davis-Besse transient of 9/24/77?

4 A That it had some similarities to the Three Mile  
5 Island event.

6 Q Did you look at an LER on the September 24,  
7 1977 event?

8 A I presume that I have seen an LER on that, but  
9 I can't tell you with certainty that I have seen the  
10 LER for that event.

11 Q What response did the NRC make in connection  
12 with that LER on September 24, 1977 transient at Davis-  
13 Besse?

14 A I can't tell you from direct knowledge. I have  
15 to presume that Region III looked into it and came to  
16 some conclusions on it.

17 Q Let me see if I understand.

18 After March 28, 1979, you made an effort to  
19 determine what prior transients had occurred that might  
20 bear upon the Three Mile Island accident, is that right?

21 A Yes.

22 Q In doing that, you came across an LER on  
23 September 24, 1977 transient at Davis-Besse, is that  
24 right?

25 A I have read a number of LER's that were related

1  
2 to B&W plants, and I cannot confirm right now that I  
3 have read the September 24th LER; I believe that I have,  
4 but I can't say with certainty.

5 Q Let me show you a document that has previously  
6 been marked as Exhibit 3 to the Creswell deposition  
7 that has previously been taken by this Commission's  
8 investigation, and ask you whether you have ever seen  
9 that document before.

10 A I don't recall having seen this before.

11 Q If you had followed up on the history of  
12 the LER for the September 24, 1977 transient at Davis-  
13 Besse, would you have found that document? It is an  
14 Inspection & Enforcement report prepared by Mr. Creswell  
15 that relates to that transient?

16 A Well, I didn't mean to imply that I had done a  
17 thorough study of the LER's that had occurred and all  
18 of the follow-up actions that had been taken. I have  
19 not done that.

20 Q You have not traced the history of the  
21 treatment of the Davis-Besse transient of September 24,  
22 1977 through the NRC?

23 A No, I haven't.

24 Q Has anyone done that?

25 A I don't know whether anyone has done that or not.



1  
2 Q Would that be a source of concern to you  
3 in terms of the evaluation of that transient of  
4 September 24, 1977?

5 A Up to this point, my concern has not dwelled on  
6 why something wasn't done sooner, but rather dwelled  
7 on whether or not what we are doing now is the appro-  
8 priate thing.

9 At a later point in time, when I have the  
10 time to put into it, then I will be looking at what  
11 should we do differently in the future to unearth  
12 these kinds of things in a more timely fashion.

13 Q I think you have misinterpreted the whole  
14 thrust of my question.

15 If a prior transient occurred which  
16 involved essentially the same facets as occurred at  
17 TMI 2 on March 28, 1979, and if that transient had  
18 previously been evaluated by the NRC, wouldn't that  
19 evaluation be of some use to you in evaluating the  
20 situation at TMI 2?

21 A It may well be.

22 Q Wouldn't it give you some guidance as to  
23 how you might want to further analyze the accident at  
24 Three Mile Island 2?

25 A It may contain information that is useful, yes.

1  
2 Q But you hadn't made any such inquiry so far  
3 as to how the transient of September 24, 1977 was  
4 previously evaluated?

5 A I personally have not.

6 Q Do you know of anyone else in the NRC who  
7 would have done so?

8 A I don't know what other people have done. I  
9 don't know that --

10 Q Would that be a function of the Inspection &  
11 Enforcement Division to determine what evaluation had  
12 previously been done?

13 A The function of the determining what action should  
14 be taken in terms of equipment modifications and require-  
15 ment modifications is principally in NRR.

16 Q Does I&E interface with NRR in terms of  
17 evaluation of transients that involves things such as  
18 pressurizer aberrations and --

19 A Yes, we interface with them.

20 Q And again, to your knowledge, no one in NRR  
21 is doing this either, tracing the history and determining  
22 what evaluation has been made of this transient?

23 A You see, they may be doing it and I wouldn't know.  
24 I don't want to imply to anyone that no one is doing it.  
25 I can only say that I don't have any knowledge of what

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they are doing specifically in terms of what pieces  
of paper they are looking at and reviewing.

(Continued on next page.)

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2 Q Let me come back to the document that we  
3 have marked as Exhibit 3 to this deposition, which you  
4 do recall seeing towards the end of January. What did  
5 you do with this particular document once you received  
6 it?

7 A I turned it over to my staff and I asked them to  
8 review it.

9 Q Who on your staff?

10 A Ed Jordan.

11 Q What did Mr. Jordan do?

12 A Mr. Jordan did review this. He discussed it  
13 with people in licensing. He had discussions with the  
14 people from the regional office, including Mr. Creswell.

15 Q When did he have his discussions with  
16 Mr. Creswell?

17 A They were undoubtedly during the month of February.

18 Q Did you say Mr. Jordan also spoke with other  
19 people on your staff?

20 A Well, he would have spoken with other people on  
21 the staff and people in NRR, as well as talking with  
22 Mr. Creswell and Mr. Streeter and others.

23 Q Who did he speak to in NRR?

24 A You will have to ask him. I don't specifically  
25 know.

- 1
- 2 Q You do not know who he spoke to?
- 3 A No.
- 4 Q But you know he spoke to Mr. Creswell and
- 5 Mr. Streeter?
- 6 A Well, I know Mr. Creswell. I presume
- 7 Mr. Streeter would have been involved in it. He
- 8 specifically told me that he had talked with Creswell.
- 9 Q What determination did Mr. Jordan make
- 10 based on his conversations with Mr. Creswell and
- 11 Mr. Streeter?
- 12 A Mr. Jordan made the determination that the
- 13 information presented by Mr. Creswell did not present
- 14 new information or put a different light on information
- 15 that was available. Therefore, it was not necessary
- 16 or appropriate to go with this information to the
- 17 hearing board. His determination was specifically not
- 18 made that these matters were insignificant or should
- 19 not be given further review.
- 20 Q But it should not be sent to the hearing
- 21 board?
- 22 A That's right.
- 23 Q It did not present new information?
- 24 A That's right.
- 25 Q Let me see if I understand what you just



2 said. He did not make a determination that the infor-  
3 mation did not deserve further study?

4 A That's right.

5 Q Can you explain that? That sounds a little  
6 incongruous to me. If it is not new and not necessary  
7 to send it to the hearing board, how can it not be  
8 unworthy of further study?

9 A The forwarding of information to hearing boards  
10 is not the way to resolve problems in the NRC. You  
11 resolve problems through the normal course of doing  
12 business. You identify things to hearing boards which  
13 you believe are of sufficient importance that they  
14 should specifically focus on those issues, as opposed  
15 to the staff, ours and NRR and others, solving the  
16 problems and presenting them, as part of their total  
17 evaluation, what should be done about it.

18 Q Did you concur in this determination?

19 A Yes, I did.

20 Q Did you understand that at the time you did  
21 so, that operators out in the field were relying on  
22 pressurizer level to assess state of inventory in the  
23 core?

24 A I knew that was the general premise that was used,  
25 yes.

1  
2 Q Did you understand that Mr. Creswell was  
3 concerned about aberrations in pressurizer level?

4 A Yes, but my understanding of Mr. Creswell's  
5 concern was that he was concerned with the pressurizer  
6 voiding and thus leading to steam voids in the primary  
7 coolant system itself, and he was concerned that once  
8 the pressurizer level indication was lost, there was  
9 no direct indication of how large the void may have been.

10 Q Did you understand also that once the  
11 pressurizer level was lost, the operator was deprived  
12 of the primary parameter upon which he relied to assess  
13 the state of inventory in the core?

14 A - But not the only one.

15 Q But the primary one?

16 A The one that was used most, but I have to say  
17 that it's incorrect to use that to the exclusion of  
18 all others.

19 Q Yes, I understand that. But on the other  
20 hand, you did have it in mind that the operators were  
21 using that as a primary parameter?

22 A As one of the parameters.

23 Q It did not occur to you that in light of  
24 what Mr. Creswell was concerned with, it might be  
25 appropriate to issue some type of advisory to the

1  
2 operators that under these types of circumstances,  
3 they could not rely upon pressurizer level to indicate  
4 state of inventory in the core, that it was simply a  
5 misleading reading?

6 A I did not reach that conclusion that this should  
7 be done.

8 Q Mr. Jordan did not, either?

9 A That's correct.

10 Q If someone like Mr. Creswell out there in  
11 Region III identifies a generic safety concern with  
12 B&W plants, what is the procedure he should follow?

13 A He should discuss it with his supervisor and he  
14 should prepare a memorandum which goes through his  
15 supervisor to this office, pointing out the problem and  
16 requesting that it be reviewed and pursued with licensing  
17 or whatever he thinks is the right course.

18 Q He should talk to his supervisor? He  
19 should prepare an I&E report?

20 A No, this would be a memorandum.

21 Q Who should that be directed to?

22 A It should ultimately come to this office, to me  
23 or to Jordan, probably to Jordan, either to me or Jordan.

24 Q Who should Mr. Creswell direct the memorandum  
25 to?

1  
2 A It varies. In some cases, he might route it  
3 through Mr. Streeter to Mr. Keppler or through  
4 Mr. Streeter and Mr. Keppler to me or Jordan, or there  
5 may be a series. It has the same end result.

6 Q That is the proper procedure?

7 A There is no defined procedure that says it must  
8 be sent to Mr. X. The procedure says that if you  
9 have -- and it's more informal than formal -- if you  
10 have a concern, write it down and forward it into head-  
11 quarters for review.

12 Q There is no rigid established procedure for  
13 raising generic safety concerns? It is an informal  
14 procedure?

15 A It's informal in that it is not rigid. There is  
16 not a form that is utilized. It's well known by all  
17 the inspectors. They are admonished, encouraged, and  
18 requested to bring these things to people's attention  
19 in this fashion.

20 Q So Mr. Creswell would prepare a memorandum to  
21 either Mr. Streeter, his immediate supervisor, or to  
22 the head of his region, Mr. Keppler, or anybody else  
23 that he could send it to?

24 A It would either be addressed to them for further  
25 forwarding or it would be addressed through them to

1 this office.

2 Q Who in this office?

3 A Either Mr. Jordan or myself.

4 Q What would be the next step, then?

5 A The next step would be that Mr. Jordan and his  
6 staff would review this event or this suggestion and  
7 probably discuss it with the suggester and decide what,  
8 if any, action should be taken, and if they decide  
9 that action should be taken, they would pursue it  
10 with the licensees.

11 Q How long does that process usually take?

12 A It varies.

13 Q Based on what?

14 A Based on the workload of the people involved and  
15 the feeling of urgency that is felt by those people who  
16 are acting on it.

17 Q If a particular report discloses that an  
18 operator has prematurely terminated HPI based upon  
19 erroneous water level in the pressurizer, does that  
20 raise a significant safety concern?

21 A It would depend on the circumstances and the  
22 result of and the perceived generic applicability of  
23 this action.

24 Q Do you have any idea what generic applicability



1  
2 was perceived in connection with Mr. Creswell's concern  
3 on that point?

4 A The memorandum that you have indicated does not  
5 describe such concerns.

6 Q I am not sure I know what you mean. Do  
7 you mean Creswell Exhibit 3?

8 A Yes.

9 Q What Creswell Exhibit 3 is, as I understand it,  
10 is a letter directed to the licensee from Gaston  
11 Fiorelli, who is the chief of the reactor operations  
12 and nuclear support branch in Region III, in which he  
13 encloses the inspection enforcement report which was  
14 prepared by Mr. Creswell and approved by Mr. Streeter.

15 A This is what I really was referring to. There is  
16 nothing that I read in this that exhibits this concern.

17 Q That's right. This simply talks about  
18 aberrations in the pressurizer level, based upon the  
19 November 29th transient.

20 A That's right.

21 Q That is Exhibit 3 to this deposition, which  
22 is the memorandum of January 19, 1979, to you from  
23 Mr. Keppler.

24 Let me show you another document which has  
25 been marked as Exhibit 6 to the Creswell deposition.

1  
2 This, again, as I understand it, is a copy of an I&E  
3 report prepared by Mr. Creswell in January of 1979, and  
4 it is attached to a cover letter to the licensee, Toledo  
5 Edison, dated February 7, 1979, again from Gaston  
6 Fiorelli, the chief of reactor operations in nuclear  
7 support branch in Region III. I want to specifically  
8 direct your attention to Paragraph 2 on Page 2 of the  
9 I&E report, which reads, "Unresolved item -- during the  
10 exit interview on November 2, 1978, the inspector again  
11 requested to review the licensee's evaluation concerning  
12 high pressure injection delay which would demonstrate  
13 the HPI flow experienced during the September 24, 1977  
14 event was conservative when compared to accident analysis  
15 assumption. The inspector was informed that the analysis  
16 was not available for review. During the entrance  
17 interview on December 20, 1978, the inspector again  
18 requested the analysis and again it was not available  
19 for review. During the exit interview on December 22,  
20 1978, the inspector informed the licensee that, prior  
21 to returning to power operation, the licensee should  
22 assure that the flow delay did not indicate the HPI  
23 system was inoperable."

24                   Would problems with the HPI system and  
25 questions about the flow rate be considered a significant

1 safety problem at a B&W plant?

