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PRESIDENT'S COMMISSION ON THE  
ACCIDENT AT THREE MILE ISLAND

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DEPOSITION of BABCOCK & WILCOX by  
JOHN H. MacMILLAN, held at the offices of Babcock  
& Wilcox, Old Forest Road, Lynchburg, Virginia  
24505, on the 5th day of July 1979, commencing at  
1:30 p.m., before Irwin H. Benjamin, Certified  
Shorthand Reporter and Notary Public of the State  
of New York.

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FOR BABCOCK & WILCOX:

MORGAN, LEWIS & BOCKIUS, ESQS.  
Attorneys for Babcock & Wilcox  
1800 M Street, N.W.  
Washington, D.C. 20038

BY: GEORGE L. EDGAR, ESQ.  
of Counsel

FOR THE COMMISSION:

WINTHROP A. ROCKWELL, ESQ.  
Associate Chief Counsel

ALSO PRESENT:

RONALD M. EYTCHISON  
CLAUDIA A. VELLETRI

oOo

J O H N        H.        M a c M I L L A N ,    having been  
first duly sworn by Mr. Rockwell, took the stand  
and testified as follows:

MR. ROCKWELL:    Mark this, please.

(Resume of John H. MacMillan, dated  
July 3, 1979, was marked MacMillan Deposition  
Exhibit 63 for identification, this date.)

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MacMillan

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DIRECT EXAMINATION

BY MR. ROCKWELL:

Q State your full name, please.

A My name is John H. MacMillan.

Q And your current business address, please?

A Babcock & Wilcox Company, Post Office Box 1260,  
Lynchburg, Virginia, Zip Code 24505.

Q Would you state your current employer?

A The Babcock & Wilcox Company.

Q And your current position with the Babcock  
& Wilcox Company?

A I am vice-president of the Nuclear Power  
Generation Division.

Q Mr. MacMillan, have you prepared and  
brought with you today a resume which we have marked  
as MacMillan Deposition Exhibit 63?

A Yes. I have such a resume prepared.

Q Have you had a chance to review it?

A Not yet. Just let me take a minute.

Q Sure.

A Yes.

Q Does it appear to you to be accurate and  
complete and up-to-date?

A Yes.

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Q Mr. MacMillan, is it accurate to state that the design of a pressurizer surge line and reactor vessel is central to the B&W scope of supply in an NSSS system?

A I would like to know what you mean by the word "central."

Q Is it within the scope of supply?

A The design of the reactor vessel and the pressure surge line are both within the scope of supply of the Nuclear Steam Supply System.

Q Is the design of a pressurizer, as well?

A Yes, sir.

Q And would it be fair to say that the design of all those components originates with Babcock & Wilcox?

A The design of those three components all originate with Babcock & Wilcox.

Q And would it be fair to say that the design of those three components represents B&W's engineering thinking?

A Yes, I think that's -- as it applies to those specific components.

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Q That's what I am referring to, those three specific components.



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A Yes.

Q With respect to those three components, would it be fair to say that Babcock & Wilcox is an expert on the theoretical basis for the design?

A Yes, I think that's fair.

Q Would it also be fair to say that Babcock & Wilcox is an expert on the implications of that design in operation?

A I am not sure I understand, again, what you mean by "implications." Could you clarify that.

Q Would it be fair to say that Babcock & Wilcox is an expert on how that design functions in the field, as a practical matter?

A I think it would be fair to say that B&W would be an expert in the design of those components and the operational considerations that are a factor in the design of those components.

Q And the operational considerations would include how that design would react under various field conditions, is that correct?

A Under various postulated and actual field conditions, I think that's correct, yes.

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Q And Babcock & Wilcox would also be an expert, would it not, with respect to how that design should be used in an operating nuclear plant?

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3 A Should be used, yes.

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Q I take it Babcock & Wilcox would also  
5 be an expert with respect to how that design should  
6 not be used in the field?

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A I am not sure I can answer that. I would have  
8 to say in design equipment of this sort, the design  
9 considers the requirements of that equipment and how  
10 that equipment should be operated.

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Q Okay. And if it involves the understanding  
11 of how that equipment should be operated, presumably  
12 it also involves an understanding of how that equipment  
13 should not be operated.

14

A I don't think you can necessarily draw that  
15 conclusion.

16

There are clearly some things which could be  
17 specified as precluded from operation, but I am not  
18 sure that would be all-inclusive in the sense that a  
19 designer sits down and tries to figure out all the  
20 things which should not be done with the equipment.

20

The designer sits down and tries to lay out a  
21 design and equipment in a way in which that equipment  
22 should be operated and provides recommendations on that.

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Q Putting aside for the moment the question  
24 of whether B&W sits down to figure out all the ways  
25 in which the equipment should not be used, if a

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specific example of the use of the equipment were given to B&W, I assume, is it correct to say that B&W could determine whether that is a correct or incorrect use of the equipment?

A B&W could determine whether that event or that sequence of events as they actually transpired would have caused damage to the equipment.

Q Or would be an inappropriate use of the equipment with respect to its impact on other elements of the system?

A Could certainly determine the impact of that equipment on other elements of the equipment and could determine whether that had a negative influence or a harmful influence on the other equipment.

Q Would you agree, taking as a reference point a particular nuclear power plant, that the other manufacturers and suppliers and participants in that whole process of designing, constructing and operating particular nuclear power systems, a particular plant, would look to Babcock & Wilcox as the ultimate source of expertise with respect to the use of and the design of the three components that I have identified, the surge line, the pressurizer and the reactor vessel?

A I think that's a fair statement, yes.

MR. EDGAR: A clarification. With respect

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to use, do you mean operation?

MR. ROCKWELL: That's correct.

A You are asking me for my perception?

Q That's correct.

A Whether or not I would perceive that the other participants in a broad nuclear project would look to Babcock & Wilcox as the expert on those three components?

Q That's correct.

A And it is my perception that they would.

MR. EDGAR: And you said both operation and design of those three components?

MR. ROCKWELL: That's correct.

Q Is it possible, Mr. MacMillan, for you to identify a central safety concern for the designer and supplier of an NSSS system?

A I would like a little elaboration on that, if you could.

Q Is there a central safety concern that you can identify which would be paramount in the minds of the designer and supplier of an NSSS system?

A I could answer that in the broadest sense, that in the design of a nuclear plant and in the design of a nuclear steam system, the ultimate safety concern is the protection and health and safety of the

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3 general public.

4 Q Would it also be fair to say that a central  
5 safety concern is the protection of the core to see that  
6 it is adequately cooled?

7 A I think that is one of several segments of the  
8 design, which is in fact intended to protect the public,  
9 yes.

10 Q And it is an important aspect of the safety  
11 concern of the NSSS supplier, is it not?

12 A I think that's a fair statement, yes.

13 Q As a practical matter, Mr. MacMillan, in  
14 whose hands does the implementation of the concern for  
15 maintaining the reactor core in an appropriately cooled  
16 state rest ultimately?

17 A Are you asking me for an individual, for an or-  
18 ganization, for -- what is the thrust of your question?

19 Q An organization first, and then an  
20 individual.

21 A First of all, let me say that that responsibility  
22 is the responsibility within Babcock & Wilcox of the  
23 Nuclear Power Generation Division.

24 Within the division, we have always treated  
25 safety as an integral part of the design. We don't  
try to segregate safety from the design. So you  
would have one group of people looking at the design  
and another group of people looking at safety.

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Within the Nuclear Power Generation Division,  
the design work and therefore the concern for safety  
is the responsibility of the Engineering Department.

And within the Engineering Department, there is  
an organization entitled Plant Design, which I think  
most people would think of in terms of systems engi-  
neering; they design the overall nuclear steam system  
and set certain parameters for the nuclear steam system  
such as operating pressure, temperature, flow, and  
they did the analysis work of how the system would  
perform in various postulated accident conditions.

(Continued on Page 11.)

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Q Once a nuclear steam supply system is installed and operating on a day-to-day basis, whose responsibility is it to ensure the safe operation of that system on a day-to-day basis?

A The utility.

Q And specifically, within the utility on whose individual shoulders does that responsibility rest?

A That is the license responsibility of the reactor operators.

Q And Mr. MacMillan, where would the reactor operators get the information that they need to operate the plant effectively so as to implement the safety concern with respect to maintaining the core in an appropriately cooled position?

A There are a number of sources that the operators have through which they avail themselves of that information.

Q And in your judgment, what are those sources?

A First of all, I think you have to look at the operator's broad experience and what experience he has in his own personal resume before he approaches the challenge of operating the nuclear plant or applying for and trying to qualify for a reactor operator's license. His own personal history and experience.

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Secondly, for each nuclear plant there is a training program which is developed by the utility, reviewed with the Regulatory Commission for the training of operators to qualify them to and ultimately get them licensed by the NRC to run the plant.

Those training programs vary in terms somewhat in the content, and they vary broadly depending upon who provides what portions of that training.

