MALLAY - EXP 7

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PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

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DEPOSITION of BABCOCK & WILCOX by JAMES FRANCIS MALLAY, held at the offices of Babcock & Wilcox, Old Forest Road, Lynchburg, Virginia 24505, on the 7th day of July, 1979, commencing at 8:15 a.m., before Stanley Rudbarg, Certified Shorthand Reporter and Notary Public of the State of New York.

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ALSO PRESENT:

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(Resume of James Francis Mallay was marked Mallay Deposition Exhibit 107 for identification, this date.)

J A M E S F R A N C I S M A L L A Y, having been duly sworn by Winthrop A. Rockwell, Esq., was called as a witness and testified as follows:

DIRECT EXAMINATION

BY MR. ROCKWELL:

Q Would you state your full name?

A James Francis Mallay.

Q Would you state your current employer?

A My current employer is Babcock & Wilcox in Lyncyburg, Virginia.

Q What is your current business address?

A Box 1260, Lynchburg, Virginia.

Q And your current position with Babcock & Wilcox?

A Program manager, BBR.

Q Mr. Mallay, you were manager of Licensing for B&W from 1971 through April of 1975, is that correct?

A That is correct.

Q And that is included on your resume which you brought with you here today, and which is presently before you, marked as Mallay Deposition Exhibit No. 107,

is that correct?

A That is correct.

Q Did you prepare this resume?

A Yes, I did.

Q Is it accurate and complete to the best of your knowledge?

A To the best of my knowledge, it is accurate and complete.

Q At the time you were manager of Licensing, Mr. Mallay, is it to the best of your understanding or was it to the best of your understanding organized generally along the lines that the department or section of Licensing are organized now?

A Yes, the organization then and now was very similar.

Q During that period of time [illegible] there a procedure within the Licensing Department for the handling of safety questions?

A There was an understanding at that time as to how licensing questions were to be handled. I do not recall a specific approved written procedure.

Q My question was directed to safety questions, not licensing questions. Did you intend it --

MR. EDGAR: You mean safety concerns?

MR. ROCKWELL: Safety concerns, yes.

A Yes, I interpreted the question to be both safety and licensing questions. I interpret that to be safety questions addressed by the NRC to B&W.

Q Okay. You indicate that there was a procedure within the Licensing Department to handle safety concerns raised by the NRC which were addressed to B&W?

A There was an understanding as to how to handle those. There was not an approved written procedure to my knowledge.

Q But the issue we are addressing now is safety concerns raised by the NRC and addressed to B&W, is that correct?

A Yes.

Q And the understanding as to how those would be handled was what?

A If they were addressed directly to B&W as a generic question, they would be responded to by the appropriate engineering unit working through the responsible licensing engineer, and the answer would be signed off by the manager of Licensing, who at that time was myself.

Q How about safety questions or safety concerns raised within B&W or from one of your operating utilities; was there a procedure for handling those

kinds of questions?

A During the very last portion of the time that I was manager of Licensing, there was a written procedure for handling safety questions arising within B&W.

Q You say that was toward the end?

A Yes.

Q Can you give me your best estimate as to the time that procedure was implemented?

A It was probably implemented in mid-1974.

Q And what gave rise to that procedure coming into existence and being put into place at B&W?

A To the best of my recollection it was partly a result of the NRC proposed regulation Part 21.

Q And can you tell me what the procedure was that was implemented and put into place in 1974? Can you describe its elements to me as best you recall?

A I have not looked at the procedure in a few years, but to the best of my recollection in the sequence of events it would be for the person who identified a potential safety problem would prepare a summary of that problem in writing and send it directly to me. I would review this written testimony, and after my review would sit down with the originator to determine further details of what he identified as the potential safety problem.

If it appeared that the problem affected operating reactors and was indeed a significant safety problem, I would advise the utility involved to in turn advise the NRC. If the safety problem involved an ongoing licensing matter, that is one involving a plant not yet in operation but in the licensing process, I would prepare or have prepared a detailed written description of the safety problem for presentation to the involved utilities.

Since the utilities are the owners and operators of the plants, it was then their responsibility to determine whether direct reporting to the NRC was appropriate.

During that period, namely mid-1974 to early 1975, I believe there were two such significant safety items reported to the NRC through our utility customers.

(Continued on following page.)

SR 2 1c

Q That would be that the utilities initiated the report rather than yourself?

A I initiated the report, but they actually reported it to the NRC.

Q Who raised the safety concerns that you are referring to?

A One was raised within Fuel Engineering Department and related to the heat capacity of the fuel assemblies.

Q So one came from within the B&W organization?

A Yes.

Q Did the other one come also from within?

A Yes. I am trying to think what the other one was, and I cannot recall the exact topic. I can simply recall having had discussions with the NRC on the second one, but I can't recall the topic. But it, too, was identified within B&W and was reported as a result of our initiative.

Q Once you implemented, or once that procedure was drawn up, was it brought to the attention of the organization here in Lynchburg by way of notification that such a procedure had been devised and was now intended to function?

A This particular procedure was reviewed in detail with our management, namely our division vice-president, his superior, who was the vice-president of the Nuclear Division, and his superior,

who is Group Vice President. They were all briefed in detail by myself on the procedures.

Q Were the rank and file of employees within the Nuclear Power Generating Division briefed so that they would understand how to take advantage of the procedure that had been devised, should they identify a safety concern?

A The management within this division was briefed personally by myself, that is, down to the unit manager level. Every employee then receives the procedure itself. Whether they were in turn briefed by the unit managers, I cannot say.

Q Mr. Mallay, to the best of your understanding in the procedure that you have just described, was there any magic requirement that the process of bringing a safety concern to your attention had to be recorded on a particular form?

MR. EDGAR: What do you mean by "magic"?

MR. ROCKWELL: Strike the word "magic."

A I do not recall a particular form being required. It simply had to be in writing, was my recollection.

Q Had you received a report in writing from someone within the organization in whatever form, assuming it was addressed to you, would you have regarded that as the initiation of the procedure

which had been set up?

A Yes, I would.

Q And it was generally understood that you were the person, as manager of the Licensing Section, to whom these concerns would be addressed?

A Yes. Maybe I will add at that point, just to clarify why I say "yes," that I had received during the period of time from mid-1974 to early 1975 possibly 8 to 12 written communications regarding possible safety problems.

After a detailed review, most of them were regarded as not significant safety problems.

Q But I take it the fundamental underlying purpose of the procedure that had been devised was to have a central place to which safety concerns could be referred, even reviewed for the process you have just described, to sort out essentially the wheat from the chaff?

A Not only central, but relatively independent of the ongoing engineering work, so that an independent assessment could be made of possible safety problems.

Q You indicated that the procedure which at least you followed was to sit down with the person initiating the concern and talk to them about it?

A Yes, that is correct.

Q Did you do that in most every case.

A Oh, yes.

Q Did you feel that was an important part of the assessment of a safety concern in this process?

A Very much so. And during this discussion, of course, it would be not just the originator and myself, but other independent technical people who were familiar with the topic, in order to determine the possible impact on other plants.

Q And would those other people that you would bring or have involved in the process be brought in at your initiative or at someone else's initiative?

A At my initiative.

Q At that time, if in your judgment the concern reached whatever threshold there was that you felt required a report to the NRC, how would you handle it at that point?

A I would notify directly the utilities involved.

Q And then what would happen?

A My recommendation would be for them to in turn report it to the NRC.

(Continued on Page 12.)

