ORIGINAL

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

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

Plaintiffs,

-against-

80 Civil 1683 (R.O.)

THE BABCOCK & WILCOX COMPANY and J. RAY McDERMOTT & CO., INC.,

Defendants.

Continued deposition of THE BABCOK & WILCOX COMPANY by BERT MERRIT DUNN, taken by the Plaintiffs pursuant to adjournment, at the offices of Kaye, Scholer, Fierman, Hays & Handler, Esqs., 425 Park Avenue, New York, New York, on Wednesday, September 15, 1982 at 10:00 o'clock in the forenoon, before Catherine Cook, a Shorthand Reporter and Notary Public within and for the State of New York.

Appearances:

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BY: ROBERT B. FISKE, ESQ.
and
RODMAN W. BENEDICT, ESQ.,
of Counsel

ALSO PRESENT:

DAVID TAYLOR

oOo

B E R T M E R R I T D U N N, having been previously sworn, resumed and testified further as follows:

EXAMINATION (Continued)

BY MR. SELTZER:

Q Since the last session of your deposition, has your position at B&W changed any?

A Yes.

Q What positions have you held, in chronological sequence, since the last session of your deposition in this case?

A The last position I held was that of unit manager of ECCS analysis, and I presently hold a position of unit manager of fluid and transient analysis.

Q Were there any intermediate positions?

A No.

Q Is there still an ECCS analysis unit?

A No.

Q What units or unit have taken over the responsibilities that were previously handled by the ECCS analysis unit?

A The responsibilities of the ECCS analysis unit as they existed during the last deposition have been wholly taken over by the fluid transient analysis unit.

Q Did most of the personnel who had been assigned to the ECCS analysis unit get assigned to the fluid and transient analysis unit?

A All of the personnel that had been assigned to the ECCS analysis unit were assigned to the fluid and transient analysis unit, that's correct.

Q Does the new unit have responsibilities that extend beyond the scope of the former ECCS analysis unit?

A Yes.

Q What are the additional responsibilities?

A The unit is responsible for all accident analysis performed in support of nuclear power plant licensing,and for performing analyses not in support of licensing but which would require the techniques embodied in licensing type of analysis.

Q Are there any other responsibilities that are handled by your new unit? If so, what are they?

A The remaining responsibilities are on the order of administrative responsibilities, documentation responsibilities.

Q In what areas?

A In the areas associated within which we perform analyses.

Q Danny LaBelle used to head a unit called

safety analysis. What unit today embraces the responsibilities that used to be handled by the safety analysis unit?

A There are two units that embrace those responsibilities. They are the fluid and transient analysis unit,and a unit headed by Dr. Joe Cudlin and for which I can't recall the current name.

Q What is its area?

A Its primary area of responsibility is the creation and modification of computer codes for use by other units within B&W.

Q Does that mean that if the craft code was going to be modified by transient analyses, it would be done by Cudlin's unit?

A In part.

Q What part?

A The formulation of the alteration of the code and the first checking of the alteration for performance would be performed by Dr. Cudlin's unit.

Q What section is your fluid and transient analysis in?

A The fluid and transient analysis unit is in the performance analysis section.

Q Who is the head of performance analysis?

A Mr. Jim Mallay.

Q What other units are in the performance analysis section?

A Operational analysis and Dr. Cudlin's unit.

Q What does operational analysis do?

A Operational analysis performs evaluations of control systems for power plants and the results of expected transients which would not be termed accidents.

Q What are accidents of expected transients which are not considered accidents?

A One example would be a controlled shutdown. Another example would be a turbine trip, an upset in the feedwater chain that would be less severe than a loss of feedwater but a change in flow.

Q If it were a complete loss of feedwater, is that analysis something that would be done in your unit?

A The complete loss of feedwater could be done in either unit. The variation would depend on manpower availability.

Q Is there no longer a plant design section?

A There is no longer a plant design section as it existed at the time of the previous deposition. I do not believe there is a section entitled plant design any longer, either.

Q What, if you know, are Dr. Womack's responsibilities?

A Dr. Womack is a business segment manager in charge of the customer service area and special products and training, and those are the parts I know. There may be some additional areas of responsibility.

Q Does the Lynchburg training department ultimately report to Allen Womack?

A That is my understanding.

Q Is Norm Elliott still in charge of training?

A To the last of my knowledge, yes.

MR. SELTZER: Instead of pressing this on much further, we will send you whatever the latest organization chart is that we have for the organization people at Three Mile Island.

MR. BENEDICT: Why don't you include GPU Nuclear and -- basically the people who we have had as witnesses in your depositions and were there.

MR. SELTZER: Parsippany people. And you will send us yours.

Q Where is Don Roy?

A Don Roy is a business segment manager in charge of the engineering department, the backlog project management department and the service project management

product department.

Q Who is the head of the engineering department?

A Mr. Greg Glie.

Q Where is Bruce Karrasch?

A Bruce Karrasch is in charge of the operating plant project managers.

MR. SELTZER: I would like to mark for identification as GPU Exhibit 611 a stack of documents produced from B&W's files with the tab 205 Fuel Assembly Small Break 32-7743-0.

(Stack of documents with tab reading 205 Fuel Assembly Small Break 32-7743-0 marked GPU Exhibit 611 for identification, as of this date.)

Q Take a look at GPU 611 and after you have had a chance to look at it, could you identify what it is, please.

A This exhibit is a calculational file documenting calculations performed in support of B&W 205 plant.

Q Do the calculations in this file relate to any particular area of analysis in support of 205 plant licensing, such as small break loss of coolant accident?

A Yes. The calculations performed are the

results of small break situations.

Q Small break means a small loss of coolant accident?

A Yes.

Q Would you turn to the fourth page of the exhibits, numbered 301 in the lower right-hand corner. There is a date in the upper right-hand corner, a handwritten date at the top third of the page, May 5, 1980. Do you see that?

A Yes.

Q That is a date when this calculation file of documents was assembled, is that right?

A No.

Q What does that refer to?

A That is the date that Mr. Bob Jones signed this page.

Q It is correct, isn't it, that the materials that are contained in this file were prepared over a period of more than a year prior to May 1980?

A I do not know the period over which the materials for this file were prepared.

Q Take a look at sheet 6 on page 306. Do you see the heading on that page 205 FA small break analysis run category prior to TMI-2 incident on 3/28/79?

A Yes.

Q Do you see on the next succeeding page there is a Nehru Shah calculation sheet dated February 1, 1978, page 307?

A No.

Q Whose initials are NHS at the bottom left-hand side of the page?

MR. BENEDICT: It is obliterated on this copy.

Q I show you this copy.

A Yes, I see the initials NHS.

Q Is that Nehru Shah, to the best of your knowledge?

A Yes.

Q That would indicate that the calculation work set forth on that page was done on or about February 1, 1978 -- on or before February 1, 1978?

A Yes.

Q What, as you understand it as the former head of the ECC analysis unit,was the purpose of assembling a calculations file such as GPU 611?

A B&W requires that documentation be provided of all work performed to determine the design of one of its products or to determine the performance of its

products for the purposes of licensing. The files, calculation files, are a primary way of recording that documentation.

Q Does your present unit keep within its area calculation files that would include this particular calculation file?

A The unit has the practice of keeping its calculational files, yes.

Q Do you and other engineers in the unit from time to time refer to the prior calc files?

A Yes.

Q At the time that the ECCS analysis unit was working on the problem of secondary sidewater level in the 205 plant steam generators,you were familiar with that work, weren't you?

A To a degree.

Q That analysis is part of what is documented in the calculation file that you have in front of you, right?

If you would like to refresh your recollection, I call your attention to page 306.

A This calculational file is part of the work performed to determine the -- or rather a secondary sidewater level for the Babcock 205 plant.

Q Prior to the work that went into this calculation file, B&W had filed a topical report covering small break loss of coolant accidents for its 205 plants, isn't that so?

A Yes.

Q You worked on that topical report, right?

A I would need to look at the topical report to determine that.

MR. BENEDICT: I don't see how the topical report is relevant to the calc files which we have agreed to go over. The topical report may or may not be relevant but it is not part of the calc files and that is what we are here to talk about.

MR. SELTZER: Would you show the witness GPU 473.

Q 473 is referred to on page 2 of the calc file and I believe it is the starting point for the re-evaluations that are covered in this calc file.

MR. BENEDICT: To the extent that you are going to ask Mr. Dunn about the calc file, I don't disagree. BAW 10047-A is something you had.

MR. SELTZER: The calc file talks about a problem that was discovered with the loss of coolant accident analysis contained in the earlier

topical report. I want to get into today what those problems were, how the calculations were done, analyze those problems and how that that problem was resolved.

I don't think you can talk about what the problem is until you know what the vehicle of the problem is.

MR. BENEDICT: I am not objecting to a question, yet, Mr. Seltzer. If I see you are not going beyond the calculation file, then we both will be happy.

MR. SELTZER: I certainly want to make sure that you are happy.

Q Was GPU Exhibit 473 the B&W topical report relating to loss of coolant accidents in 205 plants?

A Yes.

Q You were a principal author of it?

A I was a co-author.

Q That topical report was submitted in support of licensing of B&W's 205 fuel assembly plants, correct?

A It was submitted in support of the construction permit stage of licensing.

Q For the 205 plants?

A Yes.

Q That topical report, GPU Exhibit 473, was based on a 40-foot level for secondary sidewater in the steam generators, correct?

A Yes.

Q B&W I take it had done transient analyses to verify with the steam generator filled to a 40-foot level, if there were small break loss of coolant accident, there would be effective core cooling within the criteria of 10 CFR 50.46 and Appendix K, right?

A That's correct.

Q In early 1978, and I am getting now to what becomes the subject of the calculation files materials, B&W determined that there were something they called overfill problems if a 40-foot level was maintained in the steam generator, isn't that right?

A I don't know.

Q You do know, don't you, that after March or April 1978, your unit began to do calculations to determine whether a 6-foot level in the steam generators could effectively cool the core to the standards prescribed by the NRC, right?

A Yes.