Speaking specifically about the Three Mile Island 2 operators, there was a training program developed for them, and in the course of that training program, they did spend a period of time in Lynchburg on the simulator, where they were given training in both the normal and emergency operation of the unit.

Q Would it be fair --

A And they got some input from that.

In addition to that, they returned to the site and were involved in the checkout of the equipment during its initial testing, initial operation.

They have operating instructions which guide them and direct them in not only the normal, but the emergency operation of that plant. That's another source of information which they have, which would help them to understand the operations required to provide the adequate core cooling.

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Q You have identified three categories, an

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operator's own experience, his training, and the

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operating instructions which he relies on, is that

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correct?

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A Yes.

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Q Would it be fair to say that with respect

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to the latter two categories, training and operating

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instructions, that one of the prime sources of infor-

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mation and expertise which frames and shapes the

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training and the operating instructions for an operator

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in the actions that that operator would take to protect

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the cooling of the core is Babcock & Wilcox?

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A I don't think I could accept that as being

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totally valid. I think that in the case -- again,

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looking at Three Mile Island 2, in the case of Three

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Mile Island 2, the simulator training which those

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operators receive here, I think was important in

achieving that objective of training them to operate

in a way that would provide adequate core cooling.

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I think in the case of Three Mile Island 2, the

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operating procedures were an important point of infor-

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mation for those operators, both for normal and for

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emergency operations.

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Those procedures were derived after, in a combina-

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tion of B&W and the utility's direct involvement, so I

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don't think I could say that we were the prime source.  
I think we certainly made a significant contribution.

Q Certainly with respect to the understanding  
of the design and the intended operation of the nuclear  
steam supply system as that is translated into specifics  
for the operators, Babcock & Wilcox is an important  
source of expertise?

A I think we are an important source of expertise.

Q And as the designer and conceiver of the  
system, perhaps the most important source of expertise?

A I think I would accept that, yes.

Q Mr. MacMillan, would you agree that the  
safety of a particular design relates not only to how  
it is engineered and conceived, but also to the instruc-  
tions and warnings that are given to those who must  
operate it on a day-to-day basis?

A I think that the -- yes, I believe the safety of  
a system is a function of the design, its construction,  
the way in which it is tested and checked out to  
demonstrate that it has been constructed in conformance  
with its design and specifications and the way in  
which the equipment is operated, and to the extent that  
the operation of the equipment is influenced by the  
instructions that are given, I would say yes, that's  
one of the important aspects of protection of reactor

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safety.

Q Would you agree that the best design used by people who do not understand it, and who do not use it as it is intended can become or can be misused or can become harmful if it is misused?

A I don't know what the best design is. What is the point you are trying to make?

Q Let me restate the question.

Would you agree that no matter how good a design is, even if it is the absolute best design that is available, by whatever standard you want to use, that if it is used by people who do not understand how to put that design to use on a practical day-to-day basis that it can fail of its purpose?

(Continued on following page.)

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THE WITNESS: May I talk with counsel?

(Witness conferred with counsel.)

A Let me answer the question this way. I believe any design, even if it is, as you have put it, the best design, any design can be abused by inappropriate or ignorant -- which is what I think you called it -- operation.

Q Mr. MacMillan, when did Babcock & Wilcox first understand or appreciate that void formation could occur in the core of a reactor vessel under certain conditions?

A I have no idea. That is much too broad a question to answer specifically.

Q Do you know when Babcock & Wilcox first understood that void formation in the core could hold up the level of water in the pressurizer, so that the level of the water in the pressurizer was not a true indication of the conditions in the core, specifically the water inventory in the core?

A I don't know when that was first recognized by Babcock & Wilcox.

Q Mr. MacMillan, when did Babcock & Wilcox first become aware of the Davis-Besse transient which occurred on September 24, 1977?

A I don't know specifically when we became aware

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of that. I do know that shortly after that occurred, we were contacted by Davis-Besse and that we did evaluate that occurrence. We made some recommendations on equipment modification, reviewed the effect of the transient on the equipment to assure that it had not been damaged, so as to preclude continued operation, and that would have been in the matter of a very few days after the incident; I don't know specifically when.

Q When did you personally first become aware of the September 24, 1977 Davis-Besse transient?

A I can't answer that in specifics, either, except to say that following that transient, as I indicated, we did review the source of the problem, a pilot-operated relief valve. We did have an investigation of what the problem was and recommended some modifications in the circuitry or recommended that circuitry be made to correspond to the drawings as originally recommended.

On subsequent testing of that valve, we made some modifications of the valve itself and reviewed the reactor system component. It was toward the end of that evaluation that I first became aware of what action had taken place -- excuse me -- what events had taken place and what action B&W had taken

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in the wake of that incident.

Q Would it be fair to say that you probably became aware of that transient in a matter of weeks or at most a couple of months after it occurred?

A I would expect it would have been in October 1977, in approximately that time frame. I don't know precisely.

Q Do you have an understanding of the key events involved in that September 1977 Davis-Besse transient?

A I have an understanding of the general events. I don't know that I could be detailed.

Q Would you agree that one of those events was a fail open PORV?

A Yes.

Q Would you agree that one of those events in that transient was a temporary loss of feed, all feed?

A I can't verify that. I don't know.

Q Would you agree that one of those events was a termination of HPI?

A I can't confirm that, either.

Q Would you know whether one of those events, to elaborate on the last point, was viewed as a premature termination of HPI?

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A I couldn't confirm that either.

Q Would you know whether those events included premature termination of HPI, based upon a pressurizer level that was higher than one would normally expect, in relation to the water inventory in the core?

A I can't confirm that.

Q Following the Davis-Besse transient of September 24, 1977, was a concern expressed within the Nuclear Power Generation Division of B&W that incorrect operator action might occur again in the future, based on the unusual high level in the pressurizer, as that level related to the water inventory in the core?

A Well, let me address that in two steps.

At the time that I mentioned earlier when I was made aware of the Davis-Besse incident in late 1977, to my knowledge at that time, there was not that concern expressed.

Q Did you ever become aware of a concern expressed along those lines?

A Yes, I became aware of that concern in April 1979, following the Three Mile Island 2 incident.

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Q Mr. MacMillan, referring you to what has previously been marked as Womack Deposition Exhibit 24, did you ever see that document before March 28, 1979?

A I don't believe I have seen this document.

Q At all?

A I don't believe so.

Q Today is the first time you have seen that document?

A To the best of my recollection.

Q Referring you to what has previously been marked as Dunn Deposition Exhibit 35, have you ever seen that document before March 28, 1979?

A I don't believe I have seen that either.

Q Have you seen that before today?

A No, not to the best of my knowledge, no.

Q I understand. Obviously all questions are directed to the best of your knowledge.

A My recollection is I don't remember seeing that.

Q Mr. MacMillan, referring you to what previously has been marked as Womack Deposition Exhibit 23, have you ever seen that document before March 28, 1979?

A You asked if I have seen this before March 28, 1979?

Q Yes.

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A No.

Q Have you seen it since?

A Yes.

Q Who brought it to your attention?

A I believe this was brought to my attention by Allen Womack, but that is a vague recollection.

Q Do you recall the circumstances under which it was brought to your attention?

A I believe it was brought to my attention at the time that we were preparing or I was preparing to testify before the Advisory Committee on reactor safeguards.

Q Have you had a chance to read that document before today, Mr. MacMillan?

A I read this document in April 1979, yes.

Q Referring to the substance of the document, as opposed to the document itself, had you ever become aware of the concerns or issues raised in the document before March 28, 1979?

A I was not.

Q Referring you to what has previously been marked as Dunn Deposition Exhibit 36, had you ever seen that document before March 28, 1979?

A I believe I saw it at the same time that I saw that Exhibit --

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Q 23?

A Exhibit 23, yes.

Q Did you have a chance to read both of these documents in April of 1979?

A Yes.

Q Did you feel at that time that you needed to talk to anyone to understand more fully what the issues were that were being addressed in those documents?

A I did have further discussions on these issues, yes.

Q With whom?

A I discussed the issue with Don Roy. I discussed the issue with Allen Womack. I believe those are the principals in that discussion.

Q What was the substance of the discussion that you had with Mr. Roy and with Mr. Womack?

A My question to them was, "What actions were taken as a result of these memos".

Q What were you told?

A I was told that this issue had been referred to the Service Department, and that subsequently the Service Department had raised some additional questions relative to the concern about the general issue of going solid in a reactor coolant system.

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Q And were you told whether and how these issues of concern were resolved?

A I was not.

Q Did you inquire as to how those issues were resolved?

A Yes.

Q And what answer did you get?

A The answer I got was that those issues had not been resolved.

Q Did you inquire of whether the issues raised in the Exhibit you have before you, Exhibit 36, and the issues raised in Exhibit 23 had been communicated to your utilities before April 28, 1979 -- correction -- March 28, 1979?

A I asked the question and I was told it had not.

Q Referring you now to what has been previously marked as Dunn Deposition Exhibit 41, have you seen that document before March 28, 1979?