3.1
SR/EW

Q Was there a particular defined threshold at that point which had to be reached before a matter in your mind should be or could be reported to the NRC?

A Not a quantitative criterion, no.

Q How would you make that judgment? What factor would you take into account in making that judgment?

A The factors involved would be whether or not it would affect the normal operation of a reactor or whether it would adversely affect the functioning of any safety-related system in the plant during its normal operation or during any accident situation. Also whether or not the discovery would affect the bases for any of the safety analysis performed.

MR. EDGAR: By that you mean whether it affected the validity of the safety analysis?

THE WITNESS: Correct. Whether it would affect the validity of the safety analysis in a non-conservative way.

(There was discussion off the record.)

Q Mr. Mallay, with reference to the three underlying factors which you took into account in making your judgment as to whether a particular matter might be reportable to the NRC, can you tell me where,

3.2 in your mind, these factors came from. Were those factors which you had formulated in your own judgment or were they factors which you had in mind by reference to some standard or by reference to NRC requirement?

A These particular factors were based primarily on my own judgment, plus my experience in having worked with the NRC for several years, in understanding the requirements for safety of nuclear power plants.

Q At that time was there a particular specific reporting requirement for safety concerns to the NRC?

A No, I don't believe there was any regulation requiring this.

Q Then is my understanding correct that, with the advent of Part 21, there was formalized a procedure?

A Yes.

Q And some definitions?

A Right.

Q As to what safety concerns should be reported?

A That is correct. But I believe that was after I left that position.

Q Is my understanding correct that the first adoption of Part 21 was in 1978 or was the first

adoption of Part 21 earlier than that to your knowledge?
A To my knowledge it was earlier than 1978, but I cannot recall the date.
Q Did you reduce this procedure that you have described to me to writing in the sense of it being a relatively fixed procedure within the organization, before you left the position of manager of Licensing?
A Yes, it had been reduced to writing. As I recall, it was about two pages long and was posted in the building here.
Q Do you know whether you have a copy of that procedure today?
A I am sure I do not, myself.
Q Could you see if you could find for yourself a copy of the procedure as it was then formulated under your management of the Licensing Department?
A Okay.
Q And provide us a copy?
A I will attempt to do that.
Q Thank you. You indicated, Mr. Mallay, that you had a briefing -- once the procedure that you had been describing had been adopted, you had a briefing within B&W down to the unit manager level?

A Yes, that was my recollection.

Q Would that have included Mr. Dunn, if he were a unit manager at that time?

A If he were a unit manager, it would have included him. I don't recall whether he was manager of ECCS analysis at that time or not. My recollection was that he was not.

Q At the time you developed this procedure, Mr. Mallay, did you also develop a tracking procedure as part of the procedure for seeing to it that the concerns which were brought to your attention were given timely attention and ultimately resolved?

A The procedure I believe specified the time in which I had to act, and the procedure was subject to internal Q.A. audit.

Q What is your recollection of the time deadline that you imposed on yourself by this procedure?

A In the order of two weeks.

Q And was it your practice to exercise the control over resolution of these issues personally or to delegate that to someone within your section?

A I would usually delegate the investigation to someone, but the determination and final decision and discussion with the originator were all handled personally.

Q Was Mr. Kane in the department, the section, excuse me, when you were there?

A Yes, I believe so.

Q Did he become involved in this process at all to your recollection?

A I do not recall that he was involved in any of these.

Q Are you familiar with the reporting requirements of Part 21 as they are today?

A Vaguely.

Q Are you familiar with the in-house procedure as it is today for the handling and tracking of safety concerns?

A No, I am not.

(Continued on following page.)

RZ 4

Q Would reporting of safety concerns on the procedures which you established and during the time when you were manager of the Licensing Section, always have been through utilities rather than directly by B&W, or would there have been occasions when B&W would have contacted the NRC directly or, as it was known at that time, the AEC?

A My recollection is that the procedure permitted me to report directly to the NRC, depending on the level of the safety concern and how generic it would be.

Q I take it that to the extent it was generic, it might be more likely that B&W would make the report rather than asking each individual utility to make the report?

A That is true, although I think it depended more on the severity of the safety problem. Obviously, if it was a very significant problem that might affect operation today, I would have the obligation to actually call the NRC on my own directly, even if it involved only a single plant.

Q And that would be simply because of the urgency of time?

A Yes, because of the urgency of time.

Q Mr. Mallay, showing you what has previously been marked Womack Deposition Exhibit 23, are you

familiar with that document?

A I have not seen the document, and I do not recall the topic.

Q Would you take a moment, please, and read it, and let me ask you while you are reading it to read also what has previously been marked as Dunn Deposition Exhibit 36.

Mr. Mallay, have you now had a chance to read what has previously been marked as Womack Deposition Exhibit 23 and also what has previously been marked as Dunn Deposition Exhibit 36?

A Yes, I have read these two exhibits.

Q For the record, they are memoranda from Bert Dunn to Jim Taylor, dated February 9 and February 16, 1978, respectively, is that correct?

A That is correct.

Q Having had a chance to look at these memoranda, Mr. Mallay, would you say that is the kind of concern that you had in mind when you set up the procedures that you did set up in 1974?

MR. EDGAR: I object to the manner in which the question was presented. It is presented hypothetically, and Mr. Mallay has not had a chance to review the memos for more than two minutes. He does not have the context.

He does not understand the circumstances prevailing at the time. There is a lack of foundation for this type of question. You are asking him a hypothetical question in the abstract for a situation of which he has no real knowledge.

MR. ROCKWELL: Let me try to rephrase the question.

Q Mr. Mallay, had you received in 1974 and early 1975, when you were manager of the Licensing Section and when the procedure that you already described to us was in effect, had you received these two memoranda, would you have processed them in accordance with the procedure that you described to us?

A Had I received this memo of February 9 from Mr. Dunn at that point in time, I believe I would have proceeded with the procedure I have described to you.

Q Based on your review of either or both of the memoranda which you have before you, do they strike you as the kind of safety concern that was intended to be encompassed by the procedures that were established in 1974?

A My initial reaction to the memo of February 9 from Mr. Dunn to Mr. Taylor is that it certainly

falls within the procedure as I had intended it to be used.

Q With respect to the February 16 memorandum, which is identified as Exhibit 36, had you been familiar with that memorandum before you read it a moment ago?

A No, I had not seen it before, nor had I heard of the topic.

Q Before today?

A Before today.

MR. EDGAR: And you are not familiar with any of the circumstances surrounding the topic?

THE WITNESS: That is correct, I am not familiar with any of the circumstances surrounding this topic at all.

Q Mr. Mallay, let me ask you to review Exhibits 24, 35 and 37, having the question in mind whether you had seen the documents before or whether you had been aware of the concern or issues raised in the documents before today.

MR. EDGAR: Please note our continuing objection to this line of questioning.

MR. ROCKWELL: What is the objection to this question?

MR. EDGAR: Essentially the same objection.

There is a lack of foundation to the question, and it is essentially the same as the previous objection I stated.

MR. ROCKWELL: The question is whether he has ever seen the documents before. Is there any objection to that?

MR. EDGAR: No, there is no objection to that.

Q Please address that question, Mr. Mallay.

A In looking at the documents, I do not believe I have seen them before.

Q To the best of your knowledge, had the issues and concerns raised in those documents come to your attention before today?

A I will need to review them first.

Q Please take whatever time is necessary.