Q To refresh your recollection that it was an overfill problem that led to the calculations associated

with the 6-foot level, I would like to mark for identification as GPU Exhibit 612 a memo from your right-hand man Bob Jones to S. J. Engel, with a copy to you; subject, auxiliary feedwater steam generator or overfill problem. It is dated March 14, 1977.

(Memo dated March 14, 1977, from Bob Jones to S. J. Engel, marked GPU Exhibit 612 for identification, as of this date.)

Q Does GPU 612 refresh your recollection that the catalyst for doing calculations of a 6-foot level in the steam generators was concern over an overfill problem if a 40-foot level were maintained in the steam generators?

A Not enough.

Q You said that you were aware that calculations were done to analyze a 6-foot level in the 205 plant steam generators. I take it those calculations were done to determine whether with a 6-foot level in the steam generators, there would be effective core cooling, right?

A That's correct.

Q I take it those additional calculations needed to be done because as of early 1978 there was no existing set of calculations within B&W that could

demonstrate that a 6-foot level control was acceptable for mitigating small break loss of coolant accidents, right?

MR. FISKE: You are talking about 205 plants in all these questions?

MR. SELTZER: Yes, that is my understanding.

Q You were aware that by 1978 B&W had already shipped steam generators for certain 205 plants, right?

A I was not aware one way or the other.

Let me rephrase that. I don't know whether I was aware.

Q Today you don't recall being aware, is that correct?

A Right.

Q Nehru Shah was in your unit in 1978, right?

A Yes.

Q He was in Bob Jones' group?

A I don't know.

Q Do you recall that Shah was the one who performed a lot of the calculations to determine whether there could be effective handling of the consequences of a small break loss of coolant accident if there were a 6-foot level in the steam generators?

A No, I don't recall.

Q Let me show you a memorandum from Shah to Roy with a copy to you, dated March 30, 1978; subject, status of 205 fuel assembly small break LOCA analysis.

MR. SELTZER: We will mark that GPU Exhibit 613.

(Memorandum dated March 30, 1978, from Mr. Shah to Dr. Roy, marked GPU Exhibit 613 for identification, as of this date.)

Q I would also like to call your attention in the calculation file which is in front of you to pages 109 through 116.

MR. BENEDICT: You are now switching over to the actual pages in the calc files as opposed to the microfilm numbers. You used them before.

Q It is correct, isn't it, that it was Nehru Shah who did the calculations to determine whether there could be effective core cooling with a 6-foot level in the steam generator?

A I don't know.

Q From your familiarity with B&W's files, how they keep calc files, how people indicate their authorship of sections of the calculation files, from Shah's memo to you dated March 30, is it your understanding that Shah was directly involved in that

analysis?

MR. BENEDICT: What are you asking him to do other than read the initials at the bottom of the page?

MR. SELTZER: If that is sufficient for him to answer the question, fine.

MR. BENEDICT: The document says what it says. I am trying to differentiate between your asking him something we can all read and where the witness has some special knowledge.

MR. SELTZER: That he can say that Nehru Shah did these calculations. He doesn't have to have a vivid memory about looking at documents which confirm it.

MR. BENEDICT: If this refreshes his recollection, that is fine.

MR. SELTZER: This is fine, and if you want to do it again, you can do it again. I think it creates an unsavory image to see you trying to direct or instruct witnesses that they shouldn't say something that I think is fairly obvious. There are initials on the bottom that Mr. Dunn probably recognizes are Shah's initials. There are dates that show it. There are complex

calculations here that he may be able to identify or calculations to a 6-foot level that I could identify. I don't think it is so obvious and --

MR. BENEDICT: You just said it is obvious.

MR. SELTZER: I think it is particularly within his ken to say yes, from this it certainly appears Shah did the work.

MR. BENEDICT: I think what you are talking about is whether Mr. Dunn remembers, with his recollection refreshed, that Mr. Shah did these calculations, or are you asking him to say that it is a logical conclusion from reading these documents that Mr. Shah did it. We can all draw the logical conclusion. I think the only fair question is what he remembers himself. I don't think it is a life or death issue.

MR. SELTZER: I appreciate that, too. I think to ask him to draw the logical conclusion is also not wholly inappropriate, since he is the one who lives with these files day in and day out.

BY MR. SELTZER:

Q Can you tell from looking at these whether Nehru Shah was somebody who was directly involved in determining whether there could be effective mitigation

of small break accidents with a 6-foot level in the steam generators?

A Yes.

Q What is the answer?

A Yes.

Q Yes, he was?

A Directly involved.

Q The analyses that were done of the 6-foot level demonstrated that for certain size loss of coolant accidents, there would be uncovery of the core, right?

MR. GENEDICT: Is that what you remember, Mr. Dunn?

A Yes.

Q In fact, the uncovery was so substantial and so sustained that your unit concluded that B&W could not satisfy the NRC criteria for effective core cooling with a 6-foot level in the steam generators, isn't that so?

MR. FISKE: You mean for those sizes?

A I don't know.

MR. SELTZER: I would like to mark as GPU 614 a memo from Bob Jones to you; subject, March activities report, dated March 30, 1978.

(Memo from Bob Jones to Mr. Dunn, dated March 30, 1978, marked GPU Exhibit 614 for

identification, as of this date.)

Q Is GPU 614 a copy of a monthly status report that Bob Jones sent to you at or about the end of March 1978?

A Yes.

Q Do you see under Section 1.1 his description of work analyzing the 6-foot level in the 205 plant steam generators?

A Yes.

Q I take it it is your understanding that this is the same problem and the same analysis that Nehru Shah worked on and that is documented in the calculation file that is in front of you?

MR. BENEDICT: Can I hear that again, please?

You are asking him to read this today and interpret it and look at the calc file?

Let's take a break.

(Recess taken.)

A I can't base that on recollection.

Q Looking at the monthly report which you got from Bob Jones, which refers to an analysis out to time T equals approximately 2600 seconds and the calc file at pages 115 and 116, don't those pages show you that what Nehru Shah has calculated there, showing uncovery down

to 6-foot level at 2600 seconds, corresponds to the material that Jones is describing on the first page of GPU 614?

MR. FISKE: If you are asking Mr. Dunn whether the calculation that he is now looking at did show that the 6-foot level was inadequate to keep the core covered, I have no objection to that.

Q Do you understand what Mr. Fiske just said?

A Yes.

Q 6-foot level doesn't keep the core covered, does it?

A A 6-foot mixture level does not keep the core covered. The "Yes" I reiterated a few moments ago was in reference to understanding Mr. Fiske. It was not in answer to your question.

Q You knew as a result of Nehru Shah's analysis showing uncovery down to a 6-foot level in the core, that for certain small break loss of coolant accidents, a 6-foot steam generator level would produce unacceptably high peak clad temperatures, right?

A No.

Q You knew that one of the five criteria for effective core cooling in 10 CFR 50.46 was the maintenance of peak clad temperatures below 2200 degrees

Fahrenheit, right?

A Yes.

Q You knew as a result of the Nehru Shah analyses of the 6-foot level in the steam generator that there were certain small break loss of coolant accidents for which peak clad temperature would exceed 2200 degrees, isn't that right?

MR. BENEDICT: Are you asking if he knew it then and remembers knowing it then?

MR. SELTZER: Sure. He can read in Jones' report right here that that is what it says.

MR. BENEDICT: That is not what we are talking about. We are talking about what Mr. Dunn remembers.

So what you remember, Mr. Dunn, is what you remember, not what you read in the memo.

A I don't know whether I knew that or not.

Q And looking at Jones' memo -- withdrawn.

Jones says to you in the second paragraph, "It is improbable that the peak cladding temperature would be less than 2200 Fahrenheit." Do you see that?

A Yes.

Q Are you saying that does not refresh your recollection that the Shah analysis showed peak clad

temperatures going above 2200 degrees Fahrenheit?

A That's correct.

Q Take a look at page 6 of GPU Exhibit 613, that is Shah's memo to Roy, copy to Dunn. Do you see the section headed Recommendation?

A Yes.

Q The first sentence there states, "The present results for a discharge breaker not acceptable in comparison to the BAW-10074A small break analysis results or by 10 CFR 50.46."

Do you recall that there came a point in time in or about the spring of 1978 when you knew that the results of analyzing a 6-foot level in the steam generator were not acceptable in comparison with the standard set by 10 CFR 50.46?

A No, I don't recall that.

Q Do you recall that in the spring of 1978 or any time in 1978, your unit embarked on a program to resolve the question of what is an acceptable secondary sidewater level in the steam generators?

MR. BENEDICT: This is for the 205 plants we are talking about?

MR. SELTZER: Right.

A I can recall the program.

Q You made a presentation to higher management on that subject, right?

A I don't know.

MR. SELTZER: Let me mark as GPU 615 Bert Dunn's March activities report to Don Roy, April 3, 1978.

(March activities report of Bert Dunn to Don Roy, dated April 3, 1978, marked GPU Exhibit 615 for identification, as of this date.)

Q Is GPU 615 a copy of a report that you sent to Don Roy on or about April 3, 1978?

A Yes.

Q Do you see on the second page of the report where you discuss the work that had been going on in your section to analyze the 6-foot auxiliary feedwater level in the steam generators of the 205 plants?

A Yes.

Q It was your stated conclusion that 6 feet was inadequate to control the consequences of small break transients; do you see that?

A Yes.

Q Does inadequate, as you used that word and underlined it there, mean at the 6-foot level your calculations showed that you were not achieving

effective core cooling?

MR. BENEDICT: If you remember.

When you say effective core cooling, are you referring to any specific criterion; are you using that as a term of art as it is used in 50.46 or in reference to 50.46?

MR. SELTZER: I think that is probably the sense in which Bert Dunn uses it, but if he meant something else when he said that there was inadequate --

MR. BENEDICT: It doesn't say anything about inadequate core cooling. What I am asking, you used a term of art in your question, I am simply asking what you meant by it.

Q I will refer to the 50.46 standards. When you say the 6-foot level is inadequate to control the consequences of a small break transient, isn't it a fact that you were telling Roy that the 6-foot level could not cool the core to the NRC established standards? Isn't that what you meant?

A I don't know.

Q What do you understand inadequate to control the consequences of small break transients to mean?