A Excuse me. Would you repeat the question?

Q Have you seen that document before March 28, 1979?

A No.

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Q Have you seen it since that time and before today?

A Yes, I have seen this in the period since March 28, 1979.

Q When did you see it?

A I believe this also was brought to my attention at the time that we were preparing for testimony to the Advisory Committee on reactor safeguards, which would have been in April of '79.

Q Do you recall who brought it to your attention?

A I believe this particular document was brought to my attention by Ron Nelson, our -- by Ron Nelson.

Q Referring you to what has previously been marked as Dunn Deposition Exhibit 40, had you seen that document before March 28, 1979?

A No, I have not seen this.

Q Have you seen it before today?

A No.

Q Referring you to what has previously been marked as Dunn Deposition Exhibit 37, have you seen that document before March 28, 1979?

A Yes. Before March 28?

Q Yes.

A No.

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Q Have you seen it since then?

A Yes, I have seen it since then.

Q Who brought it to your attention?

A This was one of the documents which Mr. Womack brought to my attention at the same time he showed me the earlier-referenced document, Exhibit 23.

Q Referring you to what has been marked as Dunn Deposition Exhibit 38, have you seen that document before March 28, 1979?

A No.

Q Have you seen it before today?

A No.

Q To your knowledge was Met Edison ever notified of the concerns raised in any of the documents which we have just reviewed?

A Not to my knowledge.

Q Mr. MacMillan, would it be fair to say that the Dunn memorandum which you have seen, Exhibit 23, and which you reviewed in April essentially bogged down in the Nuclear Power Generating Division organization between the time it was written in February of 1978 and March 28, 1979?

A Well, I don't know what you mean by "bogged down." I think it is clear from the record of the correspondence that the issue was brought to Mr. Taylor's

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attention. There were subsequent discussions about what would represent appropriate instructions for operators. These instructions were challenged by people in the service organization.

The conflict between the persons involved was not resolved, and to that extent it remained an open or unresolved issue. If that is what you mean by "bogged down," I would accept that.

Q And it also remained an issue which was not communicated beyond the bounds of the Nuclear Power Generating Division, is that correct?

A To the best of my knowledge.

Q To the best of your knowledge it is correct?

A To the best of my knowledge that is correct.

Q Have you conducted an investigation --

A Let me qualify that. Before March 28, 1979?

Q That is correct.

A Yes.

Q Have you conducted an investigation, Mr. MacMillan, or has an investigation been conducted at your behest as to why the information and concerns raised in the Dunn memorandum, which we marked as Deposition Exhibit 23, and the related letters and memoranda which we have just reviewed, were not communicated to your operating utilities before

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March 28, 1979?

A I have not instigated nor conducted what may be characterized as an investigation. I did ask a series of questions at the time that these letters were shown to me to try to understand what actions had been taken or what actions had not been taken and satisfied myself that there was an unresolved difference of opinion. I have not pursued it beyond that since March 28th, being pretty well consumed with other activities in the interim period.

(Continued on following page.)

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Q So that extent, the extent you have

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described, you made an inquiry?

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A I made an inquiry, yes.

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Q Did you ever speak with Mr. Taylor about

7

the question of how that memorandum that you have

8

before you, Exhibit 23, was handled?

9

A I don't believe I have.

10

Q Have you analyzed the Dunn memorandum

for its significance in relation to the TMI 2 events?

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MR. EDGAR: Read back the question.

12

(Last pending question read.)

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A Well, I ought to answer that by saying I haven't

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conducted what I would consider anything as could

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be dignified by the word "analysis" of the Dunn

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memorandum. I read the Dunn memorandum, as I said,

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for preparation for the ACRS testimony, and certainly

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was struck in the process of reading that by the

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concern that was raised on this issue relative to

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premature interruption of high-pressure injection flow,

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which I have testified I felt to be the most important

event in the TMI 2 sequence.

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Q Would it be fair to say that you have at

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least reviewed the Dunn memorandum in connection with

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the TMI 2 events?

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A I think that is fair to say.

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Q I would like Mr. MacMillan to identify the public statements that you have made since the TMI 2 accident.

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Am I correct that you wrote a letter on May 21, 1979 to Mr. Weaver, who is associated with one of the committees in Congress investigating the TMI 2 accident?

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A Mr. Weaver did ask certain questions following our testimony before his subcommittee. A response to those questions was drafted and was forwarded to him. I can't confirm the date specifically. It would have been in May.

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(Document described below herein marked MacMillan Deposition Exhibit 64 for identification, this date.)

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Q Showing you what has been marked as MacMillan Deposition Exhibit 64, which is a letter you wrote to Mr. Weaver dated May 21, 1979, right?

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Q Did you also prepare an oral statement to the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs, dated May 24, 1979, to the best of your recollection?

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A To the best of my recollection, we did prepare a statement that was entered into the record of the

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proceedings at those hearings.

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(Document described below herein marked  
as MacMillan Deposition Exhibit 65 for identi-  
fication, this date.)

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Q Mr. MacMillan, showing you what we have  
marked as MacMillan Deposition Exhibit 65, is that  
a copy of the prepared oral testimony which you pre-  
sented on the date indicated on the cover of the  
exhibit, which I believe is May 24, 1979?

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A Yes, May 24.

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Q For the record, I would advise you that  
that is a copy that I have made some marks on, and I  
do not have a clean copy. I will substitute a clean  
copy, with Mr. Edgar's consent, following this  
deposition.

17

A Your question is, is this my statement?

18

Q Yes, your oral statement.

19

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A Yes, this was the statement that was prepared  
for the Subcommittee on Energy and the Environment.

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(Document described below herein marked  
MacMillan Deposition Exhibit 66 for identifica-  
tion, this date.)

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Q Showing you what has been marked as  
MacMillan Deposition Exhibit 66, is that a copy of

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the statement of the Babcock & Wilcox Company before the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs, dated May 24, 1979?

A Yes.

(Document described below herein marked MacMillan Deposition Exhibit 67 for identification, this date.)

Q Showing you what has been marked as MacMillan Deposition Exhibit 67, does that appear to be a transcript of testimony given by you before the United States House of Representatives, the Committee on Interior and Insular Affairs, Subcommittee on Energy and the Environment on May 24, 1979, and, Mr. MacMillan, because of the time restrictions which we are under, I would ask you to review it generally. I would be very happy to make it available to you after the deposition to verify that it is in fact complete, but tell me generally whether that appears to be a transcript of your testimony on that date before that committee.

A Just glancing through it, it does appear to be, yes.

Q If you wish to review it later, I would be happy to have you do that.

A Thank you.

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(Document described below herein marked  
MacMillan Deposition Exhibit 68 for identifi-  
cation, this date.)

Q Let me advise you that it is a transcript  
that we have had made of the press conference held  
here in Lynchburg, Virginia at the Nuclear Power  
Generation Division on I believe it was June 5, 1979,  
and let me further advise you that the transcript was  
made from tapes provided to us by your office, and  
again let me ask you if you would look at it generally  
to see if it appears to be a transcript of a press  
conference which was held here at the Nuclear Power  
Generating Division on June 5, and let me also state  
for the record that I know you have not had a chance to  
review that, and we hereby offer that if you wish to  
review the transcript to see that it is accurate, we  
would be most happy for you to do that and to offer  
any corrections which you may have to the transcription.  
Obviously we are not talking about changes in substance,  
but questions relating to accuracy of the transcription.

A Yes, we ought to do that.

It appears to be, just from glancing through  
it, the same material that was covered in the press  
conference.

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Q In addition to the five Exhibits which we have now marked and which are all before you, have you made any other statements publicly since the TMI 2 accident on March 28, 1979?

A Yes.

Q Could you tell me what those are.

A I made a statement to the Advisory Committee on Reactor Safeguards.

Q Could you tell me the date.

A I ought to check that, but I believe it was April 26, 1979.

Q Do you have a copy of either your prepared testimony or a transcript of your actual testimony or both?

A We have a copy of the prepared statement.

MR. ROCKWELL: Could we have a copy of it.

MR. EDGAR: You were already given it, but we could provide another.

Off the record.

(Discussion held off the record.)

Q In addition to the five Exhibits which are marked and which are before you, and in addition to the April 26, 1979 statement which you made to the ACRS, have you made any other public statements since March 28, 1979 in reference to the events at TMI 2?

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A Yes, I made a statement before Senator Hart's committee.

Q Do you recall the date of that statement?

A I don't recall the date of that; I have to check that. We did have a prepared statement for that committee hearing.

MR. EDGAR: For the record, that is Senator Hart's subcommittee.

A It is a subcommittee on nuclear regulation.

MR. ROCKWELL: I do not believe we have a copy of that.

MR. EDGAR: You do not?

MR. ROCKWELL: Off the record.

(Discussion held off the record.)

MR. ROCKWELL: If we do not have a copy, could we have one?

MR. EDGAR: Yes.

Q In addition to what we have already identified, were there any other public statements made since the TMI 2 accident?