A The only thing with which I am familiar that was discussed in these three exhibits is the fact that a transient occurred at the Davis-Besse plant. I was not familiar with any of the details at that transient nor any actions taken subsequent to that transient.

(Continued on Page 22.)

5.1 rz/ew

Q Mr. Mallay, your resume indicates that you have been program manager for BBR which, I understand, stands for Brown Boveri Reactors, since August of 1977, is that correct?

A That is correct.

Q Have you been living in Germany since that period of time?

A No, I have been living here.

Q Where?

A Lynchburg.

Q And working out of the Nuclear Power Generating Division?

A Yes, I work within NPGD.

Q Referring you to what has been previously marked as Dunn Deposition Exhibit 38, could you review it and tell me whether you have seen that document before.

A I have not seen the document before.

Q Have you ever heard of a concern raised by Mr. Novak, as outlined in the document before today, and let us make it, rather, before March 28, 1979?

A Prior to March 28, 1979, I was not familiar with such a subject.

Q Before March 28, 1979 had you become aware of what is now known as the Michaelson report?

5.2 A Prior to that time I had not heard of the so-called Michaelson report.

Q You do understand what I am referring to, in referring to the Michaelson report?

A I have not personally reviewed the Michaelson report; however, I have been involved in discussions where this report was referred to, and I believe I have a general understanding of its content.

Q Specifically, Mr. Mallay, had you ever been aware before March 28, 1979 of a concern that operators in responding to a transient involving a small break LOCA might terminate high pressure injection prematurely based upon a focus on pressurizer level alone?

A No. In my considerations of the small break analyses, it was always my understanding that the operators were to keep the high pressure injection on at all times. It was clearly recognized on my part that this was because the pressurizer could go solid for certain spectra of small breaks, and it was not of any concern to me that this take place. The importance always in the discussions I have had on small breaks was to maintain high pressure injection.

Q To your understanding, Mr. Mallay, has there ever been a concern within the B&W organization

5.3

about going solid under such conditions?

A There was never any concern in the discussions that I had. It was well understood that this would occur. We did not have all the characterizations of the valve response under such conditions, but that did not concern us from a safety standpoint.

Q Mr. Mallay, referring you to what has previously been marked as Rogers Exhibit 16, which is apparently a draft revision of operator procedure 2102-1.3, relating to pressurizer operation, and within that procedure I refer you to Section 2, entitled "Limits and Precautions," and specifically Section 2.1.8 which states:

"The pressurizer reactor coolant system must not be filled with coolant to solid conditions (400 inches) at any time except as required for system hydrostatic tests."

Have you seen that operator instruction before?

A I have not seen this operator instruction before.

Q Are you familiar generally with the fact that such an instruction was in existence before?

A I am not familiar with any of the operating instructions to any of our operating plants. However, I am familiar with the philosophy that during normal

5.4 operation such a requirement be understood, and I emphasize, "during normal operation."

Q Does the operating procedure to which we are referring, and specifically the section to which we are referring, Section 2.1.6, limit by its terms the inscription to normal operation?

A I could not answer that question without knowing the context in which this procedure is normally used.

MR. EDGAR: He is not familiar with operating procedures, he said. His answer was based on his understanding.

Q Would it be possible for you to review the procedure which we have before us as Rogers Deposition Exhibit 16, and then provide an answer to the question?

A I suspect not, because I would have to know what other operating procedures it went with, and the normal instructions that the operator would have to have under other than normal operating conditions.

MR. ROCKWELL: Off the record.

(Discussion held off the record, following which a brief recess was taken.)

I 6 1c

Q Mr. Mallay, referring you to what has previously been marked as Lind Deposition Exhibit 59, and let me advise you that this has previously been identified in the record as a set of B&W procedures which are used here at the B&W Department of Training program, and do I correctly identify it as a document entitled, "Operations Manual for Nuclear Power Plant Simulator"?

A Yes.

Q Referring you within that document to Section 1202, Operator Procedure 12026, and specifically to Section 5.2.5, could you take a moment to look at it. (Handing.)

MR. EDGAR: Would you look at the whole procedure. Take your time.

A Yes, I have read certain excerpts from this Section OP 12026.

Q In reference to Section 5.2.5, do you have that before you?

A Yes, I have it before me.

Q Have you ever seen that procedure before you reviewed it today?

A No, I have not seen any portion of this procedure.

Q If an operator were faced with a situation

where reactor coolant pressure was tending in one direction and pressurizer level was tending in the opposite direction, can you tell me your interpretation of how that procedure should be applied.

A My preliminary reading of this particular excerpt does not appear to cover that particular case. However, my knowledge of response to small break analyses, as I have indicated to you before, indicates that one would continue to leave the high-pressure injection flow on in the event of any decrease in pressure.

Q In your work on small break analyses, Mr. Mallay, did you have occasion at any time to review operating and emergency procedures in light of the research and work you were doing with respect to small breaks?

A I do not have any recollection of reviewing procedures regarding operator response to small break analyses during any of my previous work experience.

Q During your work in the Engineering Department at B&W in the various positions that you have held, to your knowledge has there ever been a procedure that design engineers should be reviewing operating instructions or emergency instructions

currently in use at the time that they are doing their work in light of the design questions which they are addressing and which they are working on?

A I'd have to have that question repeated, please.

(Last pending question read.)

A To my knowledge, NPGD has always had a procedure wherein the design engineer responsible for the area having to do with that operating procedure would review it and approve it prior to its being placed into use.

Q Is that review of operating or emergency procedures by a design engineer written down anywhere in terms of B&W's internal procedures?

A I believe it is in a written procedure, yes.

Q Which one?

A I would have no idea. I have not seen that procedure for close to 10 years.

Q As a practical matter, do you know whether design engineers have in fact, as a matter of routine, reviewed operating and emergency procedures in light of their design work?

A Yes. It is my recollection that it was a normal part of our operating work to review all of these procedures and sign off on them prior to their being put into use, and in fact, I have personally reviewed

many procedures, but none involving small break analyses.

Q Can you tell me in somewhat more detail how the review and signing off on an emergency or operating procedure is accomplished by a design engineer?

A My experience would be for the engineer most familiar with that particular procedure or the analyses on which that procedure was involved to do a detailed review of the procedure in light of the analysis that he had done for that plant or for a similar plant.

After his review, if he had any questions, he would review it with the person who prepared the procedure. Following that review and any changes to the procedure as a result of that review, the responsible engineer would present the result to his unit manager, and it would be the unit manager who would sign off on the procedure if he were satisfied.

Q When you say the unit manager would sign off on the procedure, do you mean that in a literal sense, in the sense that the unit manager would make a record that the procedure in question had been reviewed by a particular design engineer and that

it was satisfactory to that unit?

A It is my recollection that the procedure had a cover sheet on it that he would personally sign. I do not believe the unit manager kept any record of such a review or the sign-off.

Q What would happen to the sign-off sheet, do you know?

A I do not know what happened to it. It went into what was then called the Nuclear Service Department and, I presume, put in a file, but I don't know that for a fact.

Q To whom in the Nuclear Service Department would a procedure which had been reviewed and signed off on by an engineer or an engineering unit be addressed?

A I believe at the time that I was reviewing such procedure, it was the manager responsible for preparation of operation procedures, and it would be sent to him.

(Continued on Page 31.)

7.1
rc/aw

Q Showing you what has been previously marked as Willse Deposition Exhibit 2, this has been earlier identified as an organization chart for the Nuclear Service Department and this, I believe, is intended to reflect the Nuclear Service Department as it existed in 1978. (Handing.)