MR. BENEDICT: What did it mean when he wrote

that?

MR. SELTZER: What he remembers now.

MR. BENEDICT: Don't answer that question. If you remember what you were writing about, tell Mr. Seltzer.

THE WITNESS: Could I have the question again?

Q What did you mean when you said the 6-foot level was inadequate to control the consequences of small break transients?

A I don't recall it so what I meant, I guess I don't know.

Q You mean you are willing to testify today under oath, swear to God you don't know what you meant by the phrase inadequate to control the consequences of small break transients?

MR. BENEDICT: That is right. He said he doesn't recall what he meant.

A Yes.

MR. BENEDICT: I may interrupt to make an observation in light of --

MR. SELTZER: You don't have to make any observation.

MR. BENEDICT: The nature of your question

and the looks on your face --

MR. SELTZER: You don't have to try to put my looks on the record. It is not necessary for you to put speeches on the record. We are asking questions.

MR. BENEDICT: I am prepared to pay half the cost of the transcripts so I am entitled to put on speeches like you are.

We are here to ask Mr. Dunn about his recollection. We are not here to ask him to interpret documents that he doesn't recall writing. The issue is what he recalls and that is what he is here to testify to.

If he doesn't remember writing this document and doesn't remember what he meant by the word inadequate, those are the facts that we are dealing with.

We are not dealing with what he may interpret today, or you might. That is something the court can do.

MR. SELTZER: That sounds like poppycock and you know it is. I think the author of a document is in a far better position to tell anybody else what he believes he meant when he used words in

phrases and you know that.

MR. BENEDICT: I can find 600 objections from you and lawyers representing your client on this exact subject. If you would care to disagree with me, we can go to the record books and look and maybe we will have to take everybody's deposition over again.

MR. SELTZER: That is not a position I have espoused.

MR. BENEDICT: I disagree with that.

MR. SELTZER: If you will show me a place where I have done that --

MR. BENEDICT: And your associates.

MR. SELTZER: I asked you to show me where I have done it.

MR. BENEDICT: If I have to, I will. I don't think the fact that you choose not to do so is terribly relevant either, just so long as you and your partners --

BY MR. SELTZER:

Q Do you see in the second paragraph where you have the sentence, "It is improbable that the peak cladding temperature would be less than 2200 Fahrenheit"?

A Yes.

Q That meant that under the analyses that had been done for the 6-foot level, you understood there were certain transients for which the peak clad temperature would probably exceed 2200 degrees Fahrenheit, right?

A That meant that it was our impression that the peak cladding temperature would probably exceed 2200 degrees Fahrenheit.

Q It would exceed it for certain small break loss of coolant accidents if the steam generator level were maintained at 6 feet, right?

A Using the word "impression" and "probably," we are talking about small breaks and it would be certain small breaks.

Q Those were breaks within the spectrum of the breaks that had to be analyzed in order to demonstrate the plant was able to meet the NRC's criteria for effective core cooling, right?

A Yes.

Q Specifically it was within the spectrum that had to be analyzed under 10 CRF 50.46, right?

A Correct.

Q For a break size within the specutrum that had to be analyzed under 50.46, you could not assure

yourselves the peak clad temperature remained under 2200 degrees Fahrenheit. It meant that there was not effective core cooling for that break size, right?

MR. BENEDICT: Could I hear that again, please?

(Record read.)

MR. SELTZER: I will withdraw that.

Q Isn't it a fact that unless you can demonstrate with assurance under approved codes that the peak clad temperature will remain under 2200 degrees Fahrenheit, then B&W could not state that there is effective mitigation of the consequences of a loss of coolant accident?

MR. BENEDICT: I will object to the question as asked and answered in Mr. Dunn's prior deposition.

If he understands the question and he can answer it, he is welcome to. I think you are basically asking him to do what we have already done, which is to interpret 50.46.

Go ahead, if you understand Mr. Seltzer's question, you can answer.

THE WITNESS: I understand the question.

A The answer is no.

Q Why?

A Because we could effectively mitigate an accident whose temperature was 2250.

Q Since one of the five criteria for effective core cooling is maintenance of peak clad temperature under 2200 degrees Fahrenheit, how could you demonstrate effective core cooling of peak clad temperature in excess of 2200 degrees?

A By performing an analysis showing that the peak clad temperature was limited to 2200 degrees Fahrenheit and a cooling medium was in place and temperature returned to lower values at some time.

Q You said by demonstrating that the peak clad temperature was no higher than 2200, is that right?

A No.

Q Did you hear her read back?

A Yes. I would like to amend that to 2250.

Q Is it your understanding that when the NRC says 2200, they allow for some latitude above 2200? Do you round off to the nearest hundred, is that how it works?

A No, the NRC means 2200.

Q How could you get away with 2250? Could you file a topical report showing peak clad temperatures for

a break within the spectrum of anticipated loss of coolant accidents having a peak clad temperature of 2250 and have the plant be licensable?

A No.

Q So when you gained the impression that you had on April 3, 1978 that peak clad temperatures would exceed 2200 degrees Fahrenheit if the steam generator level were maintained at 6 feet, you knew that more work had to be done to deal with effective mitigation of small breaks, right?

A Yes.

Q That is why you and your unit filed a preliminary report of safety concern regarding the water level in the 205 steam generators in April 1978, right?

A I do not know.

Q Do you remember that you did file a PSC on that subject?

A No.

MR. SELTZER: Let me mark for identification as GPU 616,PSC signed by Bert Dunn on April 4, 1978.

(PSC dated April 4, 1978, signed by Bert Dunn, marked GPU Exhibit 616 for identification, as of this date.)

Q Do you recognize the penmanship in the lower right-hand corner as being your name?

A Yes.

Q I take it you signed this preliminary report of safety concerns on April 4, 1978?

A Yes.

Q This is a report which you signed of a safety concern regarding the secondary sidewater level in the steam generators for type 205 plants, right?

A This preliminary safety concern indicates that with the use of a 6-foot level control for the auxiliary feedwater in Babcock 205 plants, the peak cladding temperature during a small break loss of coolant accident may violate the criteria of 10 CFR 50.46.

Q You say "may violate the criteria." Do you see the box number 2 in the upper left?

A Yes.

Q It says there it was found that the results of a certain small break LOCA do not conform to requirements of 10 CFR 50.46. Do you see that?

A Yes.

Q You didn't take issue with that when you signed this PSC, did you?

A I don't know.

Q You don't have any recollection of thinking that was wrong when you signed this PSC, do you?

A No.

Q Do you see boxes 3 and 4?

A Yes.

Q Box 3 asks the question, "To your knowledge, is customer aware?" What is the answer that was checked off?

A I don't think I can be positive from reading this. It looks like "No."

Q The question that appears in box 4, "To your knowledge, is NRC aware?", what box was checked off?

A "No."

Q You don't have any recollection today that either of those answers is wrong, do you?

A I do not.

(Recess taken.)

BY MR. SELTZER:

Q Prior to the Three Mile Island accident, had you as manager of the ECCS analysis unit initiated a lot of PSC reports of preliminary safety --

MR. FISKE: That question is clearly beyond the scope of this limited deposition.

MR. SELTZER: I will tell you why I am asking

it. I really want it as a background to this PSC report to find out whether this is a very unusual event, like the only PSC that Bert Dunn initiated relates to this particular calculation that we are talking about,or is this just one of a myriad of PSC's. That is all.

MR. FISKE: I understand why you want to ask it. That doesn't change our objection. The subject of our PSC's was something that was gone into in great detail with Mr. Dunn the first time. The mere fact that this happens to be a PSC which may result in part from a calculation in the calculation files does not in our judgment open up the whole subject of PSC and what the criteria is for them and under what circumstances he files them, and what doesn't.

MR. SELTZER: If you want to direct him not to answer that question, yes. I think you are doubly telling me, Benedict has an objection, you have got an objection.

If this stuff horrifies you that much, I am thrilled. It encourages me that we must be on a hot subject.

MR. FISKE: There is no need to make a lot

of speeches.

MR. SELTZER: You are the one who is speechifying.

MR. FISKE: This would be an appropriate inquiry were it not for the fact that we had eight days of depositions and we expressly agreed that the scope of this deposition was not going to include --

MR. SELTZER: All right. I understand you.

MR. FISKE: I will incorporate that objection later without repeating it if other things come up, to save time.

BY MR. SELTZER:

Q Was this PSC on the steam generator level the only PSC you ever initiated before the Three Mile Island accident?

MR. FISKE: I object to that on the same grounds.

MR. SELTZER: I press the question.

MR. FISKE: I press the objection. I am not going to let him answer it. Mr. Dunn will be at trial. You can ask him that question again. This is a discovery deposition limited to what is in the calc files.

Q It is a fact, isn't it, that B&W was never able to demonstrate that a 6-foot level could meet the core cooling criteria of 10 CFR 50.46?

A We did not demonstrate that a 6-foot level for auxiliary feedwater control within a Babcock 205 plant would result in small break loss of coolant accident temperature conditions for the spectrum which would meet the criteria of 10 CFR 50.46, at least portions of it.

Q You tried to demonstrate that and failed, right?

A I don't know.

Q Let me show you a June 9, 1978 memo that you sent to Cudlin, subject: CRAFT 2 Model Changes, which we will mark as GPU Exhibit 617.

(Memo dated June 9, 1978, from Bert M. Dunn to J. J. Cudlin, marked GPU Exhibit 617 for identification, as of this date.)

MR. FISKE: I will let Mr. Dunn identify this memo but that is as far as this is going to go.

Q GPU 617 is a memo that you sent to Cudlin on or about June 9, 1978 in the regular course of business, right?

A Yes, although I don't recall doing it.

Q As of two months after you had initiated a preliminary safety concern with respect to the steam generator water level, the evaluations and analyses that had been done by Shah and others still showed unacceptable results for small breaks with a 6-foot level, isn't that right?

MR. FISKE: I am going to object to this on the grounds that you are now going way beyond what the calc files contain.

MR. SELTZER: I don't think I am going beyond what the calc files contain. The calc files which are in front of him are the proof that the work done under his direction by Nehru Shah and others amply supports the conclusion that I was driving for with my leading question.