A Yes, I testified before Representative McCormick's committee in the House of Representatives, and I will have to check specifically the date of that committee meeting, and I don't know the formal title of the committee. I can get that for you also. We did have



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a prepared statement which we submitted to that committee also.

MR. ROCKWELL: Once again, I am not familiar with having seen a copy of that. I will check, and if we do not have it, may we have one from you.

MR. EDGAR: Yes.

Q Are there any other public statements which you have made since the TMI 2 accident?

A Yes, I made a statement before the Nuclear Regulatory Commission. Again, I will have to get you the specific date. It was in conjunction with the question of the continued operation of other nuclear units incorporating nuclear steam system designed by Babcock & Wilcox. There was no prepared statement for that meeting.

Q Have you received a transcript of your remarks?

A I have not.

Q Are there any other public statements?

A Could I go off the record a second.

Q Yes.

(Discussion held off the record.)

Q With respect to the testimony which you indicated you gave before a closed session of the

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Weaver Task Force, did you have a prepared statement,  
4 or have you received transcript?

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A Let me ask a question off the record.

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Q Off the record.

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(Discussion held off the record.)

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A At the closed session of the Weaver Task Force,  
I made a verbal presentation describing the events  
9 that took place and our assessment of the significance  
10 of those events. I don't recall whether we had a  
11 formal statement drafted for that or not. I will have  
12 to check it.

13

Q If you had a formal statement, or if you  
used slides or illustrative material, could we have  
14 a copy of that?

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MR. EDGAR: Yes.

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Q Are there any other public statements that  
you have made, Mr. MacMillan, other than the ones we  
18 have already covered?

19

A On June 6, we had a meeting of the security  
20 analysts here in Lynchburg, and we covered the same  
21 material in the form of presentations that we presented  
22 to the press conference the day before on June 5 which  
you have had transcribed in your Exhibit 68.

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Q Were there written materials for the  
June 6 meeting other than those reflected in the press

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kit which was given to the press conference on the  
previous day?

A I don't believe so.

Q Are there any other public statements that  
you have made?

A I believe those are all of the public statements  
I have made.

Q Mr. MacMillan, I realize that there are a  
fair number of these, and I would ask if, after the  
deposition, any additional ones come to mind that you  
notify us through Mr. Edgar. Would that be agreeable?

A Okay.

MR. EDGAR: We will do that.

(Continued on following page.)

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Q Would you describe to me, Mr. MacMillan, the manner in which you prepared yourself for some 10 or 12 public statements which you have made with reference to the TMI 2 accident since the accident.

A Well, that is a broad question.

Clearly, I was personally involved in the events that took place immediately following the Three Mile Island incident, and in fact, spent five or six weeks at the site in support of the utility and the recovery operations.

In drafting the special material that was presented, I had members of my staff prepare that information which I reviewed and commented on and made modifications on before it was prepared in the final form and presented to the various bodies which we have discussed.

Q During the preparation process for any or all of these public statements that you have mentioned, did you request memoranda or working papers other than drafts of your public statements from any members of your staff?

MR. EDGAR: Other than counsel?

MR. ROCKWELL: That is correct.

A Other than counsel, I don't believe I did. We

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were dealing with draft material for the presentations.

Q My understanding is correct, then, that there were no background working papers or background information papers which were developed as resource material for the drafting of your public statements other than actual drafts of your public statements?

A I believe that is correct.

Q Did you have briefings from members of your staff, oral briefings?

A Yes.

Q Was there a pattern of having a briefing generally before each of your public appearances, for you to be updated on information?

A Yes.

Q Was one of the functions of those oral briefings essentially to block out what you intended to say and how you intended to present it?

A That was one of the purposes.

Q Was there a working group which you gathered for these briefing sessions whose members continued from one briefing session to another?

A Some of the members participated in -- like I say, some of the members participated in all of these sessions, and others did not.

1892 125

Q Can you tell me which members participated in all of these sessions?

A I relied primarily upon Harry Allen of our Marketing Department and Byron Nelson to prepare the draft material for the various presentations, and they, I believe, were involved in all of the briefings and prepared materials.

Q Were there others who were involved in all of the briefing sessions?

A I don't know of any others who I can definitely say were involved in all of them.

Q Were there others who were involved in more than one?

A Yes.

Q Can you tell me who they were?

A Don Roy was involved in more than one; Dick Kosiba, Jim Deddens, Nelson Embrey, and I believe Norm Elliott was involved in at least one or perhaps two; Jim Taylor, and I had other legal counsel involved, including Mr. Edgar. Those are the names that occur to me as most frequently involved.

Q When was the decision made to call the June 5 press conference?

A That decision was made in Mr. Ziff's office in

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New Orleans, I believe, earlier in May, but I can get a specific date on that.

Q Were you a participant in that decision?

A Yes.

Q Who else was a participant?

A Mr. Ziff, Mr. Fabrett, Mr. Vannoy.

Q Were there any others?

A I believe Mr. Miracle was also in that meeting.

Q Anyone else?

A And Mr. Dupy.

Q Any others?

A Those are the only ones that I recall.

Q What was the reason for calling the press conference?

A We had made a decision immediately following the Three Mile Island incident not to discuss the incident or our response to it in the public press, feeling it was our responsibility to support the utility, and that any statements that were made should be made by the utility.

Subsequently, the NRC requested that they be the primary source of public statements. We concurred with that request.

We had received substantial pressure from the

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media to indicate to them our assessment of the incident and what we had done in response to it, and therefore, we felt compelled at the appropriate time to make a public statement and to respond to those questions that they might have as to what our involvement was in the Three Mile Island incident, and we felt that it was two months after the incident, and as we had a chance to evaluate the situation, it was appropriate to proceed with that public briefing.

Q WERE there any other factors in calling the press conference that were taken into account?

A Well, any time that you make a decision to have a press briefing, you clearly discuss the implications of that as it might apply to the company's perceived response to a situation or the company's financial involvement or the potential for the perception on the part of the general public or stockholders of the actions which were taken by the company, and those issues were also a factor in discussing whether to have a press conference or not.

Q Was there a sense among those who made the decision to call the press conference or participate in the decision that it was time for Babcock & Wilcox to stand up and say its piece?

A Well, I don't know that I'd put it in those

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2 terms. There were people who felt that it was important  
3 for us to make a public statement and to give the  
4 press and the media the opportunity to ask questions  
5 which they might have, and to put that statement  
6 in a way that we felt reflected the facts in the  
7 case, and indicate the actions which we had taken  
8 which we felt were quite responsible in response to  
9 that, so there are some who would say it is time to  
10 make a public statement and to give the press an  
11 opportunity to ask the questions that they might have.

11 Q Was there any discussion in that meeting  
12 that the press conference should be designed so that  
13 Babcock & Wilcox could take a public posture that it  
14 did not feel that it was intimately involved with the  
15 responsibility for the events at TMI 2?

16 A I wouldn't want to answer that question directly,  
17 but let me state it differently.

18 One of the considerations that was discussed at  
19 the time of the decision to have a press conference  
20 or not was a matter of the kinds of questions which  
21 might be raised by the press in such a briefing, and  
22 one of the questions which was anticipated that the  
23 press would ask was who was to blame, and we did  
24 discuss what our response would be to that question.

24 (Continued on Page 44.)

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3 Q What was the discussion with respect to  
4 the response to that hypothetical question?

5 A We discussed the appropriate answer to that  
6 question, and concluded that our answer to that ques-  
7 tion should be, if it was asked, that we did not feel  
8 that we had a blame in the Three Mile Island incident.

9 Q Was there one person on your staff who was  
10 charged with the preparations for the press confer-  
11 ence, or generally charged?

12 A The arrangements for the press conference here  
13 in Lynchburg, as it applied to transportation, setting  
14 up the room, getting the hotel reservations for those  
15 who needed it, those types of arrangements were  
16 handled by Duval Holt, who was our public relations  
17 representative here in Lynchburg.

18 Q I take it that substantial effort was made  
19 in the arrangements for the press conference?

20 A Yes, sir.

21 Q I take it materials were specially printed  
22 for the press conference?

23 A Yes.

24 Q Did Babcock & Wilcox offer to pay the  
25 airplane fares of the press to come to Lynchburg for  
that press conference?

A I don't know what arrangements were made in terms

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of transportation, since I was not involved in that

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aspect of the press conference.

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Q Going into the press conference, did

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Mr. Ziff know of the Dunn memorandum?

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A I don't know.

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Q Did you ever tell him about it before the

press conference?

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A I don't believe I did.

10

Q Going into the press conference, did

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Mr. Fabrett know about the Dunn memorandum?

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A I remember discussing the Dunn memorandum with

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Mr. Fabrett; I can't tell you whether it was before or

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after the press conference. I don't remember the

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timing involved.

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Q Before the press conference, was there any

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discussion between you and anyone with respect to how

to handle the Dunn memorandum?

18

A Could you be more specific. I am not sure I

19

understand what you are asking.