Are you able to identify where in the Nuclear Service Department, according to that chart, the manager in charge of the functions which you have just described would be, and the function being the receipt of the procedures which have been reviewed and signed off by the Engineering Department?

MR. EDGAR: If you know.

A Yes. I am not currently familiar with their organization nor would it have been necessary for me to be familiar with their organization at that time because it was clearly identified on the cover sheet to whom the procedure was to be returned.

Q Was that a standard form that was used, to your recollection?

A Yes, I believe it was.

Q Would you have a recollection of where, functionally, in the Nuclear Service Department the coordination of operating and emergency procedure review would occur?

7.2 A I am not familiar with that -- with their current organization.

Q Would it be helpful to look at an organization chart for the Nuclear Service Department for 1974 or 1975?

A I suspect not for the purpose of my trying to answer this type of question.

Q Do you remember any names of people who served the function in any years past and the function I refer to is that which you have just described?

A No, I do not.

Q Mr. Mallay, to your knowledge, was the possibility of voiding in the core of the NSSS system a predicted result of the design of that system adopted by B&W, and let us refer to the type of NSSS system in place at TMI 2?

A I do not recall any analyses that predicted that voiding would occur in any portion of the core as a result of any accident.

Q Would it then be a fair statement to say that there also would not have been any analyses predicting that as a consequence of voiding, pressurizer level in certain accident circumstances could increase while reactor coolant inventory was decreasing, thereby creating a departure in the normal relationship

7.3 that pressurizer level bears to inventory in the core?
A I don't believe that would necessarily be a logical conclusion.
Q Why not?
A My technical expertise does not extend to the actual analyses of small breaks, but it is my understanding that it is certainly not nessary to create any voiding in the core for such a phenomenon to occur whereby the pressure would be decreasing whereas the pressurizer level would be stable or increasing.
Q What other circumstances could lead to that situation?
A I don't know. I don't have any knowledge to answer that.
Q Was the possibility of a variation from the normal relationship between the pressurizer level and water inventory in the core known or understood before September of 1977?
MR. EDGAR: Do we have a foundation for the normal relationship?
Q Would it be fair to say that pressurizer level normally correlates or tends in the same direction as water inventory in the core?
A I don't have sufficient knowledge to answer that for all conditions.

7.4

Q Could you address the question with respect to whether pressurizer level normally in most circumstances correlates or tends in the same direction as water inventory in the core?

A Yes, under most conditions that would occur.

Q Do you know whether there had been any prediction or any understanding that there would be a departure from that normal relationship between pressurizer level and water inventory in the core by the Engineering Department here at B&W before September 1977?

A Yes, I can recall both Mr. Parks and Mr. Dunn discussing a situation in which there was anomalous behavior of pressurizer level and pressure during certain small breaks, specifically in the cold leg.

I do not know -- I do not recall any of the details of such discussion nor do I have the precise technical knowledge to understand it, but I did work closely with both of those gentlemen and could recall them discussing such a situation.

Q Do you know when that discussion would have taken place?

A Yes, it would have been during the preparations for the ECCS hearings that occurred in -- in 1972 or 1973? In approximately that time period.

7.5 Q You used the term in your answer a moment ago of "anomalous behavior." Can you tell me what you mean by that?

A In the context of the previous question, namely where pressurizer level did not precisely correlate with water pressure in the reactor coolant system.

Q Do you know whether their perception went so far or extended to an understanding that where the pressurizer level could be growing higher or even solid and reactor coolant inventory could be going substantially low?

A No, I cannot recall that.

Q When you say you cannot recall that, you cannot recall that their analysis extended to that kind of situation?

A Correct. I do not have any idea how far the analysis extended, nor do I have an understanding of their understanding of how far this situation might pertain.

MR. EDGAR: You just do not recall anything about the cases?

THE WITNESS: That is right.

(Continued on following page.)

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Q Could you define for us, Mr. Mallay, your area of expertise.

A I am an engineering manager.

Q Could you elaborate.

A My primary expertise has been for several years that of managing people and managing programs, and has not been involved for several years in the detailed engineering analysis or design of specific systems.

Q At one time you were a working hands-on engineer, is that correct?

A That is correct. My primary expertise is in transient analysis, heat transfer and reactor physics.

Q When you say that one of your areas of expertise has been transient analysis, can you be more specific with respect to what you mean by an expertise focusing on transient analysis?

A I was the person who developed most of the methods and computer codes used at B&W for transient analysis, with the exception of loss of coolant accident.

Q Was your work involved in transient analysis with respect to transients that actually occurred in the field and in analyzing them for what they had to tell a design engineer about the way a

system was responding in actual operation?

A The analyses I performed were primarily for the purpose of the safety analysis reports submitted to the NRC. They were rarely associated with realistic situations or actual occurrences.

Q Did your work involve, however, analyzing realistic or actual situations?

A I may have performed a few benchmark cases, but that would have been very rare.

Q To your understanding, at the time you were doing that work, was there anyone doing transient analysis not in a hypothetical sense, but in an actual sense, addressing actual transients that were occurring in opeation, and asking what does this mean and how did it happen?

A I cannot recall anyone doing that type of work either at B&W or any other place.

Q When you were doing transient analysis --

MR. EDGAR: Can I get a clarification of what time frame we are talking about?

MR. ROCKWELL: I am just about to ask a time question.

MR. EDGAR: Is it at a time like 1965 through 1971?

MR. ROCKWELL: I am about to proceed to

define the question of time.

Q When were you doing the transient analyses?

A These analyses were performed from 1961 to 1969.

Q And your previous answer was in reference to that time frame?

A Yes, my previous answer was in reference to that time frame.

Q Since that time period of 1969, do you know whether there has been anyone at B&W charged with transient analyses not in a theoretical sense, but in the sense of a transient analysis of actual operating transients?

A My only recollections are people in the technical staff section of NPGD who are following certain tests being done at Idaho, in particular semi-scale tests and lost --

Q How about transients occurring in utilities involving NSSS systems manufactured by B&W?

A To my knowledge, there is no one particularly charged with that particular responsibility.

Q You indicated the transient analysis of small breaks was not within your area, is that correct?

A That is correct. I have never personally

performed an analysis of a small break.

Q Who has done that work within the NPGD organization?

A Primarily that work has been done by Charlie Parks and Bert Dunn, and people who currently work for Bert Dunn, of course.

Q Was there anyone else, to your knowledge?

A As I mentioned before, there are some people within our technical staff section who I believe performed some benchmark cases; they would be Joe Cudlin and the people working for him.

Q What department is the technical staff section that you described?

A The technical staff is within the Engineering Department.

Q Do you know, Mr. Mallay, whether before March 28, 1979 B&W had ever advised any of its operating utilities of the possibility that pressurizer level and water inventory in the core could be subject to, as you put it earlier, anomalous behavior, or in lay terms, a departure from the normal relationship which they bear in operation?

A I have no knowledge of information being passed along to our operating reactors specifically on this subject.

Q Do you know whether such information was passed to the NRC before March 28, 1979?

A I believe a topical report was submitted to the NRC indicating such behavior.

Q Which topical report would that have been?

A I don't recall, but it was the -- my recollection is it was in the 101-series. In other words, it would be 101-something.

Q Do you recall the title of the report or generally what the report was addressed to?

A I believe the topical report was on small break analyses. It is a report, I believe, that has been updated on several occasions.

(Continued on Page 41.)