2 A I have not read this report, but from what you  
3 read, I would say that this was an area of some  
4 concern to the inspector. However, from characteriza-  
5 tion as an unresolved item, it implies that it is not  
6 perceived by the inspector at this point in time to  
7 be a significant safety issue that demands resolution  
8 promptly. Otherwise it would have been categorized  
9 as a safety issue.  
10

11 Q It is simply at that point noted as an open  
12 item?

13 A That's right. By the handling of it, labeling  
14 it this way, that attaches some level of significance  
15 as perceived by the inspector.

16 Q Let me show you another document that has  
17 been previously marked as Exhibit 7 to the Creswell  
18 deposition. This is a copy of an inspection enforcement  
19 report. The inspection trip took place in February of  
20 '79. The report itself is dated in March of 1979.  
21 Again, it is attached to a cover letter to the licensee  
22 from Region III, the cover letter being dated March 28,  
23 1979. Specifically directing your attention to Page 4  
24 of that report, it says: "Unresolved item: High  
25 pressure injection performance. The inspectors met

1 with power engineering personnel on February 7, 1979,  
2 to discuss inspector comments related to the high  
3 pressure injection review performed by power engineering.  
4 The inspector noted that a flow versus pressure compari-  
5 son of the September 1977 event and the small break  
6 analysis had not been made. The licensee stated that  
7 pre-operational test results and consideration of  
8 instrument errors verified HPI system operability.  
9 The licensee also stated that NRR had reviewed the  
10 September 24, 1977 event and by its review had approved  
11 the HPI operability issue." It goes on to describe a  
12 number of items of information requested by the  
13 inspectors in connection with this issue.

14 This report indicates, I take it, that  
15 again, the question of the HPI operation during the  
16 September '77 transient was still an open item. This  
17 is as of February of 1979. It concerns a transient  
18 which occurred in September of 1977. Is it customary  
19 for such open items relating to HPI performance to  
20 remain open like that for over a year after the event  
21 occurred?  
22

23 A It should not go on that long. Again, it depends  
24 on what the inspector's perceived level of concern is.  
25 If his level of concern was that continued operation

1  
2 of this plant is unsafe with this type of thing unresolved,  
3 then he should have made a larger issue of it than simply  
4 issuing, listing it as an unresolved item in his report.

5 Q Did Mr. Creswell make a larger issue of this?

6 A Not to me.

7 Q Did he make it to anyone else?

8 A I understand that he talked with Mr. Keppler on  
9 one occasion.

10 Q When was that?

11 A I don't recall exactly. It would have been  
12 sometime prior to March 28.

13 Q During 1978?

14 A - I don't have that specific. I don't know.

15 Q During 1977?

16 A I don't really know.

17 Q How did you learn of this?

18 A Mr. Keppler told me of this. I did not ask him  
19 at what time this had occurred.

20 Q What did Mr. Keppler tell you?

21 A He said that Mr. Creswell had come to him and  
22 stated that he believed that the Davis-Besse plant  
23 should be shut down, should not be allowed to operate  
24 for some reasons that Mr. Keppler told me were more  
25 related to the management deficiencies that were



1 exhibited at the plant and his concern for the fact  
2 that problems were not resolved as rapidly as  
3 Mr. Creswell thought they should have been.

4 Q What were those management deficiencies?

5 A I didn't get that specifically from Mr. Keppler.  
6 I know that Mr. Keppler has had meetings with the  
7 Davis-Besse management to express concern that they  
8 were not deeply involved enough with the ongoing  
9 operations and did not pursue resolution of problems  
10 as rapidly as he felt they should, and that he wanted  
11 to call their attention to the need for their involve-  
12 ment and this attention to detail.

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(Continued on next page.)

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2 Q What was the result of that conversation  
3 that Mr. Keppler had with the management of Davis-  
4 Besse?

5 A Well, he got assurances from them that they  
6 would do things differently.

7 Q What things?

8 A I wasn't at the meeting. I can't report on  
9 the specifics of it.

10 Q When did you talk to Mr. Keppler about  
11 this?

12 A It would have been probably in April or  
13 something of that nature.

14 Q April of 1979?

15 A I suspect it was in that time frame. I don't  
16 recall exactly.

17 Q How did it come about that you were  
18 talking with Mr. Keppler at that time?

19 A Well, there were concerns about -- this was  
20 in the time period before the B&W order was issued,  
21 or the orders were issued to all B&W plants that  
22 they should stay down until the order was lifted.  
23 So we were discussing what, if anything, should be  
24 done about Davis-Besse. Davis-Besse was not at  
25 that time operating. They were down, I believe, for

2 refueling and had not started back up, and they had  
3 agreed with Mr. Keppler that they would not start  
4 back up until the further review of the Three Mile  
5 Island event, so the discussions were related to  
6 whether or not there was something additionally needed  
7 for Davis-Besse to do before they were allowed to  
8 begin operation.

9 Q In the course of that conversation, then,  
10 you began to talk to Mr. Keppler about prior conver-  
11 sations he had with the Davis-Besse management?

12 A Well, yes.

13 Q He also told you that Mr. Creswell was  
14 concerned about problems not being resolved as rapidly  
15 as possible or as rapidly as Mr. Creswell would have  
16 liked?

17 A Yes.

18 Q What problems were those?

19 A I can't give you the specifics. They related to  
20 equipment and operational things that were not re-  
21 solved as rapidly as Mr. Creswell wanted, and Mr.  
22 Keppler told me he had shared some of Mr. Creswell's  
23 concern. However, he did not feel that they were  
24 sufficient to order the plant shut down.

25 Q He did agree with Mr. Creswell's concerns?

1

2 A He shared some of Mr. Creswell's concerns.

3

Q Did he tell you what he had done about  
4 Mr. Creswell's concerns?

5

A He told me that he had had this previous  
6 meeting and told me that he had indeed planned a  
7 meeting which would have taken place, I believe, the  
8 very same week that the Three Mile Island event  
9 occurred, but it was postponed because of the Three  
10 Mile Island event, and that he planned to have that  
11 meeting as soon as he could reschedule it.

12

Q He had scheduled it the same week as the  
13 Three Mile Island event?

14

A I believe, or the following week. It had been  
15 already scheduled, but was postponed.

16

Q That was a meeting with Mr. Creswell?

17

A No, with the management of Davis-Besse.

18

Q Did Mr. Streeter tell you whether or not  
19 there would be a prior evaluation of Mr. Creswell's  
20 concerns concerning Davis-Besse?

21

A I didn't talk to Mr. Streeter.

22

Q I'm sorry; Mr. Keppler.

23

A We did not talk of that.

24

Q Do you know, independently of any  
25 conversation with Mr. Keppler, what evaluation, if

1  
2 any, by NRC was made of Mr. Creswell's concerns  
3 about Davis-Besse?

4 A I don't know.

5 Q Do you know if anyone in NRR was con-  
6 tacted concerning Mr. Creswell's concerns about  
7 Davis-Besse?

8 A I'm not aware of either whether Mr. Creswell  
9 had concerns prior to these that were expressed, or  
10 if there were any, what action was taken on them.

11 Q Again, coming back to it, you do recall  
12 having looked at one point at an LER that related  
13 to the September 24, '77 transient?

14 A - After the TMI event.

15 Q Did you determine at that time that that  
16 transient involved any items of significance relative  
17 to the TMI event?

18 A Yes, there were items of significance that  
19 related to the TMI event.

20 Q What were those items?

21 A As you have reminded me, the turning off of  
22 the high pressure injection system, the voiding,  
23 apparent voiding in the core, and things of this  
24 nature.

25 Q Did you make any determination at that



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time as to how or why these events had occurred at Davis-Besse?

A No, I didn't.

Q Did you make any attempt to determine whether or not anyone else in the NRC had determined how or why these events had occurred?

A No, and you understand that at this point, we had already issued bulletins which would require the HPI to be, to remain inoperative until certain things were satisfied, so any event preceeding that where people had terminated HPI would no longer be of independent concern.

Q Are you aware of any corrective action that was taken at Davis-Besse in response to the transient that they had on September 24, 1977?

A I'm not aware.

Q If any action?

A I'm not aware what corrective action was taken at all.

Q So it could have been none?

A It could have been none, it could have been something. I don't know.

Q How often do you have occasion to refer to LER's, to examine them?

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A The written report?

Q Yes, Licensee Event Report.

A Not very often.

Q Does anyone in your division have occasion to look regularly at LER's?

A Yes, I have two people in my group who have as one of their job responsibilities review of LER's. One person reviews these for PWR's and another for BWR's.

Q Do they review all Licensee Event Reports that are submitted on PWR's and BWR's?

A That is their hope, to be able to review them all. They have other job responsibilities, and some of them get reviewed.

Q How many LER's are submitted to these people in one week, for example?

A It varies. It may be as many as twenty or thirty a week.

Q Is that per person?

A It could be as high as that. I don't know what the average is. Probably less than that.

Q How about per month?

A I don't know what the average rate is over a long period of time.

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2 Q Have you ever made any attempt to  
3 determine whether or not these people are getting  
4 too many LER's?

5 A I know they are getting too many and they  
6 are unable to do it. At the present time I am trying  
7 to get additional people to do just that. Positions  
8 have been advertised and we are in the process of  
9 filling those positions.

10 Q How long have you had two staff people  
11 reviewing LER's?

12 A At least as long as I have been in my present  
13 job.

14 Q That has been since 1978?

15 A Yes.

16 Q During the time you were director of the  
17 Division of Reactor Construction Inspection, did  
18 you have occasion to look at Licensee Event Reports?

19 A Very little, about the same or even less than  
20 I personally do now.

21 Q Have you ever seen a Licensee Event  
22 Report that did not contain the phrase "The health  
23 and safety of the public was not affected"?

24 A I don't know. Certainly, if I have seen one,  
25 it has been a rare event. I can't say that I have

1  
2 never seen one, but I will agree with you that  
3 statement is in most of them.

4 Q It is pretty much kind of a rote thing  
5 that the licensee puts in there?

6 A Yes.

7 Q The licensees prepare the LER reports,  
8 do they not?

9 A Yes.

10 Q How much weight is given to determination  
11 by the licensee that the event described in the LER  
12 does not affect the health and safety of the public?

13 A That statement is ignored for our review.

14 Q It is ignored?

15 A Yes.

16 Q What does I&E do in order to test the  
17 statement in the LER's whether or not the health  
18 and safety of the public was affected?

19 A We attempt to make an independent review.  
20 By "independent," I mean at least an independent  
21 judgment. We don't in all cases go out and try to  
22 get independent data, but we try to make an  
23 independent judgment based on the facts. If we  
24 find those facts are insufficient, then we go and  
25 try to get some additional facts.

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Q How do you determine whether the facts are insufficient or not?

A It's based on the review, whether there is enough information to complete the review and to answer the principal questions that come to mind as a result of reviewing this.

Q Suppose portions of the event are left out by the licensee, not mentioned at all?

A This we expect to be picked up by the regional office in their review of the LER on a plant specific basis.

Q How can the regional office do that if the licensee left it out?

A The region doesn't just read the report. On some percentage of them, they go and review the events, look at records, charts and logs. They do not do it for every one, but on a percentage of them they do, for most of the 14-day reports.

Q Most of the 14-day reports? What about the regular 30-day reports?

A They take a sample, and the sample is designed to determine that the licensee is including all the appropriate facts, as well as to determine the depth of their analysis.



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Q What sampling do they do? What percentage of 30-day reports?

A A small sample, 20 percent or so.

Q Do you know if any check was done at Davis-Besse in connection with the September 24, 1977, transient to determine whether or not licensees had properly reported the termination of HPI by the operator?

A I don't know specifically. We have to conclude that Region III, Mr. Creswell's, specially does pursue that from the things you have shown me.

Q Do you know when Mr. Creswell first began to pursue that?

A I don't know.

Q Mr. Creswell has previously testified that he came across the matter for the first time in the middle of 1978. Would it be customary for there to be an approximate 9-month lapse between that type of event taking place and someone actually beginning to look into it from the region?

A Well, as I said, we don't review all of these events, so it's possible that this event wasn't reviewed earlier. I can't say why.

Q A certain portion of the 30-day LER's

2 are checked as to the records which the licensee  
3 actually maintains?

4 A Yes.

5 Q How would the inspector know what to  
6 look for if certain portions of the events were  
7 simply not mentioned in the LER?

8 A From his knowledge and experience. He would  
9 look at recorder charts and log books and this kind  
10 of thing, and he would say, he would ask himself and  
11 then ask the licensee, "What about this parameter?  
12 What was it doing during that time period?" And he  
13 would look at that.

14 - If the licensees were deliberately leaving it  
15 out, that's the way he would come upon it.

16 Q So simply, the bottom line would be the  
17 knowledge and experience of the inspector?

18 A That's right.

19 Q To your knowledge, has that kind of thing been  
20 caught in the past with licensees?

21 A There have been occasions where, let's say,  
22 things were presented in a different light than they  
23 would have been had the inspector written the report.  
24 I'm not aware of any situation where we have  
25 determined that licensees have knowingly omitted

1  
2 significant information with the intent to deceive  
3 us.