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Q Was there any discussion between you and

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anyone with respect to how to handle questions that

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might approach the substance of the Dunn memorandum or

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whether or not to disclose the Dunn memorandum at the

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press conference?

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A There was no discussion relative to the Dunn

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memorandum as it applied to the press conference, nor a speculation as to whether or not a question of that type might be asked.

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Q I take it there was no discussion of disclosing the Dunn memorandum at the press conference?

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A Not to my knowledge.

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Q Referring you now to MacMillan Deposition Exhibit No. 68 which you have before you, Page 4, Mr. Ziff states on Page 4 that the period between March 28, 1979 and presently, the time of the press conference, and I quote now, "has allowed a careful and thorough analysis of the events which took place, and we would like to discuss these events with you, in detail, today, and let you know the conclusions that we have reached."

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Did you agree with that statement?  
A I think, in general, I agree with that statement, yes.

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Q And you agreed with that part of the statement which indicated that B&W intended to discuss the conclusions that it had reached with respect to the events at Three Mile Island?

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A In general, yes.  
Q Referring you now to Page 23, you identified, did you not, Mr. MacMillan, what you perceived

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to be the significant events in the sequence of events  
of the accident at Three Mile Island, is that correct?

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A That is correct.

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Q You identified as the first significant  
event the auxilliary feed block valves being closed,  
is that correct?

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A That is correct.

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Q As the second significant event you  
identified the PORV as having failed to open, is that  
correct?

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A That is correct.

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Q As the third significant event you identi-  
fied the operator concern about high pressurizer water  
level, is that correct?

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A I think the way I stated that was the sole  
attention to high pressure water, not to pressurizer --  
or the attention to high pressurizer water level alone.

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Q Referring you to Page 25, Line 7, did you  
states, "The third significant event was the operator  
being concerned about the high pressurizer water level"?

19

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A That is what it says, yes.

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Q Did you identify the fourth significant  
event as the cutting back of high pressure injection,  
and further identify it as what you perceived to be  
the most important of the significant events which you

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had identified?

A Yes.

Q Referring you to Page 25, Lines 10 through 17, let me read:

"The fourth significant event, and probably the most important in the whole sequence, was a decision on the basis of that information, to cut back on the high pressure injection pump. He did that at about four minutes in the accident for the first pump, and 10 minutes into the accident on the second pump. And so now, there is no water supply coming into the reactor coolant system."

Does that appear to be, to the best of your recollection as you sit here today, an accurate transcription of your remarks?

A Yes, I believe so.

Q Now, let me read to you from Page 32, Line 7, and I quote:

"The third significant factor was the inappropriate emphasis by the operators on pressurizer level indication only. I mentioned the pressurizer level starting to go up. The operator, as it approached the full level, apparently became concerned about that, and then performed the action which is the fourth significant factor, closely allied with that, the

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premature shutdown or cutback in high pressure injection flow."

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Does that appear, to the best of your recollection as you sit here today, to be an accurate transcription of what you said?

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A I believe so.

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Q Referring you now to Page 33, Line 7, I quote:

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"The operating procedures call for leaving the high pressure injection system in operation unless the operator is able to maintain both an adequate pressurizer water level, and a reactor coolant system pressure above 1,600 pounds per square inch. In this case, as I say, the operator -- he cut back on the high pressure injection flow, despite the satisfaction of those two conditions, and we believe that's the..." and "the" is underlined, "most significant factor in the whole incident.

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"Had he left the emergency pumps on, and let them do the job that they are designed to do, by providing water to the reactor coolant system and keeping the core covered, there would not have been any subsequent core damage nor a substantial corresponding radiation release."

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Does that appear to be an accurate

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transcription of what you said?

A I think that is reasonably accurate. I don't  
remember underlining the "the."

(Continued on following page.)

1892 136



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Q For the record, presumably that was the interpretation of the transcriber, and you are certainly not bound by that. You did know about the Dunn memorandum when you made those statements, did you not?

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A Yes.

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Q You did know that the Dunn memorandum had specifically identified operator error in throttling HPI as a danger, did you not?

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A What was that question?

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Q You did know that the Dunn memorandum had specifically identified operator error in the premature throttling of HPI as a danger or as a source of significant concern?

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A Yes. Mr. Dunn expressed the concern that the operator might, on the basis of pressurizer level, only cut back on HPI.

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Q I take it at this time you also knew that Dunn had identified the problem of premature termination of HPI, based on the focus on pressurizer level as a serious concern?

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A Yes.

Q And you knew that he had identified it as a concern "requiring marked attention and correction"?

A Yes. I believe those are the words that he

1892 137

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3 said in his letter.

4 Q I refer you to the last sentence of the  
5 memorandum.

6 A Yes.

7 Q Did you tell anyone at the press con-  
8 ference about the Dunn memorandum?

9 A I did not.

10 Q You did tell them that your factors No. 3  
11 and No. 4 -- actually your factor No. 4 was the most  
12 significant factor, is that correct?

13 A That is correct.

14 Q And that factor No. 4 was the cutting  
15 back of HPI prematurely, based on focus on pressurizer  
16 level alone, is that correct?

17 A I think I ought to qualify that by saying that  
18 I also mentioned that the cutback prematurely on  
19 high-pressure injection flow was contrary to what I  
20 called operating procedures, emergency procedures  
21 which the operator had in the control room.

22 Q And at the time that you told them that,  
23 you were aware that Dunn, a member of your own  
24 organization, had identified previously, more than  
25 a year previous to the TMI 2 accident, a concern  
26 that operators were not adequately understanding and  
27 were erroneously focusing on water level in the

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pressurizer as a criterion for throttling HPI?

A I am aware that Mr. Dunn raised the concern that operators may, in depending upon pressurizer level alone, prematurely cut back on high pressure injection, but he also indicated in there that a recommendation that high pressure injection only be terminated when the pressure had been restored in the reactor coolant system -- I was aware at the time of the press conference that the emergency procedures for the operation of the Three Mile Island 2 called for continued high-pressure injection until both the level was maintained and pressure was maintained above 1600 pounds, and those conditions were not satisfied at Three Mile Island.

Q But you knew specifically that the prescription by Mr. Dunn, as offered in his memorandum to avoid what he perceived to be the potential for operator error in this kind of situation had never been transmitted to the operating utilities?

A I knew there had been no transmission to the utilities as a result of the first Dunn memo.

Q Did it occur to you, Mr. MacMillan, that your statement with reference to operator error in the premature throttling of HPI based on pressurizer level alone, was misleading in light of your own knowledge of the Dunn memorandum and the contents

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of the Dunn memorandum?

A        Could I hear the question again?

(Previous question was read back.)

A        I believe that the statement that I made at the press conference, and which I have made in other public statements, that the premature cutback of high-pressure injection flow was an inappropriate operator action and probably the most significant action taken by the operators during the sequence at Three Mile Island, with the full knowledge and in some cases explicit statement that that action was contrary to the emergency procedures on which the plant should be operated.

Q        Did it occur to you that that statement might be misleading in light of the fact that your own organization -- at least one member of your own organization -- had specifically identified and raised a concern that the error which had occurred in the September 24, 1977 Davis-Besse accident might be repeated?

A        I believe the statement that I made was a valid statement of the circumstances in the Three Mile Island 2 incident.

1892 140

Q        Did it occur to you that the Dunn memorandum might be relevant to your discussion at

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that point with the press.

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A I can't say that I felt it was that relevant at the time we were preparing the statement for the press and responding to the questions. I believe that what I tried to do there was to state the facts as they evolved and the sequence of events at Three Mile Island and the assessment of those facts as we felt they were important or not. I think that is exactly what I did.

Q Did it occur to you your statements might be viewed in a considerably different light by the public and the press had the public and the press been aware, at the time you made those statements, that a unit manager in your Engineering Department had raised, as he put it, very serious concern or "serious concern" about the potential for precisely the kind of operator error that in fact occurred at TMI 2?

MR. EDGAR: You are asking the same question.  
A Yes.

MR. EDGAR: It is rephrased, and Mr. MacMillan has answered it three times. I would like to note an objection to the continued asking of the same question that has already been answered.

1892 141



Q I would ask Mr. MacMillan to answer the question, and I will proceed.

A May I hear the question again?

(Previous question was read back.)

A Let me try to respond in this way. I think the answer to your question, as I understand it, is it did not occur to me at the time we were preparing the information for the press conference -- it did not enter my deliberations or my considerations as to what the public reaction might be with awareness of the Dunn memo.

I was aware at that time of the Dunn memo and the concerns expressed. I was also aware at that time that those concerns were covered in the emergency procedures which were the basis for the operation of Three Mile Island 2.

To that extent, I felt that I had been forthright in describing the events that had taken place, and the fact that the operators were in appropriate in the actions they took in cutting back high-pressure injection flow, in conflict with the procedures which were in place. Had they followed the procedures, the concern which Mr. Dunn had expressed would not have been a factor.

(Continued on Page 56.)