I think in fact the statement that Mr. Dunn made to Mr. Cudlin on June 9 is based explicitly on these calculations and on nothing else. This isn't drawn out of his head. He didn't make up the statement that the valuation showed unacceptable results. This is based on what Nehru Shah did in his calculations.

MR. FISKE: I am not disputing the fact that

the subject matter of the memo relates to what he did in the calculations. The scope of this deposition is to determine what the results of the calculations were.

MR. SELTZER: Precisely. That is all I am asking him.

BY MR. SELTZER:

Q Isn't it a fact as of June, as far as you knew, the results of these calculations were, for a 6-foot level they were unacceptable consequences for small break accidents?

MR. FISKE: I will let him answer that.

MR. BENEDICT: The question is does this refresh your recollection, Mr. Dunn's recollection, because you are asking him the same question that you asked him before. It is either asked and answered or that it refreshes his recollection.

MR. SELTZER: What are you doing, conducting a class for law students?

MR. BENEDICT: If you need one, I will.

MR. SELTZER: Don't be snide with me.

MR. BENEDICT: I am not being snide, I am just trying to clarify it.

MR. FISKE: Read it back.

(Record read.)

A I don't know.

Q And seeing your sentence, "The evaluation of the 6-foot auxiliary feedwater level control for the 205 plants has shown unacceptable small break consequences" doesn't refresh your recollection?

A No, it doesn't.

Q When you wrote that sentence to Mr. Cudlin, you were attempting to be honest and truthful, right?

MR. BENEDICT: If you are asking him what he remembers. He told you he didn't remember this memo.

MR. SELTZER: I am asking him now whether he believes what he was saying to Mr. Cudlin in this memo was accurate.

Q Were you intending to be accurate when you wrote to Cudlin; that is the question. Plain and simple.

A To the middle question, the answer is yes.

Q What about the final question?

A I don't know. I don't remember this.

Q What was the middle question?

A It was in the present tense. I have no reason to doubt or to question that I was attempting to be honest, straightforward and aboveboard, or however

you want to put it.

Q Do you remember that after the initial calculations produced unacceptable results, attempts were made to change the model to see if that would improve the calculation results?

A No, I do not remember.

Q Take a look at the first sentence of your second paragraph to Cudlin. You said there "In order to make a maximum attempt at showing that high auxiliary feedwater levels are unnecessary you are requested to combine the 177 model changes with the level dependent steam generator model in a special CRAFT version."

Does that refresh your recollection that you directed that there be changes made in the model to get acceptable results for 205 steam generator plant level?

A Does it refresh my recollection? No.

Q Do you remember that there came a point in time when you couldn't get sufficient allocation of funds to continue the calculations that were being done on effective core cooling?

MR. FISKE: I am going to object to that question. That has nothing to do with the calculations, I consider that beyond the scope.

MR. SELTZER: There is a break in the

calculation file where work seems to fall off and I am trying to find out from Mr. Dunn whether, isn't it a fact that the reason the issue does not proceed quickly to resolution in the calculations that are done because you couldn't get funding?

MR. FISKE: I am going to object to that and instruct him not to answer. Again, I made it clear you can ask these questions of Mr. Dunn at trial.

MR. SELTZER: I am going to mark for identification as GPU Exhibit 618 Mr. Dunn's July Activities Report dated July 31, 1978.

(B. M. Dunn July Activities Report, dated July 31, 1978, marked GPU Exhibit 618 for identification, as of this date.)

Q When you were out of the office, such as on vacation, did Bob Jones sometimes substitute for you in performing the administrative duties of head of the unit?

A Yes.

Q That would include signing a monthly activities report?

A Yes.

Q Is GPU 618 the monthly activities report for your unit as issued on or about July 31, 1978?

A Yes.

Q There came a point in time, didn't there, when you retracted the preliminary safety concern report that you had initiated with respect to the steam generator level problem?

MR. FISKE: I am going to object to that question; also beyond the scope of this deposition.

MR. SELTZER: It is our position that this question of steam generator level is one that is very difficult to fathom, if that is not a bad pun, and until we had access to the calculation files which explained what was going on and where the problems lay, we were not prepared to ask the questions on this subject.

So having had the calculation files and using them to understand the subject matter, we are now proceeding. Our subject is intentionally grounded in the calculations.

MR. FISKE: Mr. Seltzer, I don't accept that. I understand what you are saying. I think the documents that you have already presented to Mr. Dunn other than the calculations files, all of which were documents produced earlier in this

case, certainly disclose very clearly exactly what the situation was.

The only thing you were missing was the detailed basis upon which that conclusion had been reached, and I don't think you needed to await those detailed calculations to ask the kind of questions you are asking now.

The question is not whether the calculations were right or wrong, everyone is assuming they are right. The question is what happened afterwards.

I don't see the calculations are that significant other than your using them as a vehicle for going into this broad area.

I think our position is made clear without spending any more time on it.

MR. SELTZER: I disagree. I don't think we ever told you or were asked by you to limit our questions just to what is within the four corners of calculation files. I think we told you a number of ECCS analysis subjects are raised in the calculation files and we then told you that on those subjects we wanted to proceed, and we said specifically one of the areas was steam generator heat removals for small break loss of coolant

accidents. That is in David Klingberg's letter to Robert Fiske.

MR. FISKE: I am not suggesting you are reading that letter incorrectly. My understanding of that by subject, what was being referred to was the calculations that produced a certain result and the question would be what were those calculations, how were they prepared, how were they done, what did they show, what were the results of the calculations. That I have no quarrel with.

To the extent that the results of the calculations have long since been reflected in other documents, I don't think the mere fact that something happened to be in the calculation files opens up the subject altogether. That is the understanding we are proceeding on and one we are going to stick to.

MR. SELTZER: What are you relying on for that? Is that something you discussed with somebody from this office other than me?

MR. FISKE: I had a series of conversations with Mr. Klingsberg at some of which I believe you were present, following that letter that was written, and I believe that letter was written in

early May. I think we discussed this subject of Mr. Dunn's deposition at least two or three times after that, and there were, as I remember, three or four different items in that letter Mr. Klingsberg wrote, and we reached an agreement, I believe in June or early July, in which we agreed we would call Mr. Dunn as a witness at the trial so he would be available to answer any appropriate questions at that point.

Then at issue we would make him available for examination on documents in the calc files that had been produced after his initial deposition.

As you well know, we resisted for a long time producing Mr. Dunn at all, again on any subject. We finally did agree to make him available for questioning on those calc files. But my understanding of our agreement is exactly as I stated.

MR. SELTZER: You are saying my reliance just on what Dave Klingsberg wrote to you on May 14th is misplaced, that there are oral understandings that you reached that are inconsistent with what Dave Klingsberg wrote to

you in mid-May.

MR. FISKE: I am not going to say whether they are consistent or inconsistent with that letter. I am telling you what they were.

MR. SELTZER: You are saying they go beyond what the letter describes?

MR. FISKE: Yes. Clearly what happened, there were at least maybe two or three conversations. When we met in May or June, always the subject of Mr. Dunn's deposition came up. For a long time we said we didn't think you had any right to call Mr. Daunn at all.

MR. SELTZER: I know that. We are going over the same ground.

MR. FISKE: I am trying to answer the question you asked me.

MR. SELTZER: I thought Klingsberg's letter at least memorialized the subjects we were disputing, whether we would ever get Dunn for examination at all, and there was a lot of continuous discussion on that subject. Maybe continual is the correct word.

I never saw anything else that more precisely defined or narrowed the scope of the

Bert Dunn deposition than what was set forth in Dave Klingsberg's letter to you.

MR. FISKE: I am quite sure there was nothing further writen by either side, but I am telling you what my understanding was of the final meeting we had at which this was discussed, where we agreed to do two things. One was to produce Mr. Dunn at trial, and secondly, to make him available for examination on the calculation files which we had produced since he had been deposed before.

Certainly it was never my understanding that simply because a subject matter was covered in a calculation file, that that somehow opened up that whole subject matter. If we have a difference of recollection on that, I am sorry, but that is my -- that is our understanding and it is on that basis that we prepared Mr. Dunn for this deposition.

MR. SELTZER: I can certainly appreciate that since you didn't prepare Mr. Dunn on some subjects,you are not happy to have him examined on those subjects.

MR. FISKE: As I say, Mr. Seltzer, when Mr. Dunn is at trial, you can ask any question

you want which the judge considers proper. So there is no effort to prevent you from getting the appropriate information at the appropriate time.

BY MR. SELTZER:

Q Let me try to pull together what we can without rubbing the cat's fur the wrong way.

We have already established that the steam generator level issue arose because the 40-foot level was for some reason not acceptable. A 6-foot level was then analyzed. That was found to be unacceptable.

You initiated a preliminary safety concern because the issue was unresolved. Did B&W ever calculate what was a safe level for the secondary sidewater in the 205 steam plant generators?

MR. BENEDICT: I want to object to the characterization that forms the preamble to your question. I don't have an objection to the last question, whether or not an acceptable level was calculated.

MR. FISKE: Do you want to read the last part of the question back, please.

(Record read.)

Q When was that done?

A I do not recall.

Q After the Three Mile Island accident, right?

A I don't recall.

Q What, as you recall, was the resolution?

A As I recall, the resolution for the steam generator level control on the 205 plant, it is that the level will be raised to approximately 36 feet during small break loss of coolant accident.

MR. SELTZER: To fix a date when that result was reached, I would like to mark as GPU Exhibit 619 a monthly activities report from Mr. Dunn, dated April 29, 1980.

(April Activities Report from B. M. Dunn, dated April 29, 1980, marked GPU Exhibit 619 for identification, as of this date.)

Q Is GPU 619 a copy of a monthly report for your section issued on or about April 29, 1980?

A It is a copy of a monthly report issued for the unit.

Q On page 3, item G at the top is headed "205-FA Small Break Program." Do you see that?

A Yes.

Q Do you see the reference in there to the 36-foot level keeping the core covered?

A Yes.

Q Does this refresh your recollection that it was in or about the spring of 1980 when the resolution of the generator level small break problem was changed?