4 Q You are not aware of any such situation  
5 where there has been an intentional deception?

6 A No.

7 Q I want to jump back to this document  
8 that we have been talking about that has been  
9 marked as Exhibit 3 to this deposition. You said  
10 that Mr. Jordan, during February, did an analysis  
11 and determined there was no new information and that  
12 there was no necessity to transmit it to a hearing  
13 board, that you concurred in that determination.  
14 What did you do then?

15 A Well, I believe there were memoranda written  
16 to the hearing board people. Let me back up. First  
17 there was a discussion between Mr. Jordan and, I  
18 believe, it involved Mr. Brian and some other  
19 people in Region III, during which this was discussed,  
20 and the discussion went that we in headquarters did  
21 not believe that this information was required to  
22 be reported to the board and asked if Mr. Creswell  
23 still felt strongly that it should be, and at the  
24 end of this conversation the decision was made by  
25 Mr. Jordan to recommend to me that since Mr. Creswell

1

2 still felt that it should be reported to the board,  
3 that the board should be notified, but it should  
4 be stated that we did not agree that it was required.

5

6 Subsequently, there was another memoranda, of  
7 March 27, to Mr. Tedesco from Mr. Jordan, in which he  
8 goes on to say that we planned to follow up on the  
9 pressurizer level problem with a further request  
10 to NRR. One of the items in Mr. Creswell's list  
11 of concerns had to do with an electrical problem,  
12 and our subsequent pursuit of that issue resulted  
13 in the issuance of a bulletin on that particular  
14 problem, so there was not a signoff of Mr. Creswell's  
15 concerns at this time but rather that the notification  
16 of the board was not necessary.

16

Q What was the electrical problem?

17

A I will have to go to the list and see. I  
18 don't recall the specifics. It's Item 4 in Mr.  
19 Creswell's memorandum.

20

Q Item 4 on page 2 of this January 8  
21 memorandum, which is part of the exhibit we have  
22 marked as Exhibit 3, does refer to a memorandum from  
23 B&W regarding the control rod drive system trip  
24 breaker maintenance. That was an electrical problem  
25 that was subsequently followed up?



1

2 A Yes.

3 Q What about the pressurizer level question?  
4 Was that ever followed up?

5 A There is this memorandum that I just referred to.

6 Q This is a memorandum to Robert Tedesco,  
7 entitled "Evaluation of Items for Licensing Board."  
8 It refers to six items relating to B&W plants which  
9 were submitted to Mr. Vassallo on March 1, 1979, for  
10 transmittal to appropriate licensing boards. Pre-  
11 liminary evaluation by I&E at that time indicated  
12 that notification was not required.

13 If I understand it, the determination that  
14 notification was not required was based upon your  
15 determination and Mr. Jordan's determination that  
16 this was not new information.

17 A It was not new information, nor did it shed  
18 new light on a problem, an older problem. Those  
19 are the two criteria for notification of the board.

tp7

20 Q At that time, did you regard operator reliance as  
21 a primary parameter for state of inventory in the  
22 core on pressurizer level indication to not be a  
23 new problem?

24 A Well, as you recall, going back to Mr.  
25 Creswell's memorandum, his concern expressed in here



1  
2 was the size of the pressurizer and the level of  
3 instrumentation.

4 Q And the aberrations of pressurizer level  
5 during certain transients, correct?

6 A If you read his specific concern, it's not  
7 that broad.

8 Q I am looking at page 2 of the January 8  
9 memorandum from Mr. Creswell to Mr. Streeter, which  
10 is part of the document we have marked as Exhibit 4  
11 in his deposition. The first sentence of Paragraph 3  
12 on page 2 is "Inspection and Enforcement Report" -- it  
13 gives the number -- "documented that pressurizer  
14 level had gone offscale for approximately five  
15 minutes during the November 29, 1977. loss of off  
16 site power event. There are some indications that  
17 other B&W plants may have problems maintaining  
18 pressurizer level indications during transients."

19 If I understand that, he is talking  
20 here about the loss of pressurizer level indication,  
21 correct?

22 A Yes.

23 Q At the time this was evaluated by your  
24 office, by you and by Mr. Jordan, you were aware,  
25 I think you have stated, that operators were relying

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upon pressurizer level indications to assess the state of inventory in the core as a primary parameter.

A As one parameter.

Q As one primary parameter. When you read this and evaluated this, did that not indicate to you that there was the possibility of operator error utilizing that parameter to assess the state of inventory in the core?

A If operators relied solely on the pressurizer level, then they would have been without any indication of inventory in the core. If, however, they used the pressurizer level together with pressure temperature indications a direct correlation of level is obtainable. That is not to say that I think that having no indication of level in the pressure is a good thing to have.

Q You feel it is a bad thing to have?

A Yes.

Q Did you feel it was bad at the time that you read this document?

A I was not happy with it, that's correct. That's the reason for our intention to follow up on this concern.

2 Q But not in the subject of licensing  
3 boards?

4 A Not in terms of referring it to the licensing  
5 boards.

6 Q Not in the context of notifying the  
7 licensees they should not rely upon pressure level  
8 indications?

9 A I did not reach that conclusion at that time.

10 Q Were you aware of the fact that in the  
11 meantime, the situation was continuing?

12 A Well, I guess you have to presume if you don't  
13 tell somebody to do something different then what has  
14 been done, it will continue.

15 Q Were you aware of the fact that Mr.  
16 Creswell's concerns were as to a transient which  
17 occurred in 1977 in Davis-Besse, in November,  
18 approximately 12, 13, 14 months before you were read-  
19 ing this document?

20 A I don't recall being impressed by the date  
21 of the event.

22 Q Do you recall being impressed by the  
23 time this was taking for this problem to be  
24 evaluated?

25 A Since I was not impressed by the date, the

1

2 time span was not particularly highlighted for me.

3

Q Would it be customary within I&E to take  
4 over 13 months for an evaluation to be made of this  
5 kind of problem?

6

A To a large extent, the timing depends on the  
7 manpower available to work on these things and the  
8 perceived importance of that particular issue at the  
9 time.

10

Q Again, it was pretty much a matter of  
11 priorities of work load that you had at that time?

12

A That had a large influence.

13

Q The other large influence would be that  
14 you did not particularly perceive this to be that  
15 significant a problem at the time?

16

A It was not perceived as being the most important  
17 problem that had to be worked on at that time.

18

[Continued on next page.]

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T-8

Moseley

1  
2 Q When you say it was not perceived, you  
3 mean by your office?

4 A Yes.

5 Q Let's have this other document you pro-  
6 vided to me marked as Exhibit 4. It is an evaluation of  
7 items for licensing boards, the document you have been  
8 referring to as the notification that this matter  
9 would be sent onto a licensing board.

10 A There are other documents that do that. Maybe  
11 they are included as attachments. Let me look at it.  
12 This document is not the one that specifically said  
13 to send it over to the board. The document which  
14 specifically said to send it onto the board is this one.

15 Q This is a document dated February 28, 1979.  
16 It is a memorandum for Dudley Thompson, executive officer  
17 for operations support; i.e. from you, Mr. Moseley.  
18 The subject of notification of licensing boards, and  
19 it has a number of attachments, including the  
20 January 8, 1979 memorandum from Mr. Creswell to Mr.  
21 Streeter that we have been referring to. There is  
22 a previous cover letter to Mr. Reid of NRR, dated  
23 December 22, 1978, from Toledo Edison, as well as a  
24 letter dated June 12, 1978, from Mr. Faz of Babcock  
25 & Wilcox to Mr. Murray of Davis-Besse.



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There is also a letter dated August 9, 1978, from Mr. Green of Babcock & Wilcox to Mr. Murray, again, of Davis-Besse, with a number of attachments that appear to relate to a transient which occurred on March 20, 1978.

Let's have this document marked as Exhibit 4 to this deposition, and then I would like to ask a few questions about it.

(The above described document was marked Moseley Exhibit 4 for identification, this date.)

Q This document we have had marked as Exhibit 4. The cover memorandum on top is dated February 28, 1979. It states that the preliminary evaluation made by your office indicates that the items do not appear to be new issues or to put a different light on the issues and, therefore, in your opinion, it does not meet the intended criteria for board notification. It also says the originator -- I take it that is Mr. Creswell -- was informed of that determination on February 27, 1979, and he expressed his position that the evaluation provided by your office did not provide any information he did not already have, that his concern was whether or not these items had been considered and resolved on a

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Moseley

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generic basis for all B&W plants. At that time,

3

February 28, 1979, did you also have a concern as

4

to whether or not these items had been resolved on

5

a generic basis for B&W plants?

6

A I was concerned that we needed to look into this

7

more deeply than we had to determine if there was a

8

generic issue to resolve and if there was, to get it

9

resolved.

10

Q What else did you need to know at that point

11

to determine whether or not there was a generic safety

12

issue involved here?

13

A Well, our review had been principally restricted

14

to the piece of paper that Mr. Creswell referred to in

15

his request. We had not at that time had an opportunity

16

to go back and do the review of other transients that

17

other people had had and to put it all together.

18

Q Given the priorities of work loads that you

19

had at the time, how much of an opportunity would you

20

have needed to have gone back and explored the other

21

transients at Davis-Besse that might have related to

22

this matter? What physically is involved?

23

A Time.

24

Q How would you go about it?

25

A We would go through and identify the transients

2 and then pull out the paperwork associated with them,  
3 the LER itself, perhaps the inspection report, and  
4 assemble the documents and review them and put them  
5 together, get all the information, enmesh it, and  
6 see whether or not, what the extent of the problem  
7 area is.

8 Q Couldn't you just call Mr. Keppler at  
9 Region 3 and tell him you wanted what documentation  
10 he had on any transients at Davis-Besse that related  
11 to the kinds of concerns Mr. Creswell was raising?

12 A I could have, yes.

13 Q Couldn't you have talked to Mr. Creswell  
14 about what documentation he had that related to these  
15 transients?

16 A Obviously, I could have.

17 Q Did you or anyone in your office in fact  
18 ask Mr. Creswell what documentation he had relating  
19 to those transients?

20 A The discussion was, rather than identification of  
21 documentation, identification of what is the source of  
22 the concern.

23 Q He was identifying the source of concern  
24 as being a generic safety issue in connection with  
25 B&W plants and pressurizer level, is that correct?

2 A That's correct.

3 Q You did not ask him what documentation  
4 he had that related to that?

5 A No, the documentation is a second step. The  
6 first step is to communicate with the individual and  
7 say, "Hey, what is bothering you and why?" This was  
8 done. As a result of that, the conclusion was reached  
9 that this was not an issue which deserved and fit our  
10 criteria for board notification.

11 Q Do you think, based on what you know today,  
12 that that is true as of today?

13 A Based on what I know today, it's different.

14 Q How is it different?

15 A It obviously is a more significant problem than  
16 we perceived it to be in February of this year.

17 Q In February of this year, were you aware  
18 that the operator had prematurely terminated HPI at  
19 Davis-Besse on September 24, 1977?

20 A I am not sure that I had that information at  
21 that time. As I told you earlier, I don't recall when  
22 I came into that knowledge.

23 Q If you had had that information, would you  
24 probably have considered that this was not a generic  
25 safety issue for B&W plants?



2 A It's possible.

3 Q Could you explain to me how that is pos-  
4 sible?

5 A If the fault lies in the operator defeating  
6 a safety system from operating, that doesn't make it  
7 a generic issue.

8 Q If in looking into that matter, you  
9 determined that operators generally were relying, as  
10 you have indicated you were aware, upon pressurizer  
11 level to assess the state of inventory in the core,  
12 and you were further aware that these types of aberra-  
13 tions relating to pressurizer level occurred under  
14 certain types of small break LOCAS wouldn't that pose  
15 a generic safety issue?

16 A I think it's clearer to all of us now in retro-  
17 spect than it was at the time these events were taking  
18 place in isolation. It is not clear to me now or  
19 ever that operators relied solely on pressurizer level  
20 as their indication of what was going on in the core.  
21 This was never right.

22 Q Is it clear to you that based on what you  
23 know of the September 24, 1977 transient at Davis-  
24 Besse, that the operator was relying on pressurizer  
25 water level to determine state of inventory in the core?



1  
2 A It is my recollection from this that he may have  
3 for a period of a few minutes, and either he or someone  
4 else recognized that that was the wrong thing to do,  
5 and something else was done. Our recollection was  
6 that there was a short period of time when this oper-  
7 ator did indeed rely solely on that.

8 Q It was approximately 20 minutes?

9 A Yes.

10 Q Are you aware that the B&W training for  
11 operators in the pressurizer water reactors has stressed  
12 very heavily the use of water level in the pressurizer  
13 to assess the state of inventory in the core?

14 A - Yes.

15 Q Were you aware of that before March 28,  
16 1979?

17 A I am more aware of it now than I was at that time.

18 Q But you were aware of it then?

19 A I was aware that it was certainly, has always  
20 been in pressurizer water reactors that the level in  
21 the pressurizer is a very important indicator and that  
22 operators do look at it very, very closely. I also  
23 am aware that operators have been given considerable  
24 caution about taking a system solid, which is over-  
25 filling the pressurizer.

1  
2 Q Why is that such a concern? Why is there  
3 so much emphasis on pressurizer water level and not  
4 going solid?