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Q Was it your reading of the Dunn memorandum that Mr. Dunn was raising the question of whether the operators adequately understood the emergency procedures?

A I don't believe that was ever a factor in Mr. Dunn's letter. He didn't mention the words.

Q Did you understand that the thrust or implicit assumption of the Dunn memorandum was that even though those emergency procedures existed that the operators were unable to follow them or were not following them in the fashion in which they were intended to be followed?

A I think that was implicit in what he said in his letter, based on the observations of the Davis-Besse occurrence.

Q What is your perception of who has responsibility for the content of emergency procedures?

A The responsibility for the preparation of the emergency procedures is the utility's responsibility.

Q Does B&W have any responsibility for the content of those emergency procedures in your view?

A B&W has a responsibility for informing the utility of the basis on which the equipment they have designed and supplied should be operated, certainly as it applies to emergency procedures and applies to the

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equipment that we supply, that we do have a responsibility there.

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Q With respect to the press conference on June 5, 1979, clearly Babcock & Wilcox sought out the press, is that correct?

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A Well, as it applied specifically to the invitation to attend the June 5th press conference, we invited the press to Lynchburg for the press conference, but I must stress that for a period of some eight to 10 weeks prior to that press conference we had repeated inquiries from various members of the media for an opportunity to hear our assessment of the situation and to ask us questions relative to our response to the incident, and we felt that there was an interest in that on the part of the press.

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Q You were not required to hold a press conference, were you?

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A No.

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Q Do you believe that Mr. Ziff's reference on Page 4 to a thorough analysis of the events at TMI 2 included your review of the Dunn memorandum?

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A I stated earlier I don't know whether Mr. Ziff was aware of the Dunn memorandum or not.

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Q In your mind, would a thorough analysis or careful analysis of events at TMI include a review of

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the Dunn memorandum?

A I think it would, and I believe that that was a factor involved in the supplementary operating instructions that were issued shortly after the Three Mile incident.

Q I refer you to Page 40 of the press conference transcript, Line 12:

"On Friday, following the incident -- the incident occurred on Wednesday, and Friday following the incident, we were in contact with our other operating utilities, to try to indicate to them the nature of the problem, and what some of the contributing factors were. We sent out an initial bulletin to the other operating units on Sunday. We met with the representatives of the other utilities on Tuesday, and described for them what had happened at Three Mile Island, to the best of our ability, what the comparison of the design there was to their individual plant design. We sent out other advisory bulletins, recommending modifications or clarifications of operating procedures, we felt were pertinent to the continued safe operation of those units."

Does that appear to be to you a generally accurate transcription?

A I think generally, yes.

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Q Certainly that procedure that you described

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with respect to your response to TMI 2 was not followed

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on the day after the Davis-Besse incident in

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September of 1977, was it?

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A You lost me there.

(Previous question was read back.)

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A The sequence of events described on Page 40 and

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the response we made to Three Mile Island was not

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followed subsequent to the Davis-Besse incident.

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Q If you had followed an advisory and infor-

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mative procedure generally along the lines of the

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material I have quoted from Page 40, would it, in your

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opinion, have made any difference potentially to the

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outcome at TMI 2?

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A That is highly speculative. I don't know how to  
answer it.

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Q Do you have an opinion?

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A I simply don't know. It would depend on what

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the contents of those bulletins were.

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We did evaluate the situation at Davis-Besse,

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determined the cause of the problem of Davis-Besse.

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We took corrective measures at Davis-Besse to modify

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the pilot-operated relief valve. We asked the question,

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is that problem applicable to other units, and the

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answer was no, because the pilot-operated relief valve

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at Davis-Besse was a Crosby valve, and all our other operating units were Dresser valves and, therefore, the judgment was made it was not applicable at other units and, therefore, there was no necessity to issue a bulletin to the other operating units.

Q Was the judgment made that the substance and issues addressed by the Dunn memorandum were not applicable to other utilities?

A I am not aware of the process by which that assessment might have been made. As I indicated earlier, to my knowledge there was a conflict between the technical people in our organization about the type of instructions that should be issued to the other utilities, and that technical difference of opinion remained unresolved prior to March 28, 1979.

Q Directing your attention to Page 45 of the transcript, let me--starting on Line 8, and there are three paragraphs which follow -- try to summarize, if I understand correctly, your perspective on the lessons learned from TMI 2. Let me try to summarize it, and tell me if I do it accurately.

A You understand this is Mr. Fabrett's statement, not mine?

Q Excuse me. Yes, it is. Nonetheless, let me try to summarize those and ask you if you think

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that is an accurate summary.

He indicated that the three immediate lessons were, one, that additional attention could usefully be paid to the general subject described as man-machine interface; second, that training, particularly including the use of the simulator, could enhance operator effectiveness and, third, and the licensing basis for nuclear plants should give greater emphasis and attention to potential transients.

Would you say that that is a fair summary of the three points that Mr. Fabrett made?

A Yes, in the very broadest sense, yes.

#13

Q Did you agree with his analysis of the lessons learned from TMI 2?

A I believe those three categories cover most of the lessons learned.

Q Would it be fair to say that another lesson learned, not presented by Mr. Fabrett, is the question of attention to experience, as to previous operating experience, particularly with respect to the Davis-Besse September 1977 transient?

A Well, let me say that I believe that the importance of evaluating operating experience and feeding that back into the training programs and the procedures for an operating unit is an important lesson learned,

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and I would have put that in the general category of  
4 operator effectiveness.

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Q Referring you to Page 76 of the transcript,  
and I quote now starting at Line 22:

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"We believe it was full of water" referring  
to the pressurizer. "But it was, what you might call an  
8 ambiguous indication, in the sense that, you could not  
9 interpret a full pressurizer level indication, as  
10 meaning the entire reactor coolant system was full of  
11 water."

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Does that appear to you to be a generally  
13 accurate transcription of your remarks on that occa-  
14 sion?

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A I think so, yes.

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Q And I take it you did feel that the pres-  
surizer level was an ambiguous indication?

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A I think you have to read the entire sentence.

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I said it was an ambiguous indication in the sense

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that you cannot interpret a full pressurizer level

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indication as meaning the entire reactor coolant system

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was full of water, and the significant parameter there,

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going on after the portion you read, "And the significant

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parameter there is the reactor coolant system pressure."

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Q Would it be fair to say there wouldn't be  
any question of the pressurizer level being an

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ambiguous indication if operators had not been used to interpreting the condition of the core, the water inventory in the core, from pressurizer level indication?

MR. EDGAR: There is no basis in the record that I know of for the last statement. I think we need a foundation for that.

Q Did you use the term "ambiguous indication"?

A Well, I guess the reason I used that is because it had been used widely in the industry up until that time to indicate that the level in the pressurizer was ambiguous, and I used that in order to draw a familiarity to previous statements that had been made.

I don't remember whether the person in phrasing this question had used that term or not, but many other people have. And so I used that in the sense that it had been used in previous situations to indicate that you cannot depend solely upon pressurizer level as an indication of the water inventory in the reactor coolant system. That is consistent through all the presentations that we have made.

Q In the text on Pages 76 and 77, is there any qualification made by you that your use of the term "ambiguous indication" was simply an adoption of somebody else's term, rather than your own expression?

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A I don't believe there is anything in that record that says that, no.

Q Directing your attention to Page 83 of the transcript --

A Could I just pause a minute. On Page 74 the question was asked from the audience, starting at Line 9, "Isn't it also correct that the pressurizer level gauge failed or gave an inappropriate reading?"

I believe the response that you quoted on Page 76 was directed toward that line of inquiry. Perhaps I should have said "inappropriate," rather than "ambiguous."

Q Directing your attention to Page 83 of the transcript, Line 24, quoting, "We don't believe that we have a blame in the Three Mile Island accident. We believe the inappropriate operator action was the significant factor which led to the core damage, and the subsequently released radioactivity."

Does that appear to be a generally accurate transcription of your remarks?

A Yes.

Q And you said that, I take it, knowing that your own staff had predicted precisely that inappropriate operator action and raised it as a matter of serious concern some 13 months before the TMI 2 accident?

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A And also in the knowledge that the emergency procedure in force at Three Mile Island at the time of the incident called for continued operation of HPI until both level and pressure could be maintained, and that those conditions were not met.

Q Is it your analysis at this time, Mr. MacMillan, that the accident at Three Mile Island is a relatively simple case of operator error?

A I think that is a gross misinterpretation of what has been said in any of the statements or in the press conference. The words which I have said is that we believe that inappropriate operator action was the significant factor.

Q Directing your attention to Page 84, Line 12 -- let me back up. I will start on Page 83, Line 24.

"We don't believe that we have a blame in the Three Mile Island accident. We believe the inappropriate operator action was the significant factor --"

A That is exactly what I just said. We believe that the inappropriate operator action was the significant factor. That is not what you stated in your question.

MR. EDGAR: Could we have a break.

(A brief recess was taken.)