A No.

Q Do you have any recollection that is inconsistent with it being in the spring of 1980 that the issue was resolved?

A No.

Q At or about the time that the level issue was being analyzed for the 205 plants, was your unit also doing work on a dual level set point for one or more 177 steam generators?

MR. FISKE: I am going to object to that unless that is part of the calculation files.

MR. SELTZER: That is what I am trying to find out.

MR. BENEDICT: I am not sure how it is the answer to that question is going to find out if it is part of the calculation file.

MR. SELTZER: If the work is being done, I will find out whether it was being done in the same manner that these calculations were done, does he believe that there are calculation files

for them, and we will bring those calculation files.

MR. BENEDICT: Do you have the calculation files that you are looking for?

MR. SELTZER: That is what we will find out.

MR. FISKE: He can answer.

A Yes.

Q Which plant did that affect, or plants?

A What I recall is Davis-Besse.

(Luncheon recess: 12:30 p.m.)

oOo

A F T E R N O O N S E S S I O N

1:55 p.m.

B E R T M E R R I T D U N N, having been previously sworn, resumed and testified further as follows:

EXAMINATION (Continued)

BY MR. SELTZER:

Q In GPU 611, the calc file in front of you, would you turn to sheet 6, please.

Do you see in this list of analyses that were run before the accident, down at the bottom PMP 01?

A Yes.

Q Do you remember that at some point prior to the Three Mile Island accident your unit did some calculations for what would happen to small break mitigation if the reactor coolant pumps were left on during the transient?

A Yes.

Q Prior to doing that analysis, you had always made the assumption through licensing analysis that there was a loss of off site power coincident with the transient, right?

A Prior to that analysis, we had done or

considered the worst case for the small break evaluation to be with the reactor coolant pumps not running.

Q In other words, for loss of coolant accident analyses, you assumed that the reactor coolant pumps would be off, right?

A For the small breaks.

Q For small break loss of coolant accident analyses, you assumed the reactor coolant pumps were not functioning, right?

A Right.

Q In a period prior to the Three Mile Island accident, your unit did some study to see whether the results would be better or worse with the reactor coolant pumps left on during a small break loss of coolant accident, right?

A Yes.

Q Those are the calculations which are the PMP 01 calculations?

A It is my understanding PMP 01 is part of those.

Q Am I correct that the calculations were done because somebody had suggested that perhaps pumps on was not a more conservative case than the pumps off?

MR. SELTZER: Let me not use that word

conservative. I think like any political label, it is subject to abuse.

Q Am I correct that the pumps running case or pumps on during small break loss of coolant accidents was studied because someone suggested that it might produce worse results than pumps shut off?

A No.

Q What did you understand was the reason why in or about December 1978, B&W began to do analysis on a pumps running case for small break LOCA mitigation?

A Because we could not recover a computer evaluation or a detailed evaluation of a pumps on situation. We did not have evidence in support of our decision to do the analyses with the pumps off.

Q What?

MR. BENEDICT: Let's hear the answer again.

(Record read.)

Q Before December '78, you knew you analyzed what the effect on the system was of having reactor coolant pumps off while treating a small break loss of coolant accident, right?

MR. FISKE: Right before Mr. Dunn responds, I think we did the pumps running, on, off, in between, intermittent, whatever, in great depth

in Mr. Dunn's original deposition. To the extent that there is information in the calculation files.

MR. SELTZER: That is what we are getting to.

MR. FISKE: I guess my point is, why don't we get to it. The rest of this,we have all been over it many times before.

MR. SELTZER: Let me try to do it in five minutes and if I can't cover what I think is important background to the calculations that were done in five minutes, I will quit, because I agree it is not worth belaboring.

MR. FISKE: You have the background already from Mr. Dunn and others.

MR. SELTZER: I have got GPU 330, which was not an exhibit that we marked at Bert Dunn's earlier deposition even though he got a copy of it. I think it is something that we either received or understood only after we had initially deposed him.

MR. FISKE. That is exactly my point. That is not what this deposition is for.

MR. SELTZER: I had thought that it was to cover things that grow out of the calculation

files and grow out of materials that we had not been able to examine Mr. Dunn on earlier. This is something that is integrally related to the pumps running analysis, which is in the calculation files.

I assure you it is no big deal. I am just trying to understand why these PMP 01 calculations were done and why we have both computer runs and hand calculations for them in December '78 and January '79.

MR. FISKE: Why don't you ask Mr. Dunn that question?

MR. SELTZER: That is what I am trying to do.

BY MR. SELTZER:

Q Before December 1978, you had done analyses of small break loss of coolant accidents with the reactor coolant pumps off, right?

A Yes.

Q You were not aware of any calculations that had been done for the same small break loss of coolant accidents with the pumps turned on, right?

I think you used the words it wasn't evident that -- I am trying to clarify that you -- you meant in 1978 you weren't aware of any calculations that evaluated what the mitigation of the loss of coolant accident would

be if the reactor coolant pumps were left on instead of being shut off.

MR. BENEDICT: He also said that they couldn't recover computer evaluations on that issue. I don't think your characterization of the answer is --

MR. SELTZER: All it is is a question, not a characterization.

A I think I should state this myself. We were not aware of detailed calculations or computerized calculations, nor could we recover from our history detailed calculations or computerized calculations of pumps on in small break situations.

Q Isn't it also a fact that when you were deciding whether to analyze a pumps on situation, there were people in your unit who advised you that they thought it was possible that having the pumps on could be a worse situation than having the pumps off?

A I don't know.

Q Do you remember that the opinion was expressed in your unit that it is not obviously clear that leaving the reactor coolant pumps running results in an enhanced ECCS situation?

MR. FISKE: Is that quoting from some

document, Mr. Seltzer?

MR. SELTZER: Bob Jones wrote it on December 11, 1978; subject, small break analyses with RC pumps powered.

MR. FISKE: Maybe it would help if Mr. Dunn saw the documents.

MR. SELTZER: I am not asking him yet whether the document refreshes his recollection.

Do you want to see the document? The document is GPU 330.

Q Do you see the statement I just read?

A I am looking for it.

Q Four lines from the bottom of the first page.

A No, I do not recall this.

Q The next sentence says, "Thus, ECCS recommends an analysis be performed to examine this case."

You do recall that there was a recommendation made within ECCS that a pumps on situation be analyzed for small break loss of coolant accidents?

A No, I do not.

Q You know that it was analyzed, though?

A Yes.

Q You don't have any recollection today why it was analyzed?

MR. SELTZER: I withdraw that.

(Record read.)

MR. BENEDICT: Mr. Dunn wants to revise an answer.

MR. SELTZER: We are all in favor of accurate transcripts.

THE WITNESS: I do recall ECCS recommending that the analysis for the pumps on situation be made.

Q But you don't remember that part of the reason for recommending that pumps on be studied was because it wasn't obvious that leaving the pumps on resulted in a better or an enhanced emergency core cooling system situation, is that right?

A That's correct.

Q You don't have a recollection that that was not one of the reasons for studying it, do you? Your mind doesn't rebel against the notion that that was part of the reason for studying pumps on, does it?

MR. BENEDICT: Do you understand the question?

THE WITNESS. Yes.

MR. FISKE: He is simply asking you, do you have a recollection today that that was not any part of the reason?

MR. SELTZER: I think that is the way I phrased it the first time.

A I have no recollection today that the possibility of the pumps on situation producing a worse result than the pumps off situation was not part of the reason for recommending an evaluation of the pumps on situation. I have no recollection that it was part of the reason.

Q Did you give anyone the assignment to study the pumps on or pumps running situation?

A An assignment was given.

Q Who was assigned to work on it?

A Nehru Shah.

Q It is a fact, isn't it, that Nehru Shah proceeded to do that analysis in December '78 or January '79 or thereabouts?

A Yes.

Q Would you turn to page 188 of GPU 611. Are you able to recognize this page as being a page of the calculation file that refers to the PMP 01 pumps on analysis?

A It seems to.

Q It is true, isn't it, that the pumps on analysis was done by Nehru Shah for the smallest break size that was covered by the previous B&W topical reports for the 205 plant?

Let me ask a background question first. Withdraw that.

The previous B&W topical reports were small break loss of coolant accidents for 205 plants, went down as small as a .05 square foot break?

A I would want to check the topical report. I believe that is correct.

Q The smallest break for 177 plants before the Three Mile Island accident is a .04 square foot break, right?

A I am not sure on the 177 plants and I need to rescind my earlier answer.

MR. BENEDICT: By the earlier answer you said you thought that .05 was the smallest for the 205 plant.

THE WITNESS: That is correct.

MR. BENEDICT: You don't know whether that is right either?

MR. SELTZER: If you want, you can take a

look at GPU Exhibit 474, which you are one of the main authors of, which is the small break analysis for the 205 plant, and you can check in there to see what the smallest break size was that was analyzed.

A Within that document, the smallest break size analyzed is .05.

Q Isn't it a fact that within the comparable document for the 177 plant, the smallest break size analyzed was a .04 square foot break?

A With the comparable document BAW 10052, the answer would be yes.

Q From page 6, which is a table of contents kind of page, and from page 188, is it correct that the PMP 01 analysis for pumps on was done for a .05 square foot break?

A Yes.

Q One of the things that was calculated was what the void fraction would be at various times during the transient, is that right?

A Yes.

Q Void fraction refers to what percentage of the reactor coolant system is gaseous phase and what percent is liquid water?

A Yes.

Q A 93.6 percent void fraction would mean that 93.6 percent of the volume within the reactor coolant system was steam and 6.4 percent was liquid water?

A In the definition of the void fraction was the void fraction of the reactor coolant system, yes.

Q Is the particular break that was being studied in PMP 01 a break in the pump discharge line?

A I would have to review more details in this calculation to determine that.

Q Take a look at page 6 and tell me if it is your understanding that the reference to .05 square feet PD means that this is a pump discharge line break?

A The expression .05 foot square PD is typically used within B&W ECCS analysis to indicate a pump discharge break.

Q So you would understand the PMP 01 calculation of a twentieth of a square foot break in the pump discharge line?

A Yes.