5 A Water is not compressible, and once the system  
6 is totally full of water, then any pressure -- there  
7 is no cushion for pressure transients and starting  
8 the pump or temperature rises can cause wide fluctu-  
9 ations in pressure, which is solid, and the concern  
10 then is of rupturing something in the system from  
11 pressure spikes.

12 Q The way to prevent going solid or to come  
13 back from a condition of going solid once the ECCS  
14 has been actuated would be to interrupt the HPI, is  
15 that right?

16 A That is a way of doing it, yes.

17 Q Once the HPI is on, that would be the only  
18 way you could do it, isn't that right? You would have  
19 to do something about the HPI?

20 A You would have to throttle it to shut it off.

21 Q The HPI is a primary safety system, isn't  
22 it?

23 A Yes, but the same pumps are used for the makeup  
24 pumps.

25 Q I understand that. That is something else

1  
2 I wanted to ask you about, because I am aware already  
3 that the distinction is made consistently between  
4 safety related equipment and non. Makeup pumps per  
5 se are not safety related, are they?

6 A No, but if a piece of equipment has a dual  
7 function, if one of those is safety related, then  
8 it's treated as safety related.

9 Q It's all safety related, even though it  
10 can have a non safety related function as well?

11 A Yes.

12 Q In any event, coming back to the point,  
13 this concern over going solid, this pressurizer water  
14 level concern, necessarily involves terminating or  
15 throttling the HPI once the ECCS has been actuated in  
16 order to come back from going solid, and I take it  
17 your responses indicated that that was generally  
18 recognized and known within the NRC. That was the  
19 procedure that would be followed. Given that situ-  
20 ation and given the situation that occurred at Davis-  
21 Besse, why wasn't it recognized that once the  
22 plant went solid, the operator was going to have to  
23 interrupt a primary safety function, that is, the  
24 operation of the HPI?

25 A I can't say why it was not recognized. Again, in

1  
2 retrospect, it should have been, but it wasn't.

3 Q Let's have marked as Exhibit 5 this other  
4 document that you have provided, dated March 27, 1979.  
5 This is a note to Robert Tedesco related to evaluation  
6 of items for licensing boards, and it's a copy, I  
7 guess, of a document that was at some time signed by  
8 N. Jordan. I'm curious about something. The memorandum  
9 that we marked as Exhibit 4 is dated February 28, 1979.  
10 This is the formal transmittal for purposes of notifi-  
11 cation of licensing boards, is that right?

12 A There is yet another piece of paper which transmits  
13 it from -- it's just a little short forwarding memo-  
14 randum -- transmits it from Dudley Thompson to someone  
15 in Licensing, and there is another one that transfers  
16 it over to somebody in the Legal Department who then  
17 transmits it to the Board, so there are several inter-  
18 vening.

19 Q Before we come to those, this is your formal  
20 transmittal of the matter to Dudley Thompson?

21 A That's right.

22 Q What is Exhibit 5?

23 A Exhibit 5 is a memorandum to Tedesco explaining  
24 what we have done and our intention to pursue this one  
25 particular item on the pressurizer further by another



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piece of paper, which did not occur because of the intervening TMI accident.

Q This Exhibit 5 is dated the day before, March 27. Let's have it marked.

(The above described document was marked Moseley Exhibit 5 for identification, this date.)

Q I have here a document which is dated March 6, 1979. It's a memorandum for Edward Christenbury who is the Hearing Division director and chief counsel for OELD, which is what?

A Office of Executive Legal Director.

Q It's from a Mr. Vassallo, assistant director for light water reactors, Division of Project Management, NRR. The subject is board notification, reactor inspector, concerns regarding B&W plants. This memorandum is dated March 6, 1979, so that would predate the item we have marked as Exhibit 5. I see here that Mr. Vassallo makes the statement that he has not yet received I&E's written discussion and evaluation of these matters. Is that the document we have marked as Exhibit 5?

A No, that would be in here.

Q Let's have this marked.



1  
2 (The above described document, dated  
3 March 16, 1979, was marked Moseley Exhibit 6  
4 for identification, this date.)

5 Q The document we have marked Exhibit 6 is  
6 dated March 6, 1979. Is that the response by  
7 Mr. Vassallo to the memorandum directed to Mr. Thompson  
8 that we have marked as Exhibit 4? I am trying to get  
9 the chronology.

10 A What is the date of that?

11 Q March 6th.

12 A It looks like the same. Then there is a March 1  
13 memorandum in this document, which is from Thompson  
14 to Vassallo.

15 Q Let's have this marked.

16 (A document was marked Moseley Exhibit 7  
17 for identification, this date.)

18 Q Mr. Moseley, we have been trying to nail  
19 down the chronology with regard to the treatment of  
20 Mr. Creswell's concerns, and we have previously been  
21 provided with a stack of documents called the Creswell  
22 package. It did have an indexing on the top of it,  
23 and I see you have made reference to that as a  
24 chronological listing of how the Creswell concerns  
25 were handled through the NRC process, beginning in

1  
2 January of 1979. In looking at that list, can you  
3 just briefly describe how the Creswell concerns were  
4 routed through? We have already made reference to  
5 a memorandum of January 19, 1979, which is marked as  
6 Exhibit 3, and then a memorandum of February 28, 1979,  
7 which is marked as Exhibit 4, and I think it is at  
8 that point that the chronology began to get a little  
9 mixed up.

10 A Then there was a memorandum dated March 1, from  
11 Thompson to Vassallo, which transmitted an enclosure  
12 for further transmittal to the hearing counsel. Then  
13 a memorandum dated --

14 Q That one we do not have at this time.

15 A No, we have that in the package.

16 Q The March 1 memorandum?

17 A Yes, it's in one of these other exhibits.

18 Q It is part of Exhibit 7?

19 A Yes.

20 Q Exhibit 7 is a collection of everything  
21 that went before, Exhibits 3 and 6?

22 A Yes.

23 Q Keep going.

24 A Then the March 6 memorandum from Vassallo to  
25 Christenbury. Then there followed a memorandum of

1  
2 March 7 from myself to Thompson concerning notifica-  
3 tion of the board, stating that evaluations would be  
4 sent later. There is a memorandum from Thompson to  
5 Vassallo which transmitted the March 6 memorandum.  
6 Then there is a memorandum from myself to Thompson,  
7 dated March 28, which contained the evaluation of  
8 concerns.

9           Memorandum of March 29 from myself to  
10 Thompson advising that we may change our previous  
11 conclusion on the basis of the TMI incident. Memo-  
12 randum from Thompson to Vassallo dated March 29,  
13 forwarding the evaluation of concern for trans-  
14 mittal to the board. Then finally, a letter, March 29,  
15 sent on to the service list, which amounts to notifi-  
16 cation of the board.

17           Q       So the whole history amounts, then, to  
18 some ten memoranda, many of which include pieces of  
19 prior memoranda, and stretches over a period from  
20 January 19, 1979 to March 29, 1979, and at the end  
21 of that process, does result in notification of the  
22 board.

23           A       That's correct.

24           Q       Now, I have here a memorandum which is  
25 dated March 7, which I believe is -- there is a March

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March 12th memorandum, which is the one which was missing from this chronology, so you now have them all.

Q This was the March 12th memorandum from Thompson to Vassallo which transmitted the prior memorandum of March 6, 1979, from Vassallo to Christenbury?

A Yes.

(Continued on the following page.)

1 1 Moseley

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tp9

2 Q Is there a normal process in which a  
3 safety concern that the originators insisting should  
4 be brought up to a licensing board would be followed?

5 A It is the procedure that would be followed when  
6 this request that the board be notified -- yes, that's  
7 just the normal procedure. If, for instance, in the  
8 initial evaluation the board should be notified, then  
9 there would be fewer memorandum.

10 Q Is this the customary time frame in  
11 which these things are processed?

12 A Actually it is a little longer, because it  
13 took us longer to do the valuation than we would  
14 have liked.

15 Q Was that simply priority of work once  
16 again?

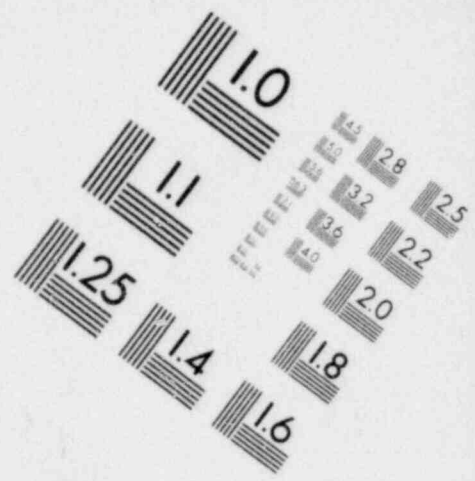
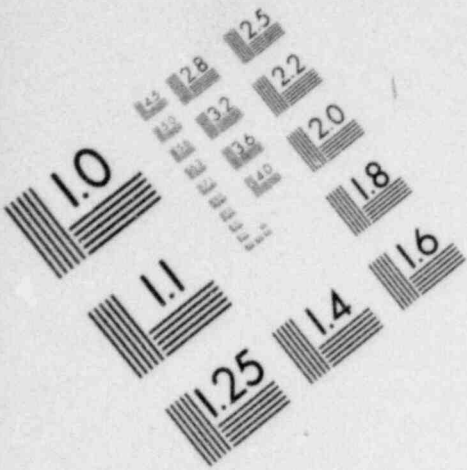
17 A It was manpower, yes.

18 Q And, again, if we can, so I can leave  
19 this subject to round it out, prior to January 19,  
20 1979, did you have any notification of any concerns  
21 by James Creswell about safety problems at Davis-  
22 Besse?

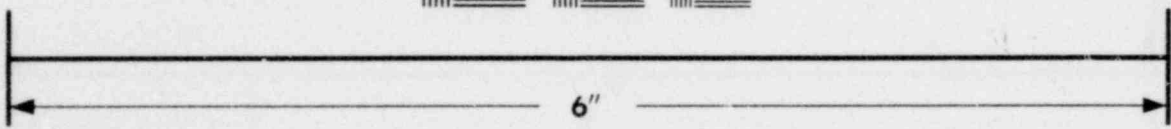
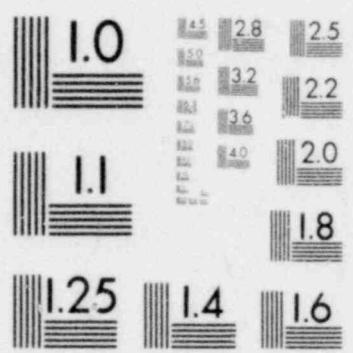
23 A I have no recollection of any knowledge  
24 prior to receipt of that first memorandum.

25 Q As of today, do you have any knowledge

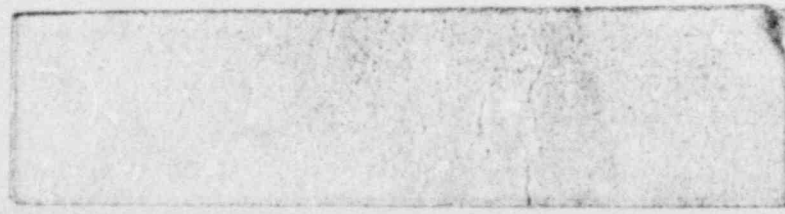
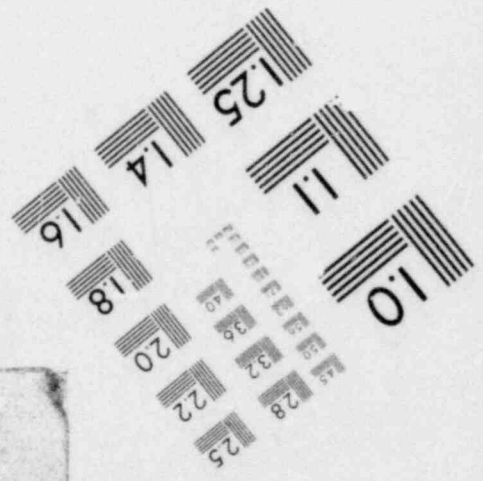
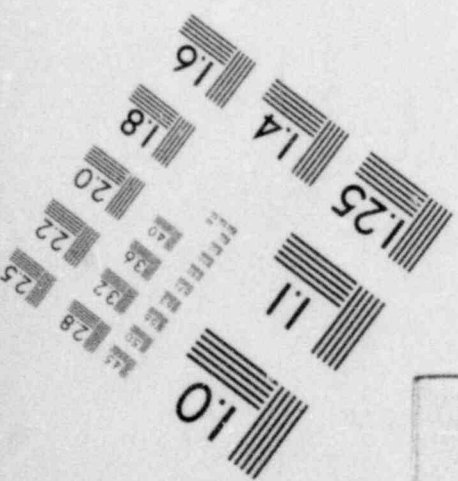




**IMAGE EVALUATION  
TEST TARGET (MT-3)**



**MICROCOPY RESOLUTION TEST CHART**



1 2 Moseley

2 concerning any investigation conducted by Region III  
3 as to the validity of Mr. Creswell's concerns about  
4 Davis-Besse transients?

5 A I am aware that an inspection was conducted  
6 at the B&W Lynchberg facilities. I believe it was  
7 sometime in January or February, I can't recall when.