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Q Mr. MacMillan, you have indicated that the Dunn memorandum remained within the organization and was not communicated to the outside world because of a process of addressing or attempting to resolve some conflict in technical analysis relating to the prescription of the Dunn memorandum. Is that accurate?

A That is my understanding, yes.

Q To your knowledge, from August 3rd of 1978, the date of the Hallman memorandum which you now have before you, which is marked as Deposition Exhibit 37, was anything done within the organization in the seven and a half to eight months from August 3, 1978 until March 28, 1979 toward resolving those differences?

A I have no knowledge of whether they were or were not.

Q Have you inquired of your organization?

A I have not.

Q Referring you to the press conference transcript, Page 84, Line 23, "I think the significant point in the Three Mile Island incident, is that when when we conducted that training prior to Three Mile Island, we made the presumption in the training that

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the emergency equipment would perform as designed."

Isn't that exactly the point that was being raised by Mr. Dunn in his memorandum, that perhaps the emergency equipment, or to put it more broadly, the emergency process would not perform as designed?

A What do you mean by "emergency process"?

Q The ability of operators to react appropriately in an emergency situation.

A I think if you broaden it to incorporate emergency process as you define it, I would agree that was the intent of the Dunn memo.

I don't believe that the intent of the Dunn memo was that emergency equipment would specifically not perform.

Q Referring you to Page 85, Line 17, "The significant thing here is that we did not train them at that time -- we have subsequently modified it -- we did not train them at that time, in the assumption that, in addition to the initial equipment fault, other equipment would be precluded from doing its job, because of inappropriate operator action."

Does that appear to you to be a generally accurate transcription of your remarks?

A I would say yes.

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Q Would it be fair to say that inappropriate operator action was precisely the issue being addressed by the Dunn memorandum in February of 1978?

A I think that would be fair, yes.

Q Referring you to Page 101 of the transcript, Line 21, I am picking up in the second paragraph of a question that was addressed to you. "There has been mention made of an incident, I believe in 1977, at the Davis-Besse plant, that has some bearing on, maybe some of the things that happened at Three Mile Island, and a report by a man for the TVA named Carlisle Michaelson, who rendered this report on it."

Obviously, for the record, it is not Carlisle Michaelson. But do you recall a question being addressed to you with regard to the Davis-Besse transient in 1977?

A Yes.

Q In your response to that question, which begins at Page 102, Line 8, and continues to Page 105, Line 8, did you ever make reference to the concerns made by Mr. Dunn?

A I don't believe so.

Q Referring you to Page 31 of the transcript, Line 3, I believe the transcript at that point is referring to the PORV, is that correct?

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A Yes.

Q Beginning at Line 3, "The failure of this valve is the only mechanical failure that occurred in the course of the accident." Was there not also a failure associated with the indication relating to the position of the PORV that was displayed to the operators in the control room?

A As far as I know, the position indicator on the PORV indicated what it was supposed to indicate, and that is whether or not the solenoid on the PORV was energized or de-energized.

Q And is my understanding correct that the solenoid indication indicated that it was energized, which an operator would interpret to mean that the valve was closed?

MR. EDGAR: There are two questions.

MR. ROCKWELL: I am asking two questions?

A The indicator, as I understand it, on the control panel, after the initial increase in pressure, which opened the pilot-operated relief valve, when that pressure decreased and the solenoid was de-energized, a light on the control panel indicated that the solenoid was de-energized, which, if taken as the sole indication of the position of



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the pilot-operated valve, would say the valve is closed. But in fact that indicator only shows whether or not the actuating solenoid is energized or not.

Q Have you given any attention since the accident to the question of whether it would be valuable for an operator to have an actual indication of the position of the PORV, as opposed simply to an indication of whether the solenoid was energized or not energized?

A Yes.

Q What is your conclusion in that regard?

A We have worked on a number of means by which the actual position -- excuse me -- we have worked on a number of means which would indicate whether or not the pilot-operated relief valve was open or shut, including such things as pressure drop and acoustical indicators, and we have developed and tested those and are prepared to offer those as additions, improvements, in the instrumentation of the newer planes.

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Q Had B&W considered before TMI 2 the use of a gauge or instrument for the PORV which would indicate actual position, as opposed to simply the energizing or not energizing of the solenoid?

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A I really can't answer that, other than to say that we recognize that relief valves of this type have a history of failing to completely close, and we did recommend the installation of thermocouples in the piping downstream of these valves and the safety valves, and pressure, temperature and level indicators and alarms in the quench tank, into which these valves discharge, so that the operator had a means of determining whether or not the valve had completely re-seated.

(Continued on Page 71.)

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Q Knowing the history of PORV failures to

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close, was it considered by B&W that a direct indica-

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tion of PORV position might be a considerably easier

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measure for an operator in an emergency setting to

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know the condition of his plant?

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A I simply don't know what the broad B&W Company

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had or had not done in that area. I think I can say

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that we felt that we had provided instrumentation

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which would give him the diagnostic capability of

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determining whether the valves had seated or not.

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Q Putting that question in terms of man-

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machine interface, in an emergency setting do you know

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whether B&W ever considered whether the relatively

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more involved procedure for determining PORV position

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might make emergency response by an operator in a

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plant more difficult?

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A I simply don't know whether that would have been

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considered or not. I would want to point out that

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this condition is not unique to the PORV. Similar

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conditions prevail for safety valves, not only on the

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pressurizer, but on the steam lines.

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So the provision that he made of thermocouples

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on the downstream piping and of pressure, temperature

and level indicators on quench tank were equally

applicable to safety valves, which have similar

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operational history.

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Q Do I correctly understand that during the TMI 2 sequence of events on the 28th that the computer in the control room either broke down or stopped functioning or in some manner stopped providing for the operators information that it was intended to provide?

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A You are getting into an area where I have rather limited knowledge. As I recall from what I have read in the transcript of the interviews of the operators and in some of the sequence of events, the alarm sequence printer paper jammed, causing it to fall behind in its recordings, and if that is what you mean by the computer failing, I would have to say, yes, that was a factor.

16

Q Is the computer that is used in the TMI 2 control room a Bailey computer?

18

A Yes.

19

Q Is the Bailey computer manufactured by a subsidiary of Babcock & Wilcox?

21

A The Bailey computer is supplied by the Bailey Controls Company, which is a subsidiary of B&W.

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Q Is the alarm printer a part of the Bailey computer?

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A I believe the answer to that is yes. I would

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want to confirm that though.

Q Referring you to Page 79 of the transcript,  
Line 14.

"Let me step back, first, in time, and  
let's recognize that that reactor control room was  
laid out and designed by Burns & Roe back in the late  
1960's. And so certainly, right now, it represents at  
least a 10-year old design.

"It's a design and type of configuration  
which evolved out of the utility practice in the design  
of control rooms for regular boilers, and was adapted  
and adjusted to reflect the unique requirements of a  
nuclear plant."

Did Babcock & Wilcox have any role in the  
design of the control room at TMI 2?

A Yes, I believe that we recommended an arrange-  
ment of the instrumentation that is used to monitor  
and control the nuclear steam system, and that recom-  
mendation was then incorporated in the total control  
room arrangement designed by Burns & Roe, and subse-  
quently through a process involving Burns & Roe and  
GPU there was arrived at a final configuration which  
GPU approved.

Q Do I understand correctly that Babcock &  
Wilcox played some role in the formulation of the



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final control room design?

A As it applied to that portion which is required to supply the nuclear steam system.

Q Mr. MacMillan, we spoke about Mr. Kosiba yesterday. Mr. Kosiba indicated that he had assumed his job as the manager of the then Nuclear Service, now Customer Service Department within B&W, in February of 1979. He further indicated that at the time of his assumption of those duties, he had a conversation with you in which you charged him with reviewing, analyzing and potentially restructuring the Customer Service Department within the company. What was your reason for asking Mr. Kosiba to undertake that review and evaluation? First of all, is my characterization of his testimony accurate with respect to your recollection of the conversation?

A I don't know what he testified. I can tell you that when he did take over the Customer Service or what is now the Customer Service organization, I did ask him to evaluate the structure of that organization and the basis on which we maintain and interface with our utilities who have operating units, and to that extent what you are saying certainly sounds familiar.

(Continued on following page.)

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Q I would like to quote from Mr. Kosiba's deposition, Page 11, Line 5, "He charged me" -- and I believe he is referring to you, Mr. MacMillan, when he uses the word "he" -- "He charged me to look at it afresh and see if by a rearranging and refocusing we could do a better job of assisting operating plants and giving it the emphasis, so that there was no connotation that the support of operating plants was a, let me say, second fiddle to supplying NSSS's."

MR. EDGAR: Would you read the entire page and get the total context of the question.

A Now what was your question?

Q Referring to the material I quoted, do you have this in mind?

A Yes.

Q Is that your recollection of the charge or part of the charge that you gave to Mr. Kosiba?

A I think, taking it in the total context of his answer, starting on Line 18 on Page 10 and carrying through the portion that you quoted, I would agree with the general thrust of that, yes.