Q Pump discharge refers to the discharge side of the reactor coolant pump?

A Yes.

Q So this is a postulated break in the pipe

that conducts water away from the reactor coolant pumps, right?

A Yes.

Q Shah has shown the progression of the accident in seconds, in the left-hand column; do you see that?

A Yes.

Q So the line that begins with the number 600 would be a line that shows system condition at ten minutes after the pump discharge line has sprung a leak of a twentieth of a square foot?

A That's correct.

Q Looking at the void fraction in the reactor coolant system outside of the pressurizer, this calculation file shows that there would be a 93.6 percent void fraction there, right?

A Subject to the quality of the Xerox that I have got in front of me, yes.

Q So that means after ten minutes of reactor coolant escaping through the pump discharge line break, the composition of the remaining fluid in the reactor coolant system would be 6.4 percent liquid water and 3.6 percent steam?

A The composition of the reactor coolant system,

without consideration of a pressurizer, would be at that void fraction.

Q You concluded from this analysis of pumps running in the PMP 01 calculation that there would be effective core cooling with the pumps running, right?

MR. SELTZER: Let me withdraw that.

Q You concluded from these results of the PMP 01 calculation that for the .05 square foot pump discharge line break that was being studied, there would be effective core cooling within the NRC standards; isn't that right?

A The conclusion was based on the specific results and the interpretation of the results.

Q Before I get to what it was based on, am I correct that your conclusion was, as I stated, that there would be effective core cooling for a twentieth of a square foot break in the pump discharge line with the reactor coolant pumps on?

A Yes.

Q You knew, didn't you, that with the reactor coolant pumps on, there would be a much more rapid loss of water from the reactor coolant system than if the reactor coolant pumps were off?

MR. BENEDICT: I don't know what "much more

rapid" means, but if you can, answer.

A No.

Q Why did you say that to Allen Womack in your January 31, 1979 report to him?

MR. BENEDICT: Why don't you show it to him if you are going to tell him that that is what it supposedly says?

MR. SELTZER: It is not what it supposedly says;that is what it says.

MR. BENEDICT: We don't know that yet.

Q Is GPU 117 a copy of your January monthly report that you sent to Allen Womack?

MR. FISKE: Could I ask you, was GPU 117 marked during Mr. Dunn's deposition?

MR. SELTZER: Yes.

Q Do you recognize this as being one of your monthly reports?

MR: FISKE: Hasn't he already said that?

MR. SELTZER: Right, but he didn't remember something that was in here so I want to refresh his recollection that this is his regular monthly report and we will go to what he meant to be relating accurately and to the best of his knowledge to Allen Womack on page 3.

Why do we have to get into a harangue on this?

MR. FISKE: I think if you are interested in finding out what Mr. Dunn was thinking at that time, if you would show him this document first, instead of asking him three years later for his recollection without the benefit of the document you would get it a lot quicker. If what you are really interested in is finding out what the facts are.

MR. SELTZER: If you want to agree that henceforth you will never examine any GPU witness about something that is in a doucment -- that is, not without showing him the document first -- I will be willing to go along. I don't think that has been your practice.

MR. FISKE: I think it has been, but anyway, go ahead.

BY MR. SELTZER:

Q Is this one of your regular monthly reports?

A Yes.

Q Do you see the reference on page 3 to the pumps running analysis that had been done in the PMP 01 calculations?

A Yes.

Q Do you see where you told Dr. Womack, without qualification, "Results show a much more rapid loss of reactor coolant inventory relative to a case with tripped reactor coolant pumps"· do you see that?

A Yes.

Q Isn't it a fact that reaching a 93 or 94 percent void fraction in ten minutes is a much more rapid loss of reactor coolant inventory than you would get with the pumps shut off throughcut the transient?

MR. BENEDICT: I am lost again. You dipped momentarily into this document and now you have simply used it as a lever to get back into a document that you admit you talked to Mr. Dunn about a year and a half ago. I don't see how this relates to the calculation files.

MR. FISKE: Putting it another way --

MR. SELTZER: I don't need two of you putting it differently. I understand you don't want me to examine Mr. Dunn on a lot of things.

MR. BENEDICT: You are going to get a chance to examine Mr. Dunn at trial on anything that is relevant. This deposition wasn't scheduled for that purpose.

MR. SELTZER: Figure out between the two of

you who wants to make this particular objection.

MR. BENEDICT: I defer to Mr. Fiske.

MR. FISKE: It is the same objection.

MR. SELTZER: I know it is. Why do I have to hear two people voice it? I am looking at the 93.6 percent void fraction in Nehru Shah's calculation and I had at first asked Mr. Dunn didn't that mean to you that there was a much more rapid loss of reactor coolant system inventory with pumps on than there was with pumps off.

I am allowed even under the narrow construction that Mr. Fiske wants to put on his agreement with us to try to show the witness other documents that will refresh his recollection of what he understood that void fraction meant.

MR. FISKE: To put it simply so I understand it --

MR. SELTZER: I thought Mr. Benedict was handling this question.

MR. FISKE: -- are you asking whether Mr. Dunn had an understanding at the time this analysis was made that in ten minutes, with the pumps off, he would have a void fraction of something less than 93.6? Is that what you are getting at?

MR. SELTZER: That is certainly implicit in the question. It can't be a much more rapid loss--

MR. FISKE: I won't object to that, if that is the question.

BY MR. SELTZER:

Q The question, Mr. Dunn, is isn't it a fact that you understood by the end of January 1979 that there was a much more rapid loss of fluid during a situation where the pumps were on versus same small break LOCA with the pumps off for the case being studied by Shah?

If you want to say today you can't recall, I don't care. I have got what you already told Womack.

MR. FISKE: That is exactly my point, Mr. Seltzer. It is right here in the memo.

MR. SELTZER: Fine. He said no, he didn't think that was true when I asked him without showing the memo. Now I am showing him the memo and I get objections from you and Mr. Benedict to showing him the memo because you don't think that is in the calculation file.

Let's not play games with one another. This is a simple point. I don't think he was misrepresenting the facts to Womack when he

reported this to Womack. I think this probably does refresh his recollection that there was a much more rapid loss.

I don't think your objections really are doing anything except making Mr. Dunn very nervous that maybe he shouldn't give away some big point to us.

MR. FISKE: That seems to be one of your favorite comments. Why don't you let Mr. Dunn answer the question?

MR. SELTZER: If the shoe fits --

MR. FISKE: I will let Mr. Dunn answer the question if by looking at this, it refreshes his recollection whether --

MR. SELTZER: Stop talking, will you.

THE WITNESS: I don't know whose question I am answering.

A Looking at the progress report of January 1979 does not refresh my recollection.

Q Is it your belief now, based on the results of the PMP 01 calculation, that there is not a much more rapid loss of fluid if the reactor coolant pumps are on?

A No.

Q In other words, it is your belief that looking at the PMP 01 results,that there is a much more rapid loss of fluid?

A No.

Q How can you say no to both questions?

A The nature of the loss of fluid is time-dependent of the concept. It could be either more rapid or less rapid.

Q Why did you tell Allen Womack that it was much more rapid with pumps on?

A I don't know.

Q Do you today believe that you mislead Mr. Womack when you said that to him?

MR. FISKE: I object to that, Mr. Seltzer. That is a very improper question. You mean intentionally misled?

MR. SELTZER: No, not intentionally.

Q Unintentionally or intentionally misled Mr. Womack.

MR. FISKE: I object to the form of that. He already told you he doesn't remember writing, why he wrote that sentence. He has told you, he has given his best answer.

MR. SELTZER: He didn't say he doesn't know

why. He said it doesn't refresh his recollection that the matter stated is true.

MR. BENEDICT: Is there a pending question?

MR. SELTZER: Yes.

Q Is it your belief that you were misleading Mr. Womack, either intentionally or not, when you told him there was a much more rapid loss of fluid?

MR. FISKE: I am going to tell him not to answer that question. It goes beyond the limited scope of this deposition; and secondly, I don't like the way it is phrased.

MR. SELTZER: How would you prefer to have it phrased?

MR. FISKE: Without the word "misleading."

Q Is it your belief that you told Mr. Womack something wrong when you told him in your January report, based on results you just received, that there is a much more rapid loss of fluid for pumps running rather than pumps off?

MR. BENEDICT: Are you talking about what does he believe or are you talking about what does he remember what he was talking about in this memo? He told you this memo has not refreshed his recollection.

Q Is what you said to Allen Womack wrong?

A I don't believe so.

Q You believe it is correct that there is a much more rapid loss of reactor coolant inventory with pumps on in contrast to pumps off?

A No. The level of communication contained in the progress report and the information provided there is correct.

Q In other words, the results show a much more rapid loss, is that what you are saying?

A No.

Q How do you rationalize the statement that you made to Allen Womack in the report with the qualifications that you are testifying to today?

A That I probably -- excuse me -- that the communication to Allen would have been on the large time frame for the accident, not on the small time frame at which time may be important to the loss of fluid. And that he had not a need to understand the fine structure but the gross structure, for example, out to ten minutes.

Q Out at ten minutes, there certainly is a much greater loss of fluid with pumps on than there would have been for the same accident at ten minutes with pumps off, right?

A For the conditions of PMP 01, yes.

Q Is it your recollection that at some earlier point in the transient, before ten minutes, there may be greater fluid loss with pumps off than with pumps on?

A Yes.

Q So the statement that you made to Allen Womack is correct, by the time you have a transient that has run ten minutes,but at some time short of ten minutes it would not be true?

MR. BENEDICT: Not a transient; the specific transient in PMP 01.

MR. SELTZER: Right.

A For the specific transient in PMP 01, that's correct.

Q What, if anything, is your recollection as to where the crossover point occurs between pumps on creating greater fluid loss than pumps off?

A The crossover point would be the point at which water traps are formed within the primary system such that the break sees predominantly steam flow.

Q Do you know when in point of time that occurs for this particular break size?

A No, I do not.

Q You concluded from these calculations of

liquid steam remaining in the reactor coolant system with the pumps on that there would continue to be effective core cooling, and you so testified already this afternoon, I believe.

I would like to show you some B&W calculation sheets which Mr. Benedict was kind enough to supply to us.