8 Q When did you first become aware of that  
9 investigation having occurred?

10 A Subsequent to the Three Mile Island.

11 Q How did you become aware of it?

12 A I believe I became aware of it when the  
13 President's Commission asked for certain people to  
14 appear to give depositions.

15 Q In connection with our investigation then?

16 A Yes.

17 Q Are you aware of what determination was  
18 made as to Mr. Creswell's concerns as part of that  
19 investigation?

20 A I've not seen that investigation report. I  
21 have been told by Mr. Keppler that the investigation  
22 did not turn up any -- did not substantiate the  
23 concerns that were being looked into as part of that  
24 investigation.

25 Q As you are aware, our investigation

2 has looked into that matter and it does appear that  
3 the determination was made within Region III that  
4 Mr. Creswell's concerns constituted or related to  
5 an operational inconvenience only and not a safety  
6 concern?

7 A Yes.

8 Q Based on what you know today, the TMI 2  
9 incident, and what you know now about the prior  
10 incidents at Davis-Besse, do you concur in that  
11 determination?

12 A Well, I'm not sure what concerns were being --  
13 since I haven't read the report, I'm not sure what  
14 concerns were being --

15 Q The same ones that were raised in the  
16 January 19, 1979 memorandum to you from Mr. Thornberg  
17 and the ones which you discussed with Mr. Creswell,  
18 that is loss of pressurizer level indication off  
19 the low end of the scale, and the determination was  
20 made in Region III that that constituted an operational  
21 inconvenience only, and not a safety concern, and  
22 my question to you is, based on what you know today,  
23 do you concur in that determination?

24 A I think that the loss of pressurizer level  
25 on the low end of the scale is much less significant

2 that the problem that was experienced at Three  
3 Mile Island. That is the hangup of the pressurizer  
4 level, because what a low level in the pressurization  
5 no matter whether you are using pressure or the  
6 other parameters to monitor the status of the core,  
7 that says put more water into the core.

8 So I think it is a safety concern, yes, but  
9 it is of less magnitude than the hangup of levels  
10 that has occurred in Three Mile Island.

11 Q It is a less significant safety concern?

12 A Yes.

13 Q Fine.

14 MR. CHOPKO: For the record, Kevin,  
15 are you referring to Mr. Foster's report on  
16 the B&W inquiry?

17 MR. KANE: I am aware there is a  
18 controversy there. I believe Mr. Foster  
19 testified that that was not his determination,  
20 I believe Mr. Kohler testified that it was the  
21 determination that it was an operational  
22 inconvenience.

23 MR. CHOPKO: That is Mr. Foster's  
24 determination that you are referring to, and  
25 not Region III's determination.

2 MR. KANE: It is my understanding that  
3 Mr. Foster and Mr. Kohler were acting on behalf  
4 of Region III in conducting that investigation,  
5 is that incorrect?

6 MR. CHOPKO: The way that I understand  
7 the basis for your question, you are asking a  
8 question based on a report written by one  
9 investigator after he has talked to personnel  
10 at the Babcock & Wilcox facility at Lynchberg.

11 MR. KANE: No, I am basing my questions  
12 on the testimony given in the course of the  
13 depositions we took from Mr. Kohler and Mr.  
14 Foster and Mr. Creswell, and it is my under-  
15 standing, based on that testimony, and the  
16 documents produced in connection with that  
17 testimony, that Mr. Foster and Kohler  
18 investigated the manner as to the timeliness  
19 of B&W's evaluation; that they had been  
20 informed that NRR had previously concluded  
21 that this was an operational inconvenience  
22 only, and not a safety concern; that they were  
23 focusing on the timeliness of evaluations; that  
24 based on their investigation they concluded  
25 it had been timely evaluated and ultimately



1 6

Moseley

2 there was a briefing session in which they  
3 explained to Mr. Creswell exactly what their  
4 findings were, and they had no reason to do  
5 anything except to concur with what Mr. Creswell  
6 had already been informed of, that is, an  
7 operation inconvenience only, and not a safety  
8 concern, and there was no untimeliness in the  
9 evaluation itself.

10 MR. CHOPKO: Okay. You are basing it  
11 mostly on the Foster and Kohler --

12 MR. KANE: And Creswell.

13 MR. CHOPKO: -- deposition.

14 MR. KANE: And Anderson.

15 MR. CHOPKO: Anderson?

16 MR. KANE: And Tamber.

17 MR. CHOPKO: But you are not basing it  
18 on any document which comes from Region III  
19 that says this is the Region III position as to  
20 the loss of pressurizer level on the low end.

21 MR. KANE: I have seen so many documents  
22 over the past two weeks, I just can't recall  
23 offhand if I have seen a Region III document  
24 that specifically says that.

25 MR. CHOPKO: Okay. That's just all I

1 7 Moseley

2 wanted to know.

3 Q Mr. Moseley, I would like to get some  
4 idea of just what your involvement was with the TMI 2  
5 accident from the time you were notified of it on  
6 March 28, 1979.

7 When did you first learn of the incident  
8 at TMI 2?

9 A It was around 8 o'clock when Mr. Davis called  
10 me, I believe, first, and said did I know what was  
11 going on in Three Mile Island, and I told him I did  
12 not. However, I would try to find out. And he  
13 subsequently appeared in my office, and I had in  
14 the interim, I told one of my staff members to call  
15 Region I, and when Mr. Davis appeared in my office,  
16 we -- I called Mr. Greer, and we got an update briefing  
17 from him, which was all they knew at that time.

18 Q Did you go to the Instant Response  
19 Center at any time on March 28?

20 A Yes. Almost immediately after talking with  
21 Mr. Greer, I went to the -- I went to the Instant  
22 Response Center, and had my staff members report there  
23 also.

24 Q What was your function at the IRC?

25 A I had the -- in that particular event, I had

2 the title of IRAT director.

3 Q What is the function of an IRAT  
4 director?

5 A The function is to direct the people who are  
6 involved in gathering information from the site or  
7 wherever we were gaining information, and to assess  
8 this and to keep the EMT informed, and if the  
9 recommendations are to be made for actions by the EMT,  
10 to make those recommendations.

11 Q That is to make recommendations to the EMT  
12 for action to be taken?

13 A By the EMT, yes.

14 Q The EMT is the Emergency Management Team?

15 A Yes.

16 Q Would one of your functions as IRAT  
17 director be to determine the propriety of any pro-  
18 posed action that the licensee wants to take in  
19 dealing with the accident?

20 A Well, it is to keep advised of the actions  
21 that the licensees are taking, and to see that  
22 those actions are evaluated by people here to see  
23 that the things that are required to be done and  
24 should be done. It is not there specifically not to  
25 approve licensee actions.

2 Q It sounds more like the function of a  
3 conduit. You pass through information, make sure it  
4 gets to where it needs to go, make sure it is evaluated,  
5 and make sure the evaluation comes back through again.

6 A Well, let me say that the EMT and the IRAT  
7 do not have a direct function for the licensee. Our  
8 mission is to assess what the licensee is doing, not  
9 to direct the licensee, and not to approve those things  
10 that the licensee does.

11 Q If, on the other hand, a licensee, let  
12 us take the TMI 2 situation, if you were the director  
13 of IRAT, and the licensee wanted to do a particular  
14 thing in dealing with the accident, if you felt that  
15 was highly inappropriate, it is a terrible thing to do,  
16 what would you or could you do?

17 A I would first advise against it and ask that they  
18 consider it and, you know, ask questions about what  
19 about this and what about that, and what about the  
20 other thing.

21 If it was sufficiently unsafe in my view, then  
22 I would probably say you ought not to do that. If it  
23 came to an order, that should come from the EMT.

24 Q So you would advise against it?

25 A Yes.

2 Q And if you felt that your advice was not  
3 going to be followed, and you felt sufficiently strong  
4 about it, would you go to the EMT?

5 A Yes.

6 Q And request --

7 A -- them to order the licensee to not do this  
8 or to do that.

9 [Continued on next page.]

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T-10

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2 Q And presumably as IRAT director your re-  
3 quest would be given due weight?

4 A Presumably.

5 Q As you understood it, it was the EMT that  
6 had the authority to order the licensee to do or not  
7 to do certain things?

8 A That's correct.

9 Q And that would not be the function of the  
10 IRAT director?

11 A That's correct. Although I would, you know, if  
12 I felt strongly that something was happening right  
13 then, and what have you, I am sure my voice would carry  
14 the feeling that you better not do that.

15 Q About seven and a half hours into the event,  
16 there was a decision made by the licensee Met Ed that  
17 they should attempt to rapidly depressurize the system.  
18 That was just mentioned in the NRC sequence of events.  
19 It has come up in a number of contexts.

20 Were you familiar with that determination  
21 by Met Ed at the time they made it, were you informed  
22 of that?

23 A I was aware that they were in the process of or  
24 they had elected to depressurize. I was not aware,  
25 as it turned out later, that they intended to

1  
2 depressurize to an intermediate position to, as they  
3 call it, float on the cumulator tanks.

4           It was my understanding that their intention  
5 was to depressurize and go onto the low pressure in-  
6 jection or RHR coolant.

7           Q       That would normally be the reason to de-  
8 pressurize, wouldn't it, under the circumstances they  
9 had at that time?

10          A       That's correct.

11          Q       To try and go onto decay heat removal?

12          A       Yes.

13          Q       And as I understand it, the reason to  
14 attempt to go to decay heat removal would be to ultimately  
15 achieve a cold shutdown, right?

16          A       Yes, to ultimately get there, yes.

17          Q       Would it also be true in rapidly depres-  
18 surizing, they would be attempting to force voids out  
19 of the system that were currently in there?

20          A       There are several things that may have been  
21 done at that time. One thing would have been to open  
22 the PRV and to continue to inject with the high pres-  
23 sure system, to simply get more water into the system.

24                   They may have done that and throttle flow  
25 somewhat, and allowed pressure to decay, and sort of

1  
2 continue to put water in, and you could get the ac-  
3 cumulated action at a later time, but get down to  
4 the point where you can have both the low and the  
5 high injection going on.

6 Q But at the time that you were first made  
7 aware of the fact that they were attempting to de-  
8 pressurize, you thought they were trying to depressurize  
9 all the way down to decay heat removal?

10 A Well --

11 Q You thought that was the intent?

12 A I wasn't thinking, really, in terms of really  
13 getting to cold shutdown so much as I was getting the  
14 core-flooded, and the low-pressure pumps of a higher  
15 flow rate capacity so you can get more water in quicker  
16 at a lower pressure.

17 Q So again, my question is, at the time you  
18 became aware that the Met Ed was attempting to rapidly  
19 depressurize, you understood that what they were trying  
20 to do was to go all the way down to decay heat removal?

21 A Yes.

22 Q And it turned out later on they were not  
23 intending to do that, they were intending an intermediate  
24 depressurization?

25 A Yes. They went down to an intermediate level, and

1  
2 got some comfort from the actions of the accumulators.

3 Then later they did attempt to go down  
4 to a pressure to put on the decay heat removal pumps,  
5 and the pressure hung up, and they weren't able to  
6 get down --

7 Q When they started the depressurization,  
8 was it in fact a situation where they were trying to  
9 depressurize all the way and then they got down to the  
10 intermediate level and decided to take some comfort  
11 in that?

12 A There was a difference of what my perception was  
13 at the time and what I now know or believe to be their  
14 intention.

15 Q I see.

16 A What I now believe to be their intention was that  
17 they were coming down to float on the accumulators, and  
18 they had not intended to go all the way down to the  
19 decay heat.

20 My understanding of that on March 28th  
21 was that they were going directly down to a low enough  
22 pressure to get the decay heat pumps operating.

23 Q At the time that you were informed of that,  
24 did you feel that was an appropriate step to take?

25 A Yes.

1  
2 Q Based on what you know today, do you  
3 feel that was an appropriate step to take?

4 A I think that the pressurization, repressuriza-  
5 tion, and starting the recirc pump was a better thing  
6 to have done.

7 Q So it would have been to repressurize?

8 A It would have been better to do what was ul-  
9 timately done.

10 Q Which was after attempting to depressurize,  
11 they ultimately came to the conclusion that they should  
12 repressurize?

13 A That's correct.

14 Q What is it that you know today that indicates  
15 to you that the depressurization was not a more appro-  
16 priate thing to do at the time?

17 A Because of the amount of super heat that was  
18 there, and the temperatures that were -- that the fuel  
19 had reached, it is likely that, you know, a significant  
20 portion of the core would have been uncovered before  
21 reaching the lower temperature. Maybe all the way,  
22 I don't know.

23 Q So it could have been a highly inappropriate  
24 thing to do? Core uncovering is a very bad thing, isn't  
25 it?



1  
2 A The damage had already been done, you see.  
3 There was a certain amount of damage that had already  
4 been done, if ultimately it had to cool the core, so  
5 it is hard for me to say that that would have been a  
6 very bad thing to do. Had they not been able to  
7 start the reactor coolant pumps or ultimately, you  
8 would have a coolant to the core, even if it allowed  
9 some additional damage to occur.

10 Q But again, based on what you know today  
11 about the core temperatures, et cetera, if they had  
12 persisted in attempting to depressurize and had never  
13 gone to repressurization, what would have occurred?