Q Are you familiar, Mr. Mallay, with the process by which criteria for containment isolation were established in the design of TMI 2?

A I may have some recollection of certain portions of how that criteria came about. I am sure I could not sketch for you the entire history of how it came about.

Q Would that have occurred when you were manager of the Licensing Section; in other words, from 1971 to 1975?

A I am not sure, although it is my recollection that it probably occurred while I was manager of Safety Analysis.

Q That would have been from 1969 to 1971?

A Yes, during the construction permit stage, is my recollection.

Q Can you tell me what recollection you do have of the process by which the criteria were established, namely the criteria for containment isolation?

A I will tell you the best to my recollection, and I have not reviewed this in many years, so it may not be entirely correct, but my recollection is that we had a single set point at 10 psi for the initiation of containment spray and containment isolation. During the construction permit review of that set point

9.2 by the NRC, which was then the AEC, it was determined that there may be certain situations in which containment isolation would be appropriate and yet the 10 psi set point would not be reached. The NRC, therefore, I believe, recommended that containment isolation occur upon initiation of any ECCS action. It is my recollection that Burns & Roe, who had been responsible for this system, and the utility, which I guess was some combination of Met Ed and Jersey Central at that time, determined that it would be preferable to simply change the set point to 4 psi from 10 psi for the purpose of containment isolation rather than add an additional signal to the reactor protection system.

Again, I point out that this system was the responsibility of the architect - engineer and of course the construction permit is the responsibility of the utility, and the only part that B&W played in all of this was the supply of certain pressure-temperature relationships as a result of transients occurring inside containment; therefore, B&W was not involved in the decision making but simply supplying some input, and the only reason I have any recollection at all is because I was involved in the licensing process in my position as manager of Safety Analysis.

Q At that same time, it is my recollection

that they not only changed the set point from 10 psi to 4 psi for the purpose of containment isolation but increased the set point for containment spray from 10 psi to 30 psi. I cannot recall any other discussions on that subject. I think that is the full extent of my knowledge at this point.

Q What was the basis for the initial set point of 10 psi; what factors were taken into account in arriving at that figure?

A It is my recollection that that set point arose from the judgment on the part of the architect - engineer for our first plant, namely the Oconee plant and the architect-engineer in that case was Duke Power Company, the utility, based on a spectrum of LOCAS from .5 square foot to the largest potential rupture. They wanted to keep the set point as high as possible to avoid spurious actuation and yet have it adequate for that spectrum of breaks, but again even in that case B&W only supplied temperature-pressure relationships. The decision was that of Duke Power Company.

Q Would .5 square foot to the largest potential rupture include small breaks?

A No, it would not.

Q Do you know whether the selection of the 10 psi figure which you have mentioned took any account

of the possible effects of small breaks?

A No, it did not.

Q Do you know whether the 4 psi figure that was ultimately identified at TMI 2 took any account of the potential effects of small breaks?

A I believe it did in the context of what we then considered to be small breaks which was probably in the order of .05 square foot.

Q How did the 4 psi set point take any account of small breaks on the order of .05 square foot?

A Again, I don't know how the decision was made. All that B&W did was supply the pressure-temperature relationship in containment for that size break.

Q And the selection of the figure was made by whom?

A I believe it was made by the architect-engineer in conjunction with the utility.

Q Would anyone from B&W have been a participant in the discussions or the analysis for the selection of the 4 psi figure itself?

A Probably, and if so, it would have been Mr. Parks, but I don't have that recollection; that would be hypothetical on my part to make that speculation.

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Q Do you know whether in the selection of containment isolation criteria for TMI 2 any consideration was given to containment isolation based upon radiation?

A I do not recall that being one of the parameters considered at that time.

Q You indicated that there was some consideration given to actuating containment isolation on initiation of any ECCS action, is that correct?

A The NRC made that suggestion.

Q Was that suggestion made based on a particular requirement that the NRC had in mind, or simply that they thought you ought to look at this as a basis for possible containment isolation?

A I cannot say the basis for which the NRC made that recommendation. However, it is a fact that one of our competitors had that as part of his design at that time.

Q Do you know why ECCS actuation as a basis for containment isolation was rejected?

A I do not know, but as I indicated before, or at least implied before, I believe that it was based on the judgment of the architect-engineer that they did not want to add an additional signal in the engineering

safeguard and protection system logic.

Q Do you have any understanding why an architect-engineer might be reluctant to add an additional signal?

A Only the reliability; in other words, the more signals one has, the more spurious actuations you are subject to.

Q Do you have any understanding of what costs would be involved in adding an additional containment isolation criterion?

A No, I have no idea of the cost, and I don't recall any discussion of cost at that time.

Q You indicated earlier that there was an effort to make the set point for containment isolation as high as possible to avoid spurious actuations. What is the concern in that regard?

A The concern was not in regard to the isolation function, I don't believe, but more in regard to the spray function which has chemical effects on many of the components within containment.

Q But containment isolation and the spray function are separable?

A They are separable now. At that point in time, they were a single signal.

Q That is simply a question of electronics

or wiring now?

A Yes, as far as I understand.

MR. EDGAR: Off the record.

(Discussion held off the record.)

(Continued on Page 47.)

sr/ew

Q Mr. Mallay, were you involved in the preparation of the PSAR for TMI 2?

A I do not recall specifically preparing the TMI 2 PSAR, but I presume from my responsibilities of that period of time I must have prepared at least a portion of it.

Q Would that preparation begin with a standard PSAR, which would have general applicability to the kind of design in use?

A It would have begun with the next previous PSAR.

Q And then that is reviewed and revised in the process of creating the PSAR for TMI 2?

A Yes, and in particular, the TMI 2 would have been more than just reviewed because we were at that time applying for a higher alternate power level than the previous plant, which I guess was Duke Power, or TMI 1, so there would have been a significant effort of upgrading, not just simply a review and minor revision.

MR. EDGAR: Off the record.

(There was discussion off the record.)

Q Mr. Mallay, were you involved in the B&W's work directed toward acquisition of a construction permit from the NRC for TMI 2?

A Yes, I was.

Q Can you describe what your involvement was?
A Primarily that of presenting the results of transient analyses to the NRC and ACRS and describing the bases for these analyses.
Q Had you done any transient analyses specifically with reference to TMI 2 in preparation for granting of that construction permit, do you know?
A As I indicated before, I cannot recall performing any analyses specifically for TMI 2, but I suspect I did, knowing my responsibilities at that point in time.
Q Were you involved at all with the preparation of the safety evaluation report?
A That is a report prepared by the NRC.
MR. EDGAR: What is your answer?
THE WITNESS: No. Excuse me.
Q Maybe you can tell me a little bit about what you understand of the preparation of the safety evaluation report and what its function and purpose is.
A My understanding is that the safety evaluation report is prepared by the NRC staff to summarize their safety review of a plant in preparation for the presentation to the ARCS.
I believe it may also provide a basis for the issuance of either the construction permit or the operating license, depending on the plant's status at

that point.

Q Is the SER made available for comments before it is finalized?

A I don't believe so.

Q Does the NRC ask questions or require additional information in the process of preparation of its safety evaluation report or does it work simply from the documents that it has before it?

A During the time period that we are talking about, namely 1965 to 1972, it is my recollection that the NRC never requested any assistance in the preparation of their safety evaluation report.

After that time there was some indication that the questions they were asking were the basis for what they were preparing from the SER, but that was only implication. To my knowledge this report was always prepared by them in secret, based on the information they had supplied to them at that point in time. They have always tried in my experience to keep the preparation of this report very close and very secret within their shop, and not let it be known that they were preparing such a report or what was going into it in any way.