MR. BENEDICT: But not, however, performed by.

MR. SELTZER: I think anyone could take judicial notice that you didn't perform these calculations.

Let's mark these as GPU Exhibit 620.

(Document containing Babcock & Wilcox General Calculations marked GPU Exhibit 620 for identification, as of this date.)

Q Tell me if these are calculations with which you are familiar.

A I have examined these.

Q Do you recognize those as being calculation sheets that you referred to in determining that for the pumps running case that was studied in January 1979, there would continue to be effective core cooling?

MR. FISKE: Calculation sheets that he referred to back in '79, is that what you mean?

MR. SELTZER: I had asked, just so you know, Bob Wise to send us the calculations that demonstrated adequate core cooling due to force flow steam cooling situations as referred to on page 3 of GPU Exhibit 117.

The gentleman to your immediate right sent me a letter on July 18, 1982 saying responsive material is enclosed, and I have just handed Mr. Dunn that material.

I am just asking Mr. Dunn now, can he verify that these calculations are what demonstrated to him the fact that he has stated to Allen Womack; namely, that there is effective core cooling for the pumps running case.

MR. BENEDICT: The underlying question is, did Dunn see these-- you are talking about him personally in that time period?

MR. SELTZER: Yes. This has the 670 degrees Fahrenheit in the memo to Allen Womack.

A The question is, do I recognize these calculations as being the calculations referred to or supporting statements made in the January ECCS activity report, Section 1.2? The answer is no.

Q Can you identify those calculations at all?

A In fashion, calculations were given to me by legal representative yesterday.

Q When you said to Allen Womack, "The calculations have been performed which shows that..." et cetera, had somebody reported to you that such calculations had been performed or had you actually seen the calculations?

A I don't know.

Q It would be one or the other, right?

A Yes.

Q Today you just can't recall how you came to know that calculations had been performed?

A I know that I was told calculations had been performed. I know I was told something about their results.

I did not know whether I saw the calculations.

MR. SELTZER: Let's see how much cooperation we will get from counsel for B&W. I don't want to make more of an engima out of this than needs to be. I would like to find out whether these calculations which Rod Benedict produced for us this summer are calculations which, to the best of B&W's knowledge, were in existence prior to January 31 and are they ones that you believed

when you gathered them and sent them to me were calculations that were available to Mr. Dunn.

MR. BENEDICT: What I say in my letter about them is what I ascertained about them.

MR. SELTZER: You are being more enigmatic than helpful.

MR. FISKE: I think we can tell you that these in fact were in existence at the time Exhibit 117 was prepared. I don't think we are prepared to represent one way or the other whether Mr. Dunn himself saw them or just heard about them. I think he has answered that for you.

MR. SELTZER: All right, but just so that it is clear, you are stipulating that these records which we are going to mark as GPU Exhibit 620 were in B&W's file prior to January 31, 1979?

MR. BENEDICT: That is my understanding. I won't -- I can't be sure that it is January 31, 1979 as much as it is somewhere in that time period, prior to the Three Mile Island accident, and I think the best thing for me to do, Richard, is doublecheck this and if I have any different response I will tell you, to the best we can find out.

You can see as well as I can that there is no date on this document.

BY MR. SELTZER:

Q You don't know of any other hand calculations that were performed to show that there was effective core cooling with the pumps running other than GPU 620, do you? I mean done prior to January 31, 1979.

A At this time, no, I don't know.

MR. SELTZER: Let's mark the computer run for the PMP 01 calculation as GPU Exhibit 621.

(Series of sheets, top sheet of which is captioned File 8525, T36698-T37949 marked GPU Exhibit 621 for identification, as of this date.)

Q Are you familiar with ECCS analysis data that comes out in the form that GPU 621 is?

A To some extent.

Q You have reviewed transient analyses that have data printed out in this form?

A Yes.

Q Would you turn to page 738, please. It is machine-stamped in the corner, the lower right-hand corner. The date in the upper right-hand corner on that page is January 11, 1979. Do you see that?

A Yes.

Q Is that the date that this was run on the computer?

A I believe so.

Q Do you recognize this as a computer modeling of the PMP 01 pumps on case?

A This run is entitled PMP014T.

Q If you look at the first page, just after the page that has the exhibit mark on it, it perhaps helpfully records under PMP105T, .050 square foot pump discharge break.

MR. BENEDICT: 1980 date.

MR. SELTZER: If it helps you, Mr. Dunn, Rodman W. Benedict told us on July 8th that this PMP01 run that he supplied was the source for Table 188 -- the table on page 188 of the calc file.

Am I right, Mr. Benedict?

MR. BENEDICT: If that is what my letter says, yes. I don't know how that is going to help Mr. Dunn. Either he recognizes it or he doesn't.

MR. SELTZER: That is fair enough. I am not really asking him cold for an identification. You have apparently consulted people in the

company to determine that this is the computer run that supports Nehru Shah's table on page 188.

MR. BENEDICT: Why are we pursuing it?

MR. SELTZER: Okay.

MR. BENEDICT: Why don't you ask Mr. Dunn if he has ever seen this computer run before, or seen it prior to the Three Mile Island accident, if that is what interests you.

We have been sitting here for five minutes and Mr. Dunn has been paging over this to the best of his ability, but we haven't gotten an answer.

MR. SELTZER: It is a very long document and he may be trying to be very certain that this is what it generally appears to be.

MR. FISKE: Without belaboring the record, we are prepared to tell you that this was in existence in January of '79. Isn't that good enough, so that Mr. Dunn doesn't have to spend the rest of the afternoon reading it?

MR. SELTZER: Are you also willing to stipulate that this is the computer run which is the source for the table of figures which Nehru Shah has on page 188 of the calculation file which we have previously marked as GPU Exhibit 611?

MR. BENEDICT: I guess the question is whether Mr. Dunn could get you down that road. He is the wrong witness. You are asking the wrong questions.

MR. SELTZER: I am trying to reach an amicable agreement with Mr. Fiske. Maybe I don't need Mr. Dunn's testimony.

MR. FISKE: I cannot answer that question yes or no, and if we can find out, we will.

MR. BENEDICT: I think this would have best been taken care of by calling on the phone and asking me what I meant, if you didn't understand the contents of my letter.

MR. SELTZER: I understand it.

MR. BENEDICT: What is the problem?

MR. SELTZER: You are saying you want to get back to me.

MR. BENEDICT: You asked me a question, was this in existence by a particular day --

MR. SELTZER: I didn't ask that.

MR. BENEDICT: You said was it in existence by January 31, 1979.

MR. SELTZER: We are finished with that.

MR. BENEDICT: That is the only thing I said about getting back to you about. This is not the right forum to deal with this. I think we can amicably work this out. You haven't asked him if he hasn't seen this before.

MR. FISKE: Let's deal with this independent of Mr. Dunn.

BY MR. SELTZER:

Q Mr. Dunn, I would like you to assume for purposes of the succeeding questions that GPU Exhibit 621 is the source material for the Nehru Shah chart on page 188 of GPU 611.

Would you take a look at page 738, please. The left-hand column lists nodes. Do you see that?

A Yes.

Q What are nodes as they are used here?

A A node is a mathematical entity within the CRAFT code simulation which refers to a space region within which the thermodynamic properties of fluid are to be calculated. Typically it represents a zone of the reactor coolant system.

Q Would I be correct if I said that one of these nodes is the core region?

A I would need to review the run in more

detail but one of these nodes is all or part of the core region or more.

Q In GPU 611, could you take a look at the CRAFT nodes diagram which is page 27.

A Okay.

Q Is that description of nodes what you were referring to as the nodes within the CRAFT computer code?

A Yes, assuming there hasn't been any deviation within the calc file for this particular run

Q Is node 2 the lower plenum?

A Yes.

Q Is node 3 the core region?

A Node 3 would contain the core region.

Q Would it contain anything else?

A I would have to review the details of the model to tell you whether it contained anything else or not.

Q The last column on page 738 in Exhibit 621 shows the liquid volume in the different regions of the reactor coolant system, right?

A Yes.

Q In Region 2, which was the lower plenum or lower head, what is the liquid volume, 890 cubic feet?

A On page 738, 893.

Q 893 cubic feet?

A Yes.

Q The volume of water in the core region, is that 1164 cubic feet?

A Yes.

Q Those are liquid volumes at time zero in the transient, right?

A Yes. Page 738 is time zero.

Q That is a picture of the conditions in the system at the last millisecond before the break occurs, is that correct?

A Right.

Q There is no steam in the reactor coolant system outside the pressurizer, right, looking at the column steam mass and bubble mass?

A That's correct.

Q Would you turn to page 362 of Exhibit 621. Page 362 shows the condition of the system at ten minutes into the transient, right?

A Correct.

Q By that time the lower head has 322.5 cubic feet of liquid water, right?

MR. BENEDICT: The lower head you established

was node 2, is that right?

MR. SELTZER: Right.

A Yes.

Q The core region has 133.6 cubic feet of liquid water, right?

A Correct.

Q Am I also correct that prior to the Three Mile Island accident, you know of no other analysis that was done with this degree of completeness for a pumps running case with a small break loss of coolant accident in progress?

MR. BENEDICT: Could I hear that again?

(Record read.)

A That is true.

Q The liquid water volume for the lower head and core region is 456.1 cubic feet, right?

A That is true.

MR. BENEDICT: That is a matter of adding those two numbers we talked about up; is that all you have done, Mr. Seltzer?

MR. SELTZER: That is all I did. I don't know what Mr. Dunn did to arrive at that.

Q With the reactor coolant pumps on, the liquid water and the steam remains in a homogeneous

mixture, right?

I will withdraw that, because I see you are puzzling over it.

Your understanding before the Three Mile Island accident was if you left the reactor coolant pumps running while there was steam and water in the reactor coolant system outside the pressurizer, the steam and water would remain in a homogeneous mixutre, is that right?

A On the microscopic scale, yes.

Q You mean there might be small microscopic places where the mixture was not homogeneous?

A If one goes to the extreme microscopic and looks at the droplets of water, it certainly is not homogeneous.