14 A - I am not sure, but let me just say that it is  
15 probable that additional damage would have been done  
16 to the core.

17 Q And again, so we can focus, the information  
18 that you would have liked to have had at that time in  
19 properly evaluating this depressurization, would have  
20 been temperatures in the core?

21 A The in core thermocouple readings would have  
22 been very useful in making that determination.

23 Q You did not have that information at that  
24 time?

25 A That's correct.

1  
2 Q Why didn't you have that information?

3 A It wasn't provided to us. I know now that during  
4 that time period there were people on site who had  
5 some knowledge of these temperatures, but they didn't  
6 believe them.

7 Q What was the difficulty in providing that  
8 information to you?

9 A Not believing the information, I presumed was  
10 the motivation for not passing it along.

11 Q Who was it that did not believe it?

12 A I understand Mr. Miller didn't believe it. He  
13 was the one that I have now some knowledge of, that  
14 he knew of it.

15 Q Mr. Miller of Met Ed?

16 A Yes.

17 Q And why didn't Mr. Miller believe the in-  
18 formation he had?

19 A You will have to ask Mr. Miller.

20 Q He didn't tell you that?

21 A No.

22 Q Did he tell you or are you aware of how  
23 he got that information?

24 A Well, as I understand it, he got the information  
25 from potential tear reading from the thermocouples,

1  
2 since the computer was not programmed to print higher  
3 than, I believe, 700 degrees.

4 Q And in fact, of course, the temperatures  
5 went substantially in excess of 700 degrees?

6 A Substantially.

7 Q Has anyone investigated why the computer  
8 was programmed only to read up to 700 degrees?

9 A I don't know that anyone has made an investiga-  
10 tion. I believe the reason was that this was not ac-  
11 cident instrumentation, this was operational instrumen-  
12 tation. It was not installed to be used in monitoring  
13 accident situations.

14 Q Was there any instrumentation installed in  
15 place at TMI on March 28th, which had been installed  
16 to monitor in core temperatures under accident con-  
17 ditions?

18 A In core?

19 Q Yes.

20 A Not to my knowledge.

21 Q Is there any consideration today of the  
22 requirement to have in core temperature reading devices  
23 that can function under accident conditions?

24 A I expect that that which is under consideration  
25 by the licensing group, but I can't give you personal

1  
2 knowledge of that.

3 Q It is not in the Lessons Learned interim  
4 report, is it?

5 A I don't recall it being in there, either, but  
6 Lessons Learned has long term and short term. What  
7 you have seen is short term recommendations.

8 Q On the other hand, if you have another  
9 scenario in which you have high core temperatures under  
10 accident conditions at other plants, that also lack  
11 that instrumentation, you are going to be in the same  
12 position as you were in TMI 2, you are not going to  
13 have that information?

14 A - I don't -- I think our lines of defense are  
15 going to be long before that point. We are working  
16 diligently to preclude getting in this situation again.

17 Q Sure. But if it came to it, you still  
18 wouldn't know what the temperature was in the core,  
19 would you?

20 A Lacking a requirement and having those things  
21 there, you would not know. As you know, all plants  
22 don't have those thermocouples at all.

23 Q Yes. Do you know how many plants actually  
24 lack any thermocouples?

25 A I don't know.

1  
2 Q Is it true that at TMI 1, the thermo-  
3 couples were installed, but they were never hooked  
4 up to the instrumentation board in the control room?

5 A I don't know that.

6 Q Do you know if there was any requirement  
7 for in core thermocouples at older plants in the  
8 United States, say over ten years old?

9 A I really don't know, but I suspect not.

10 Q Did anyone in the IRC officially or formally  
11 concur in the determination by Met Ed that they should  
12 rapidly depressurize?

13 A No. There really isn't a concurrence function  
14 here, and so there wouldn't have been a concurrence.  
15 There may have been and probably were some questions  
16 as to why don't you do this.

17 Q Suggestions along those lines?

18 A Suggestions, maybe; it is certainly questions,  
19 have you considered this.

20 Q Did anyone in the IRC object to the determin-  
21 ation by Met Ed that they should attempt to rapidly  
22 depressurize?

23 A None that I heard.

24 Q Did you discuss the rapid depressurization  
25 question with Mr. Stello at the IRC at the time it



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came up?

A We must have. There was general discussion. He must have been included, but I don't have specific recall.

Q Did you have any doubts about whether or not that was the appropriate thing to do at that time?

A At that time I really didn't have doubts that that was an appropriate thing to do.

Q Was there anything else you would have needed to adequately assess the depressurization option besides temperature in the core?

A - Well, yes. If you had some way of knowing what the non-condensable gasses were, that would help in that assessment. The amount of super heat, which the temperatures really ultimately lead to is helpful information.

(Continued on the following page.)

1  
2 Q You didn't have any of that information  
3 at that time either?

4 A That's correct.

5 Q I am sure you have heard about the Novak  
6 memorandum before now, Mr. Moseley, it's been discussed  
7 a good deal. It was a memorandum generated in January  
8 of 1978 over Mr. Thomas Novak's signature from the  
9 Reactor Systems Branch. It apparently was drafted for  
10 his signature by Mr. Sandy Israel.

11 When did you first learn of the Novak  
12 memorandum?

13 A Subsequent to Three Mile Island. I don't know  
14 the exact date, but it was sometime later.

15 Q Was it very soon after?

16 A Not really. It was probably -- it was many days,  
17 if not weeks, after.

18 Q I see.

19 How did you become aware of it?

20 A I believe, I don't know, I guess -- I believe it  
21 was mentioned in ACRS meetings, and I subsequently  
22 obtained a copy of it. It was either that or in a  
23 Commission meeting, I don't recall where, but I took  
24 the initiative to get a copy of it after it had been  
25 mentioned to me.

1

2 Q Have you acquired any information as to how  
3 the Novak memorandum was circulated within the NRC before  
4 March 28, 1979?

5 A I have no indication other than there was some  
6 CC's listed on the memorandum, and I presume those people  
7 saw it.

8 Q Anything beyond that information?

9 A I have no other information.

10 Q I am sure you have also heard of the Michelson  
11 report?

12 A Yes.

13 Q Because that's been discussed quite a bit,  
14 and as I understand it, there are at least three versions  
15 of the Michelson report, two handwritten versions and a  
16 typed version. Have you seen any of the versions of  
17 the Michelson report?

18 A I have seen the typed version, yes.

19 Q And when was the first time you saw the  
20 typed version of the Michelson report?

21 A It was subsequent to the Three Mile Island accident.  
22 I don't again recall the exact time. I received it as  
23 an attachment to a memorandum that, as I recall, Eisenhut  
24 signed, and this was days after the Three Mile Island  
25 accident.

1  
2 Q Do you recall what that Eisenhower memorandum  
3 concerned?

4 A As I recall, it simply said here is something  
5 that was provided by Mr. Michelson some time ago for  
6 your information. It was just more like a transmittal  
7 memorandum.

8 Q Do you have any information as to who within  
9 the NRC saw any version of the Michelson report typed  
10 or handwritten prior to March 28, 1979?

11 A I have been told that Mr. Israel saw it, and I  
12 have been told that one of the members of the ACRS, I  
13 can't remember his name right off the top of my head --

14 Q Would that be Mr. Ebersole?

15 A Yes.

16 Q Mr. Jesse Ebersole?

17 A Yes.

18 Q Do you know whether anybody connected with  
19 the NRC saw the Michelson report before March 28, 1979?

20 A I don't know of others. I have only been told  
21 of their having access to it.

22 Q Do you have any information that anyone  
23 within B&W seeing the Michelson report before March 28,  
24 1979?

25 A I have no information about that.

1  
2 Q There were several transients which  
3 occurred prior to March 28, 1979 at TMI 2 itself,  
4 which concerned some aspects of things which did occur  
5 on March 28, 1979. One of them occurred on March 29,  
6 1978, almost one year to a day before the incident  
7 itself, in which the PORV stuck open.

8 Are you familiar with that transient?

9 A I have heard of that transient, but I am really  
10 not familiar with the details of it.

11 Q Have you reviewed the LER that relates to  
12 that transient?

13 A I suspect I have, you know, as part of this thing  
14 I talked about earlier, but I don't have specific  
15 recollection now of that event.

16 Q Have you determined where that LER on that  
17 transient went within the NRC?

18 A I haven't.

19 Q Have you determined whether any evaluation  
20 was made by the NRC as to the significance of that LER  
21 which was submitted on that event?

22 A I haven't.

23 Q Isn't that a subject that, again, in  
24 evaluating the TMI 2 situation, and looking to the  
25 lessons learned aspect of that event, that you want to



1

2 know?

3 A I think I will want to look into that type of  
4 thing again when I get to the point that I can direct  
5 my attention to what should we do to our inspection  
6 program in the future. The things that I have been  
7 doing since the Three Mile Island accident have not  
8 led me to believe that that is something that I needed  
9 to know at this point in time.

10 Q Have you determined whether or not the NRC  
11 made any attempt, any division of the NRC, made any  
12 attempt to notify the licensees of that kind of problem  
13 relating to PORV's before March 28, 1979?

14 A - I know of no such notification.

15 Q Are you aware of any follow-up action that  
16 was taken by the NRC after March 29, 1978, as a result  
17 of that event at TMI 2 and before March 28, 1979?

18 A Could you repeat that?

19 Q I was using two dates. I am fixing the  
20 period before March 19th, and I am addressing it to the  
21 transient which occurred on March 29, 1978 at TMI 2.

22 Are you aware of any follow-up action taken  
23 by the NRC in connection with that transient?

24 A That may have been included in one of the things.  
25 I really haven't checked for it. I haven't looked for

1  
2 that particular one. However, there was a Current  
3 Event which was published December 1977 which had the  
4 Davis-Besse event in it, and --

5 Q Is that the one that describes the  
6 September 24, 1977 transient at Davis-Besse?

7 A Yes.

8 Q Could you look at that description and tell  
9 me if you find anywhere in that description any descrip-  
10 tion of the operators' interruption of the HPI in  
11 connection with that transient?

12 MR. CHOPKO: Identify the document for the  
13 record.

14 MR. KANE: We will do that.

15 A No, I don't find any reference in here to that.

16 Q Can you think of any reason why operator  
17 interruption, premature interruption, of the HPI would  
18 have been left out of a description of that event that  
19 was distributed to licensees by the NRC?

20 A I don't believe that it was generally recognized  
21 that the pressurizer had hung up in this event until  
22 after the Three Mile Island event, and then in retro-  
23 spect, you go back and look at it, and it becomes more  
24 clear to you, but I don't think that was clearly  
25 recognized.

1  
2 Q When you say the pressurizer level hung up,  
3 do you mean went off scale high?

4 A I mean it may have been water in the pressurizer  
5 held by a steam pressure in the line leading to it.

6 Q In other words, somewhat the same situation  
7 as at TMI 2?

8 A Apparently now in retrospect there was some element  
9 of that. I don't believe that is recognized in the  
10 initial evaluation events.

11 Q Yes, but given the fact that the operator  
12 on September 24, 1977 at Davis-Besse turned off the  
13 HPI, caused voiding in the system, and then ultimately  
14 realized his mistake and closed the block valve of the  
15 PORC and turned on the HPI again. Totally aside from  
16 TMI 2, a premature interruption of a major safety  
17 system like HPI is a significant matter, isn't it?

18 A When you identify that it is premature interruption,  
19 yes.

20 Q Would it always be a premature interruption  
21 if you had formation of voiding in the core or in the  
22 primary cooling system?

23 A If that voiding resulted from turning it off, yes.

24 Q As I understand that was the situation on  
25 September 24, 1977.

1  
2           Isn't that the kind of thing that should be  
3 included in this circular which is sent out by the NRC  
4 to licensees?

5 A       Had it been recognized as that, it should have  
6 been.

7           Q       Can you think of any reason why it wasn't  
8 recognized?

9 A       No, I can't justify it, because now in retrospect,  
10 it seems much clearer than it did at the time.

11          Q       Isn't it a violation of the technical  
12 specifications for the operator to prematurely terminate  
13 HPI?

14 A       The tech specifications don't address that  
15 specifically.

16          Q       Isn't it a violation of any procedure  
17 established by the NRC or approved by it to prematurely  
18 terminate HPI under these circumstances?

19 A       The bulletins now require the HPI to stay on until  
20 certain conditions are satisfied. No such requirements  
21 existed prior to Three Mile Island.

22          Q       I see. And so if I understand it, the  
23 best explanation you can come up with why in the text  
24 HPI is not mentioned in the bulletin that we have been  
25 discussing here is simply because the significance of

2 that facet of the transient was not recognized at the  
3 time?

4 A That's my belief.

5 MR. KANE: Let us have that marked as--

6 MR. CHOPKO: Is this already an exhibit  
7 to the Creswell deposition? I note for the record  
8 that the document that was being discussed in this  
9 portion of the deposition is entitled "Current  
10 Events, Power Reactors," published by the USNRC,  
11 December 1977. That reviews events based on  
12 operating experience at nuclear power plants from  
13 September 1st to October 31st, 1977.

14 (The above-described document was marked  
15 Moseley Exhibit 8 for identification, this date.)