Q Why would that be true, to your understanding?

A So that it would be completely their judgment. In other words, it would be a product solely of their review and, therefore, represents an independent safety review of the plant.

Q Were you involved at all in the preparation of the FSAR for TMI 2?

A I am quite sure I was not.

Q Were you involved in the work undertaken to prepare for obtaining the operating license at TMI 2?

A I don't know. If I knew the date on which it received its ACRS review for the operating license, I might be able to answer that question. But I do not recall specifically whether I was involved in helping them obtain the operating license. We had quite a few plants going through the time period during which I was manager of Licensing, and I cannot specifically recall TMI 2.

Q Mr. Mallay, are you familiar with the NRC Bulletin 79-05?

A Yes, I have read that bulletin.

Q Am I correct that among its recommendations or requirements is the requirement to have an automatic reactor trip in connection with a turbine trip?

A I cannot recall whether that was in that bulletin

or any subsequent one, namely 79-05-A or maybe even one subsequent to that. My recollection is not clear on that point.

Q Okay. Well, are you familiar that there was a requirement in one of these bulletins from the NRC that there would be an automatic reactor trip upon turbine trip?

A I don't believe it was that explicit.

(Continued on following page.)

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Q Would I be more accurate in referring to it as an "anticipatory reactor scram"?

A That would be more in conjunction with my recollection, yes.

Q In conjunction with loss of feed, turbine trip, or a significant reduction in steam generator level?

A Yes, that is closer to my recollection.

Q And as I check my notes I see also, I believe, the NRC was asking for a review as to whether such an anticipatory scram was appropriate?

A Yes, that would be my recollection also.

Q Do you have an opinion as to whether such an anticipatory scram under the conditions I indicated is appropriate?

A I believe the reactor trips supplied with the TMI 2 plant are adequate, and that this additional trip does not add any additional safety measures.

Q Is it fair to say that in a situation where you have a loss of feedwater, the likelihood of ultimately having a reactor trip, given the design of the system, is extremely high?

A If one loses all feedwater while operating at or near full power, I would anticipate a reactor trip to occur.

Q And we are referring at the moment to

13.2 loss of all feedwater from the primary feedwater system; we are not talking with reference to the auxiliary feedwater?

A Yes, I am talking about the main feedwater supply.

Q And the chances, when you have a loss of all feed on the secondary side of that, leading to a reactor trip or scram is very high, is it not?

A That is correct.

Q Approaching 100 percent?

A That is correct.

Q In those circumstances, why not have an anticipatory scram or trip on the primary side?

A One has to look at what one is trying to protect, namely the reactor core. One is looking for limits on fuel melting, defects in the clad, or unacceptably high reactor coolant pressure. If the trip system already protects these limits and others similar to that, there is no reason to add additional trips that would reduce the reliability of the plant.

Q The anticipatory scram would give an additional protection in the sense of giving additional time, is that correct?

A It may add time in the order of three to four seconds. In my opinion, if that is the case, that would not be of significance to me unless it also

prevented some major transient occurring that exercised systems unnecessarily, in terms of pressure or temperature.

Q Does that time interval that you have referred to -- three or four seconds -- have any effect on the margins built into the system, safety margins?

A Safety margins are those which are provided by the reactor trip system, which protect against temperature and pressure and other effects, that protect the reactor coolant system and its core. I don't know that the safety margins themselves would be affected by this difference in time.

Q If you view the amount of water in the steam generator as a safety margin, the water available in the steam generator at a particular point in time as a safety margin -- let me ask you, did you view it as such?

A Not necessarily.

Q The water in the steam generator is essentially the mechanism by which your heat sink operates, is that correct?

A That is correct.

Q And the capacity of your heat sink represents a safety margin to some extent, doesn't it?

A It depends on what one means by the safety margin. Again I regard the safety margin as those limits needed to protect the core and its reactor coolant system.

The philosophy in setting up any reactor protection system is to maintain these safety margins, recognizing the kind of water inventory one has on both the primary and secondary side and other characteristics of the plant.

I don't look at water inventory in any particular part of the plant as a safety margin per se.

Q Water inventory in the steam generator, where you have total loss of feed, relates directly, doesn't it, to the amount of heat that can be removed from the core in the ensuing seconds or minutes?

A Yes, that is true.

Q Would the three or four seconds' margin that we are talking about have any effect on the water inventory in the steam generator?

A Yes, it certainly would because one would have to remove heat during that time period.

Q To the extent that the B&W design leads, in the setting of a total loss of feed, leads to a boiling dry of the steam generator, would it be fair to say that the design on the primary side, where the set point for the PORV is at something around

2300 pounds -- is that correct?

A I don't recall the set point. It is 2300 or 2350.

Q Would it be fair to say in these circumstances that the design essentially looks to the PORV as a backup heat sink conceptually?

MR. EDGAR: Do you understand the question?

THE WITNESS: I am not sure.

MR. EDGAR: Ask for clarification.

(Witness conferred with counsel.)

A Yes, I really don't quite understand the question, so I will have to ask for a clarification.

Q Where you have a total loss of feed, and where the steam generator boils dry, you then have a loss of heat sink, correct, assuming auxiliary feed comes into play?

A That is correct. That would be true of any plant.

Q At that point, in terms of the design on the primary side, where do you go for heat sink?

A Well, heat sink I will define as something which creates a decrease in temperature. There is no heat sink at that point of any significance. One can relieve pressure by opening valves -- PORV,

safety valves and so on -- but depending on what is going on in the core, that won't necessarily reduce temperature.

Q Well, clearly the pressure that rises in the primary system is a direct function of the heat generated?

A Yes, it is.

Q Conceptually speaking, you are talking about a heat sink.

A Well, okay. It is a relief of energy in any event.

Q Yes.

A An energy sink.

Q Okay, and given the B&W design, the next energy sink available after the loss of the steam generator as an energy sink would be the PORV, is that correct?

A That is correct. And to my knowledge, probably correct if any.

Q Is there a definition, a commonly accepted definition in the nuclear power plant industry of what is known as safety equipment?

A Yes, there is.

Q Can you tell me what it is?

A I cannot cite you the definition, but I can

cite you the reference.

Q Yes.

A Yes, I think I understand that.

Q Cite me the reference and give me your understanding.

A The reference would be any Safety Class 1, 2 or 3 equipment, as defined by ANSI Standard 18.2 and ANSI 18.2A. My understanding would be that equipment which is required to safely permit the plant to be safely shut down and maintained in a safe shutdown condition.

Q In the case of a total loss of feed, is the PORV necessary to bring the plant to a safe shutdown condition, in your view?

A No, it is not.

Q What is necessary?

A The safety valves and probably the auxiliary feedwater system.

Q We define total loss of feed as including the auxiliary feed, as well as main feed.

A I see.

Q What would be necessary to bring the plant to a safe shutdown condition?

A Safety valves, and high-pressure injection system, and eventually low-pressure injection system.

Q Would the safety valves be reached on a primary side without the PORV opening?

A Yes.

Q They would?

A Yes.

Q The code safety valves would lift on the primary side without any opening of the PORV?

A Yes.

Q And therefore, the PORV would never become involved, would never come into action in such a circumstance?

A Well, the set points for the safety valves, of course, are at least 100 psi above the PORV. I assumed your question was based on the fact that the PORV did not open.

Q No.

A Not that it was not actuated.