Q Had you been concerned that the then Nuclear Service, now Customer Service Department, needed to be upgraded?

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A Let me step back and answer the question I think you were asking earlier about why did I ask him to look at this.

The Nuclear Power Generation Division started out with the prime business of supplying original equipment and nuclear steam systems and nuclear fuel.

The major portion of our operation, or the major thrust of our operation, the largest volume of sales for us, was in that category.

As more units got into operation, the opportunity for support of those in the servicing of those units increased, and we are in a business situation today in the nuclear business, which I am sure you are familiar with, where there is essentially no new business, no new original equipment business being sold.

There is ongoing fuel business and the supporting of the continuing operation of our nuclear plants. I felt and continue to feel that there is a good business opportunity for us to strengthen, focus and concentrate our technical capabilities as a division on the operation of our operating units and the support of our utilities that have operating units, in order to generate favorable financial

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3 performance. That was certainly one factor. The  
4 second factor was we had in various parts of the  
5 company service organizations. We had one group that  
6 was doing spare parts. We had another group doing  
7 in-service inspection, and another group doing  
8 field service, and one that had a training function.  
9 There was a special products function which was not  
10 really highlighted and given the kind of resources  
11 it ought to have.

12 So a second factor in the reorganization was  
13 to try to bring all that together into one organiza-  
14 tion that would be stronger and could give broader  
15 support and make an attractive business situation  
16 for the company.

17 That was part of the charge that I was giving  
18 Mr. Kosiba, is in some way to structure and organize  
19 and put resources into this operation which will make  
20 it more effective in supporting the customer, which  
21 has to be our ultimate service objective, and at the  
22 same time, an attractive business opportunity for us.

23 Q Had you had any expressions of concern  
24 or complaints from outside the company with respect  
25 to the performance or the ability of the Nuclear  
Service Department, which was at least a factor in  
the charge which you gave to Mr. Kosiba?

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3 A I don't recall any specific complaints, as you  
4 would say, coming from outside the company relative  
5 to the support that we were giving in our operating  
6 unit, and I think our fellows had been doing, in  
7 the eyes of our customers, had been doing a good job  
8 there.

9 But my interest in this approach was to get a  
10 stronger internal organization, which would allow  
11 us to do that job even better, and give the customer  
12 even more support than he had been asking us to  
13 provide in the operation of his equipment.

14 (Continued on Page 80.)  
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Q I believe in my question I used alternatively the concepts either of complaint or an expression of concern. Having those two phrases in mind, would that change your answer at all?

A I don't think so. We weren't motivated in the structuring of the service here by either complaints or expressions of concern outside. We were motivated by trying to do a better job for the customer and at the same time develop a stronger service business.

Q Mr. MacMillan, apart from the public statements which we have identified previously in this deposition, and I think something on the order of 10 or a dozen that you have made since the Three Mile Island accident, have you made any other statements since March 28, 1979, and by "statements" I mean either a statement of your own knowledge of TMI 2, which you wrote, or a transcribed interview taken by anyone?

A Well, let me answer the second part. I don't believe I have had any transcribed interviews.

Q The NRC has not interviewed you?

A No.

Q Have you made any statements or have you written anything which you have not used in a public forum, but which nonetheless refers to or summarizes



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or analyzes or explains your understanding of the  
events surrounding Three Mile Island?

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A Well, let me say, first of all, clearly I have  
had a lot of discussions in many different forums about  
Three Mile Island and what were the lessons to be  
learned from that, what should we as an industry be  
doing differently in the future.

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Q I am not referring to discussions. I am

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referring to something which ultimately gets reduced  
to paper.

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A I don't believe so. I don't recall that any of  
that has been reduced to paper. Maybe I ought to check  
that just to make sure. But most of the interface I  
have had, the interchange I've had, has been verbal.

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Q If you find that you have reduced a state-  
ment or an interview or something else to paper which  
we have not covered here, could you please advise us  
through Mr. Edgar?

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A Certainly.

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Q I would include in that any reports that  
you may have submitted up the line in Babcock & Wilcox  
relating to the TMI accident.

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A I really ought to go back and look for my files.

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MR. EDGAR: One other point for the record.

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We have run a check, and there does not appear

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to be a prepared written statement of the Weaver Task Force. It was apparently a view graph presentation. We are trying to locate the view graph, if we can, but there was no separate statement per se.

Q Mr. MacMillan, would you refer please to Page 75 of the press conference transcript. First let us turn back to Page 74 for a moment. When we listened to the tape that we were provided, we were confused because there was an interruption beginning with the very last word on Page 74, and the next on Page 75 through to Line 9 of Page 76, which did not appear to be part of the press conference. It appeared to be something separate in terms of the tone and what we could hear on the tape. We raised this question with Mr. Edgar last night, and we have since reviewed the videotape of that press conference, and it appears that the comments that you were making, that you were in the midst of making at Page 74, continue uninterruptedly from the text at the bottom of Page 74 to the text beginning on Lines 10 and 11 of Page 76. The language from the top of Page 75 to Line 9 on Page 76 is not on the videotape. It appears to have found its way into the tapes by some other means, and it appears to me in looking at that language and looking at what is

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written down on Page 75 and through Line 9 on Page 76,  
it may have been a preparation session between you  
and some of your advisors in which you were reviewing  
how you would handle the press conference and what  
approach you would take for certain questions or how  
you would structure your comments.

A Yes, it certainly looks like that.

Q Do you recall that a preparation session  
was taped?

A Oh, sure.

MR. ROCKWELL: We would ask for a copy of  
the tape of that preparation session, if it is  
still in existence.

THE WITNESS: That I don't know.

Q Do you know whether any other strategy  
sessions that you had in preparing your testimony or in  
analyzing the TMI 2 sequence of events were taped?  
Is that a common procedure?

A Not to my knowledge. I believe what we did is  
we went through a dress rehearsal for the press presen-  
tation, and part of the dress rehearsal was to give  
the audiovisual people from the company a chance to  
try out their cameras and try out the audio equipment.  
For that reason I believe it was taped. It was not  
intended to be kept as any kind of permanent record.

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We did intend to get a videotape and an audiotape of the actual press conference. The dress rehearsal was taped merely as a convenience to the technicians.

Q Do you know whether there were any other meetings or sessions that you were involved with in terms of discussing matters relating to the TMI 2 were taped?

A I am not aware of any.

Q But if the tape, of which the text on Page 75 and 76 appear to be an excerpt, is in existence, we would appreciate receiving a copy of it, the audio portion, that is. Is that agreeable?

MR. EDGAR: Yes.

MR. ROCKWELL: Mr. MacMillan, we will recess your deposition at this time. This is a standard procedure we have been following with all depositions, leaving you subject to recall for further testimony should it appear to be necessary. We do not have any present plans to ask you to testify again, but it is possible that we would

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need to at some future date and, therefore, we  
are recessing at this time. Thank you very  
much.

(The deposition adjourned at 3:30 p.m.)

-----  
John H. MacMillan

Subscribed and sworn to  
before me this \_\_\_\_\_  
day of \_\_\_\_\_  
1979

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Notary Public

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John H. MacMillan

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MacMillan Deposition

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For IdentificationPage

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Resume of John H. MacMillan 2  
dated July 3, 1979

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Letter of May 21, 1979 to 29  
Mr. Weaver as head of Sub-  
committee on Energy and the  
Environment, prepared by  
Mr. MacMillan.

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Document of prepared oral 30  
testimony by Mr. MacMillan  
before the Weaver Subcommittee  
dated May 24, 1979

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Copy of Babcock & Wilcox 30  
prepared statement before  
Subcommittee on Energy and  
the Environment dated May 24,  
1979.

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Transcript of testimony by 31  
Mr. MacMillan before the  
Subcommittee on Energy and  
the Environment, dated  
May 24, 1979

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Transcript of a press con- 32  
ference held June 5, 1979  
in Lynchburg

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## C-E-R-T-I-F-I-C-A-T-E

STATE OF NEW YORK )  
 ) ss:  
COUNTY OF NEW YORK )

We, IRWIN H. BENJAMIN, STANLEY RUDBARG,  
Certified Shorthand Reporters and Notaries Public of  
the State of New York, and ROBERT ZERKIN, Notary Public  
of the State of New York, do hereby certify that the  
foregoing deposition of JOHN H. MacMILLAN was taken  
before us on the 5th day of July, 1979.

The said witness was duly sworn before the  
commencement of his testimony; that the said testimony  
was taken stenographically by ourselves and then  
transcribed.

The within transcript is a true record of  
the said deposition.

We are not related by blood or marriage  
to any of the said parties, nor interested directly  
or indirectly in the matter in controversy, nor are we  
in the employ of any of the counsel.

IN WITNESS WHEREOF, we have hereunto set  
our hands this 5th day of July, 1979.

-----  
IRWIN H. BENJAMIN, CSR

-----  
STANLEY RUDBARG, CSR

-----  
ROBERT ZERKIN