16 Q We have now marked this document, Current  
17 Events Power Reactor, as Exhibit 8 for this deposition,  
18 Mr. Moseley, and if I understood what you said, this  
19 is a document which is prepared by the NRC.

20 A Yes.

21 Q And is distributed to licensees, is that  
22 correct?

23 A Correct.

24 Q Is this kind of a newsletter to NRC licensees  
25 to inform them of events that have occurred at other



2 power plants?

3 A Yes.

4 Q What is the purpose behind keeping them  
5 informed about that kind of thing?

6 A It is to assist them in identifying things that  
7 might be troublesome in their plants, and might be  
8 problems in their plants.

9 Q So that they can then take appropriate  
10 steps to change their procedures or instruct their  
11 operators or something like that?

12 A That's right, even though there is not a require-  
13 ment to do it, it is information they could use for  
14 that purpose.

15 MR. KANE: Let me jump back for a moment,  
16 since I see that through my oversight we neglected  
17 to have marked a previous exhibit which we had been  
18 discussing. This is a document dated March 12,  
19 1979. It is a memorandum from Mr. Vassallo of  
20 NRR from Dudley Thompson of I&E concerning infor-  
21 mation for board notification.

22 Q Again, this is a transmittal memorandum in  
23 connection with Creswell's concern as to Davis-Besse,  
24 is that correct?

25 A That's correct.

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2 MR. KANE: Let us have this marked as  
3 Exhibit 9.

4 (The above-described document was marked  
5 Moseley Exhibit 9 for identification, this date.)

6 Q Mr. Moseley, prior to March 28, 1979, did  
7 you have any recognition of the fact that at TMI 2  
8 they were having a troublesome amount of valve leakage?

9 A No, I was not.

10 Q Would leaking valves be the kind of thing  
11 that would come to the attention of the I&E Division?

12 A Yes, to the inspector.

13 Q Would they be covered in LER's?

14 A Some might. It depends on where the valve is and  
15 how much the leakage is.

16 Q Prior to March 28, 1979, would the leakage  
17 around the PORV valve be the subject of a Licensee  
18 Event Report?

19 A No.

20 Q And why not?

21 A There are limits on both known and unknown leakage  
22 within containment, and as long as those limits are  
23 complied with, then there is no other requirement on  
24 leakage for valves, with the exception that there are  
25 leakage requirements for valves whose function is

1  
2 containment integrity.

3 Q Containment integrity, that is the contain-  
4 ment building around the reactor?

5 A Yes.

6 Q The reason I asked that question is because  
7 the Commission has already had testimony from some of  
8 the operators who were in the control room at the time,  
9 and one of the questions has come up several times is  
10 why the operators did not rely upon tailpipe temperature  
11 readings in order to know if the POVC was jammed open,  
12 and the explanation they received from the operator was  
13 although his operating procedures called for him to  
14 recognize that they had a problem with the PORV, the  
15 tailpipe temperature was in excess of 130 degrees, in  
16 fact, due to regular leakage around the valve, they were  
17 getting regular readings as high as 195 degrees, and he,  
18 of course, had an alarm that would register on the  
19 computer when he reached 200 degees, but he was coming  
20 very close to that point on a regular basis prior to the  
21 accident. As a result, when he had a reading as high  
22 as 232 degrees, which he recalls getting at a certain  
23 point, it still didn't mean anything to him, because he  
24 had already leakage in the past that came up to as close  
25 as 200 degrees.

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2                   What I am wondering is whether those regular  
3 readings as high as 195 degrees on the PORV would come  
4 to the attention of the NRC in the ordinary course, and  
5 I think what you have told me is they would not, is that  
6 right?

7 A       They are not required to be reported.

8       Q       Is there any kind of requirement for that  
9 leakage reporting now?

10 A       No.

11       Q       Are you aware of any reports made to the  
12 NRC concerning maintenance problems at TMI 2, that is  
13 lack of personnel or shoddy standards in terms of keeping  
14 things clean at TMI 2?

15 A       I am not specifically aware of that.

16       Q       No problem like that has come to your  
17 attention in connection with TMI 2, is that right?

18 A       I now know that they had many leaking valves, and  
19 these may have been caused by lack of attention or lack  
20 of manpower in the maintenance area, but prior to the  
21 event, I had no such knowledge.

22       Q       And to this day, there is still no require-  
23 ment that those kinds of things be reported to the NRC,  
24 is that right?

25 A       Unless the malfunction effects the operability

1  
2 of a safety system, it is not reportable.

3 Q Let me take you to what I think is a  
4 containment safety system.

5 On September 7, 1978, the licensee Met Ed  
6 discovered a containment isolation valve had failed to  
7 close due to a dirty relay, and that was apparently  
8 the subject of an LER, which was submitted on September 27,  
9 1978.

10 Did that come to your attention prior to  
11 March 28, 1979?

12 A To my personal attention specifically, I don't  
13 recall that, no.

14 Q Did it come to anyone else's attention  
15 within your division?

16 A If an LER was submitted on it, it obviously  
17 did come to my people, yes.

18 Q You say "obviously," but I think before you  
19 were testifying to the effect that due to manpower  
20 problems, et cetera, this was a situation where only a  
21 sampling of these things are, in fact, examined. Do  
22 you know if this particular LER --

23 A It is more like most of them are done, but some  
24 of them are done very hurriedly.

25 Q Do you know if this was done hurriedly



1

2 or --

3 A I can't state it.

4 Q Do you know if your division instituted  
5 any follow-up action to determine why a containment  
6 isolation valve had failed to close due to a dirty  
7 relay?

8 A A dirty relay is not an unusual event. Dirt  
9 doesn't necessarily mean filth, it might mean just  
10 some coating on the electrodes. So this maintenance,  
11 preventive maintenance to clean relays is a normal  
12 practice in plants, because these films do occur.

13 Q Do you know how that preventive maintenance  
14 on the relay at TMI 2 was conducted?

15 A I don't know.

16 Q Do you know if anyone in NRC has made that  
17 kind of evaluation to determine how often that was done?

18 A I don't know.

19 Q Is a containment isolation valve a safety-  
20 related device?

21 A Yes.

22 Q Is it the kind of device, you would most  
23 definitely want to function?

24 A Of course we would want it to function, yes.

25 Q If it failed, could it, in fact, result in

1 a release of radioactivity to the environment?

2 A Failure of one valve will not result in release  
3 of radioactivity to the environment.

4 Q I would like to talk a little bit about  
5 the whole containment isolation situation at TMI. It  
6 is my understanding that the containment isolation at  
7 TMI 2 was actuated upon psi in the containment building.

8 It is also my understanding that under the  
9 standard review plan, it is required that containment  
10 isolation be actuated on at least two out of three  
11 principles. The principle being, or the factors being  
12 radiation, psic in the containment building or HPI  
13 actuation.

14 Do you know why TMI 2 was not required to  
15 have containment isolation triggered by more than just  
16 psi in the containment building?

17 A The present standard review plan was -- came along  
18 at a period of time after the TMI 2 had -- let me start  
19 over.

20 Whenever a new version of a standard review plan  
21 comes out, a conscious decision is made as to how it  
22 will apply to plants. It is always forward looking,  
23 but then to the extent back-fitting or the point at which  
24 you require plants who are in process to do it, there is  
25

1  
2 a conscious decision that has to be made as to which  
3 plants this applies. My understanding is that this  
4 standard review plan was specifically not made applicable  
5 to Three Mile Island.

6 Q Is containment isolation actuation a safety-  
7 related item?

8 A Yes.

9 Q Does it strike you as unsafe to have a  
10 situation where containment isolation actuation is based  
11 only on one event rather than on at least two?

12 A My preference would be to have the containment  
13 isolation initiated on more than one event. It is not  
14 unsafe, I guess we have made a decision that it is not  
15 unsafe, otherwise no plants would have been approved  
16 with that design.

17 Q Do you feel it is unsafe if the containment  
18 design is also coupled with an automatic sump pump  
19 feature which automatically removes radioactive water  
20 from the sump to the auxiliary building?

21 A Again, I think it is preferable not to do that.  
22 As you may or may not know, in the Three Mile Island  
23 event, initially it was thought that the source of some  
24 of the radioactive releases from the Three Mile Island  
25 was from water that was spilled on the floor of the

1  
2 auxiliary building as a result of pumping these sumps.  
3 It turned out on later examination that this did not  
4 contribute to this event.

5 Q But you still don't feel it is a preferable  
6 situation to have an automatic sump pump feature  
7 combined with a containment isolation system which  
8 actuates only on psi?

9 A That's correct.

10 Q Why not?

11 A Because I think that the -- there is a possibility  
12 that you could release some radioactivity from the  
13 source, so I would feel that a better way, and a safer  
14 way of doing it, is not to have these features, to have  
15 the containment isolation, for instance, hooked to --

16 Q Are there any other plants operating in the  
17 United States at the present time where containment  
18 isolation is actuated only on psi in the containment  
19 building?

20 A I haven't made a survey of all of these things.  
21 I really don't know.

22 Q Based upon the situation you just described  
23 concerning TMI and the SRP plan, would it be your  
24 expectation that there are such other plants?

25 A Yes, it would.

1  
2 Q TMI was not the only one that was relieved  
3 from certain portions of compliance from the SRP, is  
4 that right?

5 A Well, I wouldn't say it that way. I would state  
6 that the SRP's are made specifically applicable to  
7 certain plants, so they are really not excused as much  
8 as they are simply not included.

9 Q Okay. Let me rephrase it then.  
10 There are other plants which were simply  
11 not included the same way TMI was not?

12 A Yes.

13 Q And those plants could well have the same  
14 type of actuation mechanism?

15 A Yes, they could.

16 Q And that is tying it only to psi in the  
17 containment building and not to anything else?

18 A That's possible.

19 Q Do you know what the volume of the contain-  
20 ment building is at TMI 2?

21 A Very large, I don't know the number. Many cubic  
22 feet.

23 Q Is an automatic sump pump an unusual  
24 feature in a reactor containment building?

25 A There are some that don't have automatic sump



1  
2 pumps. There are some that do. So the answer I  
3 guess is no, it is not unusual. There are others that  
4 have it.

5 Q And as far as you know, as of today, those  
6 plans still have those features?

7 A As far as I know.

8 Q I would like to jump back for a minute to  
9 your situation in the Incident Response Center on  
10 Wednesday, March 28, 1979.

11 After you arrived at the Incident Response  
12 Center, was there any discussion about the core becoming  
13 uncovered?

14 A - Not early on. Sometime during the day it became  
15 obvious that the core had to have been uncovered at some  
16 point in time.

17 Q What made that obvious to you?

18 A Well, in order to have the amount of activity  
19 that was seen in the primary coolant system, there had  
20 to be some core damage, which would almost have required  
21 the core to be uncovered.

22 Q Did you discuss that with people at the  
23 Incident Response Center?

24 A Well, we discussed the core damage, that there  
25 was some damage to the core, yes.

1

2 Q And in connection with that, did you  
3 discuss what was causing that, i.e., the core uncovering?

4 A We must have. I am sure we must have.

5 Q Would you have discussed that with  
6 Mr. Stello?

7 A Among others, I am sure we did.

8 Q Did you discuss that with members of the  
9 emergency management team?

10 A It is sort of like everybody knew it. It is  
11 not the kind of thing that would be startling to anyone  
12 there, so it is not the kind of thing that you would  
13 run to say, hey, this has occurred.

14 - Q Wouldn't there have been other people at  
15 the Incident Response Center who didn't know enough  
16 about how a reactor worked to be able necessarily to  
17 make the connection between core damage and core  
18 recovery?

19 A I am sure there are, yes.

20 Q So for those people it wouldn't be just  
21 assumed, they would presumably hear it, they would know  
22 about it from talking with people?

23 A I don't -- I wasn't in the emergency EMT. They  
24 may well have discussed this among themselves.

25 Q Were you called upon at any point on

1  
2 March 28 to brief the EMT as to what was going on as  
3 far as you knew?

4 A Not in terms of a briefing, no, I didn't.

5 Q Not a formal thing, but just to explain  
6 what you knew, what you were hearing?

7 A I talked with various members of the EMT who would  
8 drift in to the IRAT to discuss it, but I don't recall  
9 on that day, you know, appearing before them as a body.

10 Q Did you talk with any of the commissioners  
11 of the NRC on March 28, 1979?

12 A I believe there were two of the commissioners who  
13 were in the IRAT for portions of the time on March 28th.

14 Q Which commissioners were those?

15 A Commissioner Ahearne and Commissioner Bradford,  
16 as I recall.

17 Q And they came into the IRAT where you were  
18 physically located?

19 A Yes.

20 Q And did they talk to you about what was  
21 going on at that point?

22 A We must have had some conversations. They were  
23 mostly listening.

24 Q Did you discuss with them the core damage?

25 A I don't recall specifically discussing that with

1

2 them.

3 Q Would that have been something that was on  
4 your mind at the time?

5 A Yes, it was on my mind.

6 Q So to the extent that you have been talking  
7 to them at all what you knew about the plant situation  
8 you probably would have mentioned that, wouldn't you?