MR. EDGAR: That was my understanding.

THE WITNESS: I thought it was quite clear from your question.

Q Let me restate it. You indicated that the code safeties are necessary when you have a total loss of main and auxiliary feed?

A Yes, they are.

Q To bring the plant to safe shutdown condition?

A Yes, they are. They are the design function. The PORV is not a design function. It is not a safety class piece of equipment.

Q But would the code safeties come into play and lift from their seats without the PORV ever having come into play in those circumstances?

A Okay. That is a different question.

Q Consider that a clarification of the question.

A If the PORV actuated as designed, the safety valves would not be expected to open.

Q Or if the safety valves did open and the PORV functioned as designed, it also would have opened?

A That is correct.

Q At a point earlier in time?

A Prior to when the safety valves opened, that is correct.

Q Because of the relative set points on the code safeties and the PORV?

A That is correct.

Q So would it be accurate to say that to the extent the code safeties are necessary for a safe plant shutdown, and to the extent that the code safeties and the PORV functioned as designed and as

intended, that the PORV would necessarily come into play, would necessarily lift?

A Yes, it would.

Q Would it also be fair to say that to the extent a PORV now functions, one has a small break LOCA, that it malfunctions open?

A If it is actuated and malfunctions in the open condition and the block valve associated with it also not closed, yes, we would have a small break.

Q Now, the definition of safety equipment, as I understand it, is a definition created by the NRC?

A No, it was created by the industry.

Q Has the NRC adopted it by reference, the industry definition?

A No, I don't believe they have.

Q It is just an industry standard?

A Yes. There is a tacit acceptance of it by virtue of the fact that almost all FSAR's submitted by all four major reactor vendors in the United States use this system.

Q So if I understand correctly, we have a situation, assuming the primary side of a plant is functioning as intended, and assuming a total loss of the main and auxiliary feed, there is a situation where, in order to bring the plant to a safe shutdown

condition, the PORV will necessarily lift from its seat?

A It is not necessary that it open, but if it actuates properly, it will open.

Q My question is, assuming that all valves function as intended, and assume the code safeties are necessary to bring the plant to a safe shutdown condition where there is total loss of feed, then the PORV's will necessarily have opened by the time the code safeties come into play?

A That is correct.

Q And it is also fair to state, is it, that the code safety valves represent a penetration of the reactor vessel; that is its function, correct?

A Yes.

Q And that a failure of it in the open position would establish a small break LOCA?

A Yes, the failure of a code safety valve in the open position.

Q The PORV in the open position would establish a small break LOCA?

A Yes, under the conditions I specified earlier.

Q Yes, and yet it is my understanding that at least under the industry standards to which we have had reference earlier, this PORV which, at least

under these circumstances must necessarily come into play if the primary systems are functioning as designed, is not regarded as being within the class of safety equipment?

A That is correct because it does not have to open. It is not a safety function that it opens.

Q I understand that it does not have to open, but the normal expectation would be that it would open?

A Yes, that is correct.

Q Does it raise a question in your mind where you have a system that must necessarily come into play, assuming that it is functioning as intended in the safe shutdown of the plant, that it is not defined as part of the safety system?

A No, as long as it can be isolated.

Q Would it be fair to say that the analysis which leads to the conclusion that the PORV is not a part of safety system instruments, the PORV from the perspective that it is not necessary for it to function, i.e., it is not necessary for it to open for safe plant shutdown, is that correct?

A That is correct. It does not have to actuate into the open condition in order for safe operation or shutdown.

Q But the definition apparently does

not proceed from the perspective that when PORV is called into play that a failure of the PORV in the open position and/or failure of operators to block that valve, should it remain in an open position, is not taken into account?

A Yes, it is taken into account. The safety analysis --

Q I am referring now to the perspective of the definition in the industry standards.

A Yes, I am using the same perspective; that the perspective is that one has to assume an initiating event and a single failure.

Q So we are bounded?

A Yes.

Q Is that correct, by the assumption of a single falure?

A Yes.

MR. EDGAR: The initial conditions you are giving are conditions representative of a single failure, total loss of feed?

THE WITNESS: The context of the question is that we have a failure, namely the loss of main feedwater, and a single failure, namely loss of the auxiliary feedwater. It is therefore assumed that the PORV is isolable.

Q To the best of your understanding, has a transient analysis and various other kinds of analyses with regard to safety systems generally proceeded over the years, at least up to now, on a single failure mode, in a single-mode framework?

A That is true,but it goes beyond that. It goes to the extent of assuming consequential failures as a consequence of the accident.

In other words, if it creates conditions where other failures occur, then these consequential failures must also be assumed. It is also assumed that if it makes the accident worse, there is loss of power, for example, so it is not simply a single failure, but it is in the context of this single failure conceptually.

Q Conceptually it is these consequences which necessarily follow?

A Yes.

Q From the single failure?

A Correct.

Q And does not incorporate consequences which may follow but don't necessarily follow?

A That is correct. Simply because most people view that type of scenario as involving so many combinations as to not be trackable.

(A brief recess was taken.)

MR. EDGAR: Jim is a little concerned about some of the level of questioning, in that the inference might be drawn that he is current and up-to-date as an expert, and he may want to make a statement addressing that point. I mean you are taking a guy that has been away from this stuff for a while and asking him questions where his knowledge is rather limited and tangential.

MR. ROCKWELL: Mr. Mallay seems to have a perfectly clear conceptual grasp of the subject.

MR. EDGAR: I am not belittling his ability at all, but he has advised me he would like to say a few words in that respect, if that would be proper, for this record.

Q Mr. Mallay, you are welcome to make any statement you wish.

A Yes. I believe some of the questioning here is in regard to this specific transient, namely, small breaks and loss of feedwater, with the implication that I have current knowledge of such transients. I cannot claim such current knowledge, although in the past I had dealt with many of these

areas. Although I fully stand behind all of the answers I have given you, I do want the answers properly in the context of my non-familiarity with current technology.

Q For the record, my questions really were directed to conceptual issues relating to fundamental design, rather than specific transients.

Mr. Mallay, with respect to operating and emergency procedures in use at the operating utilities, is it your understanding that those procedures do go through a review process, so that they reflect B&W thinking with respect to the appropriate use of its design on the NSS side of the system?

A I am not familiar with how procedures and so on are prepared for the utility, but to the best of my understanding, the procedures themselves are prepared by the utility.

B&W makes certain recommendations on the operation of its equipment in order to protect its warranties. However, procedures regarding operation of the plant itself are supplied to the utility only upon its request, and it is my understanding that these procedures then are actually written by the utility based on B&W input.

Q But the input provided by B&W, to your

understanding, would represent the current best thinking of B&W at the time the input is provided?

A I would certainly hope so.

Q Mr. Mallay, have you made any statement since March 28, 1979 relating to your knowledge or understanding of any of the events surrounding TMI 2 or related to your knowledge or understanding of any of the events surrounding the Dunn memorandum, and when I say "a statement," I mean anything that you have reduced to writing or anything which has been reduced to writing by someone else based on what you said?

A One further clarification. All these exhibits that you have shown me I had not had any prior knowledge of, so we can take that completely out of the question.

Q Fine.

A There is at least one piece of information that has been reduced to writing based on my knowledge of the TMI 2 accident and the safety design of TMI 2, and that is a report that I prepared for BBR, Babcock Brown Boveri reactor.

Q And what was the substance of that report?