Q Can I simplify it? If one could take a sample of a cubic foot of volume from anywhere in the reactor coolant system outside the pressurizer, would there be a homogeneous mixture of steam and water if the reactor pumps remained on?

A Mostly.

Q Liquid water is substantially more dense than steam, right?

MR. BENEDICT: We have been through all of

this, Mr. Seltzer.

Go ahead and answer.

A Yes.

Q If the reactor coolant pumps are turned off, you knew that the liquid water volume would fall to the bottom of the reactor vessel and the steam would rise to the top?

MR. BENEDICT: I object. This has nothing to do with these calculations. You are simply going over information that we covered completely in Mr. Dunn's deposition a year and a half ago. This computer run you are talking about is a homogeneous model. There is no discussion here about phase separation. So let's just move on.

MR. SELTZER: It is called the phase separation model on page 6.

MR. BENEDICT: If I am wrong on that, then I am not wrong on the fact we have gone through all these phase separations in Mr. Dunn's prior testimony,so you don't have to answer that question.

Q From the calculation which showed the liquid water volume in the lower head and core would be 456 cubic feet at ten minutes into the transient, you knew,

did you not, that if the pumps were shut off at ten minutes, there would be 456 cubic feet of water that would come to rest in the bottom of the core region?

MR. BENEDICT: I object.

You don't have to answer.

You are asking him to make a calculation now. You are asking him to interpret a document as to what he thinks now. He is not here to testify as an expert. He is here to tell you what the document means.

MR. SELTZER: That is what I am asking.

MR. BENEDICT: That question doesn't ask that. You are asking what if this would happen, what if that would happen, and it is not in these files; and to the extent it is, you are simply asking him to read something that is there.

Q Did you know in January 1981 if 456 cubic feet would be sufficient to cover the core?

MR. BENEDICT: Did you mean 1981?

MR. SELTZER: '79.

Q Did you know in January 1979 whether 456 cubic feet of liquid water would be sufficient to cover the core?

MR. BENEDICT: Again, it is beyond

discussing these calc files.

MR. SELTZER: It is directly related to the calc file.

MR. BENEDICT: We have gone through with you for eight days Mr. Dunn's knowledge about various components in this plant. We have not -- we are not going over that again today.

MR. SELTZER: I don't intend to. I now have for the first time, because you provided it in July 1982, the calculations which showed exactly what the water volume was they knew would exist and which they had calculated would exist on January 20, 1979.

MR. BENEDICT: Mr. Seltzer --

MR. SELTZER: Let me finish.

MR. BENEDICT: That document was given to you a year before. Absolutely true.

MR. SELTZER: I don't know when it was available. We didn't get it until July 1982 and we have been writing letters, finding out what the basis for the pumps running analysis was for a long time before that.

MR. BENEDICT: If you don't know what to ask for since you are given access to our central

files, I can't be responsible. You have had access to PMP01 for years. That is what you are asking questions from.

MR. SELTZER: I don't care when you think I had access to it. I know when we got it. We got it this summer. It is a calculation. We are entitled to ask Mr. Dunn about calculations in the calc files.

I am asking him directly from a page of this calculation file and you haven't inhibited our examination based on these numbers up until now. I can only assume that your reluctance to let him testify now is not related to the source of my question but to where I am going with it, and you are obviously afraid that he is going to spill the beans that he knew there would be core uncovery with only 456 cubic feet of water.

MR. BENEDICT: Let's stop that kind of silliness.

MR. SELTZER: You are being silly, and you know it.

MR. BENEDICT: Are you going to contend that every time a lawyer objects to a question, that he is trying to cover up something? If that is

the case, I can't wait to have the judge see what your operators and your lawyers representing your operators say. Talk about coverup; you are the one who is always getting personal.

The reason I did not object to your questions yet, because you asked him what does this question mean. It means there are so many feet at that node. It means that there are so many feet at that node, that is fine.

What Mr. Dunn knew in January 1979 or January of 1981 is not relevant -- strike that -- it is not relevant to this limited deposition. You may ask him thatat trial. He will be there. You can ask him.

You had eight days to ask him a year and a half ago and it is just not the purpose of this deposition as I understood it, and I have got to go with what I understand.

MR. SELTZER: We didn't have when we deposed Mr. Dunn the last time, the black and white evidence as to what was known in January 1979 would be the water volume in the core if the pumps were left on, causinga small break loss of coolant accident.

MR. BENEDICT: The fact that you chose to depose Mr. Dunn early in your deposition schedule while you know document production was still continuing is a risk you took. Mr. Dunn will be at trial and I am not interfering with any proper examination on any subject.

We came here and prepared Mr. Dunn at this late date --

MR. SELTZER: I know what you are saying. I don't think the position you are taking, where I am examining directly from the face of a calculation document, and in fact a document that I was examining from with no interruption when he was here, I don't think he is going to block my examination on this tomorrow morning. I don't know what to say.

MR. BENEDICT: I can't guarantee anything will be resumed tomorrow.

MR. SELTZER: There is no other question in my mind that otherwise we could finish today. With you standing in my way of examining him precisely from a document that I only got from you this summer, which is a calculation document, I prefer to ask it with senior trial counsel

here instead of you.

MR. BENEDICT: I am telling you that Mr. Fiske agrees with me. You have terminated your deposition.

MR. SELTZER: I am not saying I am finished.

MR. BENEDICT: You finish now or I can't guarantee that Mr. Dunn will be back. That is all I am telling you.

BY MR. SELTZER:

Q You knew in January 1979 that 205 plants were raised loop plants?

MR. BENEDICT: I am going to object to the question, but let him answer. It is a question you have asked him before, but I will let him answer to move along.

A Yes.

Q You knew the 177 plants, except for Davis-Besse, were lowered loop plants?

A Yes.

Q You knew if the pumps were shut off in the middle of a transient for the 205 plants, water would drain down through the loops into the core region?

MR. BENEDICT: Asked and answered eighteen months ago. I am not going into it again. It is

beyond the scope of this limited deposition.

You can ask Mr. Dunn at trial.

Q You knew for the 177 plants that there would be water that would get trapped in the loops?

MR. BENEDICT: Same objection.

Q Didn't you?

MR. BENEDICT: Don't answer.

Q Did you learn before the Three Mile Island accident that all or any part of your February 1978 prescription for the management of high pressure injection was being incorporated in procedures that were being drafted for any B&W plants?

MR. BENEDICT: Beyond the scope of this deposition. You can ask that question at trial.

MR. SELTZER: That is explicitly part of the May letter.

MR. BENEDICT: I am not sure I understand. The May letter is inoperative,to use one of President Nixon's favorite phrases, or one of his press people.

MR. SELTZER: You are putting yourself in good company.

MR. BENEDICT: Mr. Fiske just told you there were several conversations which neither of us were

privy to. I can only tell that that the calc files are the limitation of this deposition. Anything else can be gone into at trial. Mr. Fiske has told you that we have agreed to bring Mr. Dunn to the trial.

MR. SELTZER: I think the incorporation of Mr. Dunn's recommendations into the emergency operating specifications is something that was not beyond the scope of this deposition, and I think --

MR. BENEDICT: If that is the only question--

MR. SELTZER: Why do you keep interrupting?

MR. BENEDICT: I am sorry. You are absolutely right. Excuse me. Go ahead.

MR. SELTZER: Let's resume tomorrow morning at 9:30.

MR. BENEDICT: If that is the only question you have, I can assure you that Mr. Fiske is going to agree with me it is not. I strongly recommend that you continue with the remaining questions on the calc files because I don't guarantee that Mr. Dunn will be here tomorrow.

MR. SELTZER: Since I was proceeding with questions on the calc file and you see fit to

block the examination, I am not going to proceed any further with you.

MR. BENEDICT: I told you go ahead and I will make my objections and then we will have a record of it to deal with it.

MR. SELTZER: I will see you tomorrow.

MR. BENEDICT: Perhaps.

MR. SELTZER: Let me schedule it for 10:30. I don't have very much more.

(Time noted: 3:45 p.m.)

Bert M. Dunn

BERT MERRIT DUNN

Subscribed and sworn to before me

this 9 day of Nov 1982.

Danita R. Kidd

Commission Expires: July 1, 1983
Commissioned Notary as Danita D. Robertson

CERTIFICATE

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

I, CATHERINE COOK, a Notary Public of the State of New York, do hereby certify that the continued deposition of BERT MERRIT DUNN was taken before me on Wednesday, September 15, 1982 consisting of pages 969 through 1068;

I further certify that the witness had been previously sworn and that the within transcript is a true record of said testimony;

That I am not connected by blood or marriage with any of the said parties nor interested directly or indirectly in the matter in controversy, nor am I in the employ of any of the counsel.

IN WITNESS WHEREOF, I have hereunto set my hand this 3rd day of October, 1982

Catherine Cook

CATHERINE COOK

I N D E X

E X H I B I T S

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1006 - B&W did not demonstrate that 6' SG wtr level wd give SBLOCA results w/in reqt's of 50.46

1008-09: DNK if calcs showed unacceptable consequences for SBLOCAs with 6' SG level

1018-19: DNR when acceptable SG level was ~~set~~ worked out: resolution was to raise level to 36' during SBLOCA

1019-20 - GP 0619 - 4/80 activities rpt - Dunn not refreshed that this is when ~~HPI~~ SG level problem resolved.

1020-21 - WR also being done on decal level w/rpt for DB

1023 - prior to TMI, Dunn's unit did analysis to see if situation better w/ RCPs on or off during SBLOCA

1024 - Dunn: did analysis/he didn't have evidence to support decision to do analysis w/ pumps off

1029: Dunn recalls Jones statement that ECCS do pumps on analyses

1030 - Shah worked on pumps on analysis in 12/78 & 1/79.

1034 - 35 after 10 min if .05 ft^2 pump discharge bk, Shah's calcs show void fraction to be 93% +

1035 - conclusion was with pumps on, WR still have effective core cooling

1042 - DNK why he told Womack void fraction wd be lower w/ pumps off

~~1045 - under cond'ns of this calc'n, recall is that~~

1058 - if leave pumps on, generally have homogeneous flow of steam & wtr in RCS