9 A I don't know. You see, their role there was  
10 ill-defined, and I didn't feel compelled to brief them  
11 in any way. I responded to questions, but I had other  
12 things to do, and I didn't really pay much attention  
13 to them, frankly.

14 Q Do you think it is possible that anyone in  
15 the IRC for any appreciable time on March 29, 1979  
16 would not have known that there was a core uncovering?

17 A I don't think there was anyone who had responsi-  
18 bility for assessing what was going on who would not  
19 have known that. There may have been people who had  
20 other responsibilities who may not have known that.

21 Q But the people who had responsibility for  
22 assessing the situation would certainly have known?

23 A I think so, yes.

24 Q Was Chairman Hendry at the IRC at any time  
25 on March 29th?

1

2 A I didn't see him on that day.

3 Q Did you speak with Chairman Hendry at any  
4 point concerning what you knew about the status of the  
5 situation?

6 A No.

7 Q Let me jump over to March 29th. Did you  
8 speak with Chairman Hendry on March 29th about what  
9 you knew?

10 A No.

11 Q Did you brief any of the commissioners of  
12 the NRC on March 29th as to what you knew about the  
13 plant situation?

14 A - No, I don't recall.

15 Q Did you speak to Darrell Eisenhut on  
16 March 29th concerning what you knew about the plant?

17 A I don't know.

18 Q Were you called upon to brief anyone from  
19 the NRC for the purpose of allowing or enabling that  
20 person to then brief the NRC commissioners?

21 A Well, I think my exchange of information would  
22 have been more in terms of answering questions that  
23 people may have had. People may have come to me and  
24 asked a question and I would answer and they would use  
25 that in briefing others. That may have happened, but



1  
2 I was not knowingly participating in preparation for  
3 briefings.

4 Q Do you recall having anybody come to you  
5 and say, "Look, I need to know some information because  
6 I have to be called upon to brief the commissioners  
7 later on today"?

8 A No one told me that specifically, to the best of  
9 my knowledge.

10 Q The reason I am asking this, as of yesterday,  
11 we did speak to Mr. Stello, and he does recall that in  
12 the morning of March 29th, Darrell Eisenhut had  
13 Mr. Stello brief him, because Eisenhut was then going  
14 to have to go and brief the commissioners, and I am  
15 wondering if Mr. Eisenhut spoke to you about the same  
16 thing.

17 A Well, like I say, he may have well have discussed  
18 some things with me, but I wasn't aware or at least I  
19 don't recall being aware that he was gathering this  
20 information specifically to brief anyone.

21 Q Let me just jump back a few minutes to the  
22 I&E functions in analyzing LER's and in determining  
23 what safety concerns are.

24 How does the I&E determine whether or not  
25 a safety concern is or is not generic?

1

2 A It is a judgment based on knowledge of whether  
3 or not this particular piece of equipment is used by  
4 others or may be used by others. That's it. It is  
5 an engineering judgment, a technical judgment.

6 Q For example, if you have a problem with a  
7 PORV, it is my understanding that virtually every  
8 pressurized water reactor has a PORV, is that correct?

9 A Yes.

10 Q At least the newer ones?

11 A Yes.

12 Q So if there are problems with the PORV and  
13 it involves anything relating to safety, does that  
14 automatically make it a generic safety concern?

15 A No, there has to be a threshold of level. In the  
16 truer sense, anything, as you described, anything that  
17 happens at PORV is potentially generic to all plants, but  
18 to become a generic concern it has to be above a certain  
19 threshold in terms of how significant this particular  
20 failure or malfunction is in relation to the operation  
21 of the other plants.

22 Q I see. And again, that's a judgment  
23 question?

24 A That's a judgment question.

25 Q Is the initial judgment on that made by the

1  
2 inspector who finds the problem?

3 A Frequently it is. It can also be made by my  
4 staff on reviewing the daily report or in discussion  
5 with the inspector of the item at the time it occurred,  
6 or it could be picked up by my staff who reviewed these  
7 things, so anyone along the line can label something as  
8 potentially generic.

9 Q Does the I&E function extend to evaluation  
10 of control room layout?

11 A Not per se. If a person had some concern that  
12 the control room layout was sufficient to cause it to  
13 be a safety problem, then we might get involved in it,  
14 but otherwise, we wouldn't.

15 Q And does the I&E function extend to instru-  
16 mentation in the control room?

17 A Again, the review of the design is principally  
18 NRR. The only time we would raise design questions  
19 is when we feel something may have been overlooked in  
20 the design by NRR, or even if approved by NRR, and we  
21 feel it is still wrong, then we would raise that question.

22 Q For example, I made reference before to the  
23 transient that occurred on March 29, 1978 at TMI 2 when  
24 the PORV stuck open, and it is my understanding that  
25 thereafter, the command signal indicator which was

1  
2 mounted on the control board was installed to enable  
3 the operator to have some indication of whether or not  
4 the PORV was opened, or some further indication.

5           Was it an I&E function to evaluate that  
6 problem and to recommend a solution?

7 A       No, it was an I&E function to review the adequacy  
8 of the actions that were taken as a result of this. So  
9 to this extent my previous answer about design review  
10 is deficient. We do review designs when there are  
11 modifications made, so long as the modifications are  
12 within the envelope of the review and approval that  
13 Licensing has previously given.

14       Q       So the design modification to add the  
15 command signal indicator then was subject to review by  
16 I&E?

17 A       Subject to review, yes.

18       Q       And do you know what review was performed  
19 by I&E on that subject?

20 A       I don't personally know.

21       Q       Would that have been through your office?

22 A       It would have been done by the inspector.

23       Q       By the inspector or on the site at that  
24 time?

25 A       Yes.

1

2 Q Do you know who that inspector was?

3 A No, I don't.

4 Q Do you know whether or not any further  
5 safety problem was raised by that inspector in connec-  
6 tion with the use of a command signal indicator?

7 A I don't know.

8 Q Do you know why a command signal indicator  
9 was chosen rather than an actual position indicator?

10 A Because it is easier to do, I suspect.

11 Q Was that the only reason you are aware of  
12 it?

13 A I am speculating. I really don't know why it  
14 was chosen.

15 Q Has any summary of monthly operating  
16 reports or licensee event reports for TMI 2 been prepared  
17 by your office?

18 A We are in the process of preparing a sort of a  
19 history of Three Mile Island. It has not been completed.  
20 This will include the LER's, the items of non-compliance,  
21 the inspection history, these kinds of things.

22 Q Were there many items of non-compliance  
23 extant in connection with Three Mile Island 2, and by  
24 "many," I realize that's a relative term.

25 A As compared to others, they didn't stand out as



1  
2 having a high number. In fact, the people at Region I  
3 rated Three Mile Island as an average or perhaps  
4 slightly better than average plant.

5 Q Based on what you know today, would you  
6 concur in that evaluation?

7 A I am not really in a position to make an evaluation  
8 as to where they sit on the -- in terms of the other  
9 plants.

10 Q Let me see if I can place that in context.  
11 You have had a substantial role in inspection and  
12 enforcement for some time. You have had an impressive  
13 record with the NRC in connection with the reactor  
14 inspections yourself. I am sure you must have some  
15 feel for how good or bad a particular plant can be based  
16 on the LER's that come into your office, and the inspec-  
17 tion and enforcement reports, and all the other docu-  
18 mentation.

19 All I am really asking is, since TMI 2,  
20 March 28, 1979, you have obviously had an opportunity  
21 and the incentive to look into the situation at TMI 2  
22 much more closely.

23 Based on that, do you still feel that TMI 2  
24 had no more significant numbers of problems than most  
25 operating plants in the country?

1  
2 A Well, based on the history, I don't think they  
3 had more in numbers.

4 We have been singularly unsuccessful in being  
5 able to rate licensees. We have made several attempts  
6 to rate them in a better-than-average, average, and  
7 below average, and we find that's an extremely  
8 difficult thing to do, even though there are many  
9 motivations to be able to do it.

10 We find that using one technique for a particular  
11 licensee and another is unique for another group. So  
12 my response is, really, that we haven't been very  
13 successful in rating these things.

14 . To answer what I think your basic thrust is, I  
15 think there are some things at Three Mile Island that  
16 need to be modified and upgraded and corrected, and it  
17 will be before they start operating.

T14 18 Q Sure, but I guess the other thrust of my  
19 question was, based in your experience, do you think  
20 that's likely to be the situation at many other plants  
21 or does TMI 2 kind of stand out as a sore spot?

22 A Well, I don't have any information that would  
23 lead me to think that everything at TMI was bad and  
24 everything was unsafe. It is not true. There were  
25 some things that were -- that have come to light since

1  
2 the accident that need some attention.

3 At any plant, when we identify those things that  
4 have to be taken care of, we pursue those promptly with  
5 that licensee.

6 Q Again, my question was, based on what you  
7 know about TMI 2 today, that is all the history before  
8 March 28, 1979, and everything that's occurred since  
9 March 28, 1979, as well as what did occur on March 28,  
10 1979, does TMI 2 stick out in your mind as a plant in  
11 significantly worse condition in operation and  
12 efficiency and maintenance and safety than other plants  
13 around the country?

14 A I am having difficulty answering the question  
15 that you have asked, because it is --

16 Q Let me put it in context again. We have  
17 already said, and I said in the interview we had with  
18 you, and speaking to a lot of people, up to March 28,  
19 1979, TMI 2 wasn't an example of a bad operation.

20 A That's right.

21 Q As a matter of fact, it was about average,  
22 or perhaps above average?

23 A Yes.

24 Q A little better than some of the others.

25 I am wondering if since March 28, 1979,

1  
2 anything has come to your attention that would change  
3 that estimate on your part?

4 A Well, I think that to answer that, you have to  
5 look into what do we know about the Three Mile Island  
6 accident, and what I know is that there were a combina-  
7 tion of things which both caused the accident and  
8 caused it to be as severe as it was. Some of the  
9 things are not related to Met Ed. Some of the things  
10 are related to the design of the plant, which B&W  
11 provided; some of those things are related to our own  
12 deficiencies as regulators, so I am not ready to point  
13 a finger and say but for this everything would have been  
14 cool at Three Mile Island on the 28th. I'm just not  
15 ready to say that.

16 Q I don't think anyone can.

17 A So I am not likewise ready to say that Met Ed had  
18 the worst plant in the country or that Three Mile Island  
19 was the worst plant in the country. So I can't really  
20 answer the question that I think you have asked me,  
21 because I don't know enough.

22 Q Let me try to rephrase it again. Are you  
23 prepared to say that Met Ed was about average?

24 A They certainly were before. It was everyone's  
25 consensus that they were about average before.

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Q What is the consensus now?

A I don't know that there is a consensus in relation to how Three Mile Island, Met Ed stacks up to the other plants.

Q What is your opinion now, are they still, in your mind, about average, based on what you know?

A Let us say that based on what I know, they are not -- I don't know how to say it.

Q Let me put it this way: Up until March 28, 1979, your opinion was that they were about average, I think you have said that?

A My opinion was based on what other people have told me.

Q Okay.

A For me to get an independent opinion, then I have to look at them personally and look at other people personally, and I don't really look at anybody personally in this.

Q Regardless of what you based it on, up to March 28, 1979, your opinion and the opinion of many other people was that Met Ed was about average?

A Yes.

Q All I am asking is, since March 28, 1979, did you change your mind as to that opinion?



1  
2 A In certain areas I have become knowledgeable of  
3 things that I think that is below average, but to say --

4 Q What things, can you describe what those  
5 things are?

6 A In the health physics area I have, based on some  
7 of the things that we have found during the investiga-  
8 tion, and some of the things that I have heard of since  
9 the investigation, that I think they are not as good as  
10 they ought to be and as good as other plans are in the  
11 health physics area.

12 There have been little, if any, operational  
13 evaluations to make on Three Mile Island since the  
14 accident, because they have been doing things that are  
15 totally unrelated to operation, so I really don't have  
16 any data on which to base the operations aspect of this.

17 Q So as far as you know, as far as the infor-  
18 mation you have, except for the one instance you  
19 mentioned, health physics, they are still about average?

20 A I guess I will have to back into that by saying  
21 I don't know anything right now to significantly change  
22 whatever assessments were made earlier from an operation  
23 standpoint.

24 MR. KANE: Okay. That's all the questions  
25 I have.

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MR. CHOPKO: I have no questions.

MR. KANE: Let me just say, Mr. Moseley, that although I have exhausted the questions I have for you at this time, this is an ongoing investigation, and as a result, it may be necessary to bring you back for a further deposition at some point in the future. We will certainly endeavor to avoid that, but given the ongoing status of the investigation, it may be necessary. For that reason, I would like to just adjourn the deposition rather than terminate the deposition, and let me ask you once again if you could please follow-up on that letter I previously asked you about relating to the Oconee 3. We would very much like to know what documentation was engendered in response to that letter.

THE WITNESS: There were a number of things you asked about, and I have my staff working on it, and we will get it to you as soon as we can.

MR. KANE: I appreciate that. Thank you for your time, sir.

(The deposition was adjourned at 1:30 p.m.)

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 1979.

\_\_\_\_\_  
NORMAN C. MOSELEY

\_\_\_\_\_  
Notary Public

I N D E X

<u>WITNESS</u>	<u>DIRECT</u>
Norman C. Moseley	3

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