A The substance of the report was to summarize the sequence of events, to speculate on why some of

the events occurred, and to point out the design philosophy of TMI 2 with regard to the Muelheim-Kaerlich plant being built by BBR.

Q When was that report written?

A I prepared the report and had it published on May 12th of this year.

Q How long is it?

A It is approximately 300 pages.

Q Did you write the entire report?

A Yes, I did.

(There was discussion off the record.)

MR. ROCKWELL: Could we have a copy of that, please?

MR. EDGAR: We will produce it.

(There was discussion off the record.)

Q Are there any other statements, as I have defined the term "statement," that you have made since the TMI 2 accident of March 28, 1979?

A Yes, I believe so, within the context of your question. I have conducted two meetings that come to mind as Chairman of the Nuclear Power Plant Standards Committee, in which I have indicated certain actions I thought were appropriate within the standards organization to be taken as a result of the TMI 2 accident. I have not made any statements in these

meetings regarding the course of the accident itself or its cause or anything in that regard, only statements in regard to what is in the public literature and what might be the impact of the accident.

Q Was your summary of actions that might be appropriate reduced to writing in some way?

A Yes, there are minutes of both meetings.

Q Could we have minutes of those, too?

A Yes.

Q Anything else, Mr. Mallay?

A External to B&W or internal?

Q Either.

A Yes, there is one other piece of information. I prepared a memo to Russ Ball, again recommending certain actions be taken by B&W as a result of the TMI 2 accident.

Q Mr. Ball is the head of the technical --

MR. EDGAR: This was in the context of the Technical Review Committee report?

THE WITNESS: Yes.

MR. ROCKWELL: Could we have a copy of that, as well?

MR. EDGAR: Off the record.

(There was discussion off the record.)

Q Mr. Ball is head of the Technical Review group?

A That is correct.

Q I would like to clarify the previous request that I made for the final product of the Technical Review group. We asked for the report. We are interested in seeing all of the working papers from which the report was drafted. While we had been off the record, I have been given the understanding that at least the present intention or present structure of the report will include as an appendix all of the working papers submitted to the Technical Review group from which the report is written.

When that report is furnished to us, we would request that the appendix be furnished. At the same time, if the plan is changed and such appendix is not attached, we would still request all working papers.

MR. EDGAR: Yes.

Q Mr. Mallay, are there any other statements that you have made, other than the ones we have now reviewed?

A Not that I currently recall.

Q You haven't been interviewed by the NRC?

A I have not been interviewed by the NRC.

Q Or given any testimony?

A I have not given any testimony before anybody.

MR. EDGAR: I would like to ask a few questions if I might.

MR. ROCKWELL: All right.

CROSS EXAMINATION

BY MR. EDGAR:

Q Mr. Mallay, earlier on you indicated that when you were working in transient analysis or safety analysis, there were no calculations performed on the actual transients. What was the base of operating experience at the time that you were doing that work?

A At the time I was doing the work, there were only a few reactors operating -- Con Ed, Dresden, Shippingsport, one of the Yankee reactors in the commercial vein.

Q Were there any B&W reactors from which meaningful transient analysis could be performed?

A The only operating B&W reactor was Indian Point 1, and to my knowledge, there were no transients that were worthwhile in terms of benchmarking.

Q Are you familiar with current practices within B&W today as to benchmarking?

A No, I'm not.

Q Are you familiar with the arrangements that B&W has had with each of its utility customers

with respect to preparation of operating and emergency procedures?

A No, I am not.

Q In particular, are you familiar with the arrangements on TMI 2?

A No, I am not.

Q Are you familiar with the details of the existing procedure for preliminary safety concerns within B&W?

A I do not have detailed knowledge of it. However, I am familiar with the fact that it is posted on several of our bulletin boards here.

MR. EDGAR: That is all I have.

MR. ROCKWELL: Can I have a copy of what is presently posted on bulletin boards here?

MR. EDGAR: Sure.

REDIRECT EXAMINATION

BY MR. ROCKWELL:

Q Mr. Mallay, who was the person who took over the Licensing Section when you departed in 1975?

A Mr. Suhrke.

Q And did he remain as manager of the section until Mr. Taylor took over?

A That is correct.

Q Was he acting manager or was he manager?

A No, he was the manager. He was appointed as manager of Licensing.

MR. ROCKWELL: Mr. Mallay, we will recess your deposition now, and we are recessing it rather than adjourning it, so that we may recall you for further testimony should the need arise. We would advise your counsel, and he in turn would advise you, if we need such additional testimony.

Thank you.

MR. EDGAR: Do you have any present intention of calling him for additional testimony?

MR. ROCKWELL: We don't have any present intention, but that doesn't preclude that we may develop a present intention in the future or a future intention in the present.

(The deposition recessed at 11:00 a.m.)

_____
James Francis Mallay

Subscribed and sworn to
before me this ___ day
of _____ 1979.

_____
Notary Public

I-N-D-E-X

Witness	Direct	Cross	Redirect
James Francis Mallay	3	71	72

E-X-H-I-B-I-T-S

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

We, STANLEY RUDBARG, Certified Shorthand Reporter and Notary Public, and ROBERT ZERKIN, Notary Public, of the State of New York, do hereby certify that the foregoing deposition of BABCOCK & WILCOX by JAMES FRANCIS MALLAY was taken before us on the 7th day of July 1979.

The said witness was duly sworn before the commencement of his testimony. 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 7th day of July 1979.

Stanley Rudbarg
STANLEY RUDBARG, CSR.

Robert Zerkin
ROBERT ZERKIN

James F. Mallay Born: December 8, 1936, Morristown, N.J.

EXPERIENCE

8/77 - Present	Program Manager, BBR. Responsible for the marketing and project management of engineering services to BBR, a partly-owned German Company of B&W.
5/75 - 7/77	Manager, Liquid Metal Fast Breeder Reactor Components. Responsible for the design and analysis of all breeder components at the Babcock & Wilcox Company, Akron, Ohio.
8/71 - 4/75	Manager, Licensing, B&W. Responsible for all nuclear power plant licensing activities with the NRC, public hearing boards, and customers, including the preparation of licensing reports and strategy, representing B&W before regulatory agencies, and interpreting regulations.
6/69 - 7/71	Manager, Safety Analysis in the Nuclear Power Generation Division of B&W in Lynchburg, Virginia. Responsible for all accident analysis and radiation protection analysis for all nuclear power plants.
4/65 - 5/69	Lead Engineer in Safety Analysis.
9/67 - 6/71	Lecturer in the Graduate School of Lynchburg College, VA in Reactor Control Theory and Reactor Physics (concurrent with the B&W assignment).
4/62 - 3/65	United States Army, attaining the rank of Captain. Served in the capacity of research nuclear physicist.
9/61 - 3/62	Engineer in Operational Analysis Section in the Atomic Energy Division of B&W, Lynchburg, Virginia.

EDUCATION

9/55 - 6/59	Bachelor of Science in Mechanical Engineering, Magna Cum Laude, with honors, at Lafayette College, Easton, Pennsylvania.
9/59 - 6/61	Master of Science in Nuclear Engineering at Massachusetts Institute of Technology, Cambridge, Massachusetts under a National Science Foundation Fellowship.

MEMBERSHIPS

American Nuclear Society
American Society of Mechanical Engineers
Tau Beta Pi
Phi Beta Kappa
Registered Professional Engineer in Ohio and Virginia
American Men of Science

MALLAY DEP

EXHIBIT 7
FOR IDENTIFICATION
L.M. BENJAMIN

POOR ORIGINAL