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PRESIDENT'S COMMISSION ON THE

ACCIDENT AT THREE MILE ISLAND

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DEPOSITION of GENERAL PUBLIC UTILITIES SERVICE CORPORATION by JOHN G. MILLER, held at the offices of the President's Commission on the Accident at Three Mile Island, 2100 M Street, N.W., Washington, D.C., on the 5th day of July, 1979, commencing at 3:20 p.m., before Stephen McCrystal, a Notary Public of the State of New York.

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

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ALSO PRESENT:

WILLIAM BLAND

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SM/pw

JOHN G. MILLER, having been first duly sworn by the Notary Public, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. GORINSON:

Q Would you state your full name for the record, please?

A John G. Miller.

Q What is your present business address, Mr. Miller?

A 1202 East Wyomissing Boulevard, Reading, Pennsylvania 19611.

Q Have you brought a resume with you today?

A (Handing.)

MR. GORINSON: May we mark this as Miller Exhibit No. 5.

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

Q Mr. Miller, is your resume which has been marked as Miller Exhibit No. 5 accurate and complete as of today?

A Yes.

Q Sir, could you briefly state for us your educational background? Oh, I see it. You have your

BS in mechanical engineering from Purdue University and your MS in engineering from Purdue; is that correct?

A That is correct.

Q Now, from 1971 to 1975 were you the vice-president of Generation Operations at GPU?

A Yes.

Q That is the service corporation?

A Yes.

Q Did you have responsibility for the nuclear plant at TMI No. 1 as well as the fossil fuel plant?

A No, I didn't. It wasn't operating at that time. It started in late 1974.

Q That plant started operation in late 1974?

A But I was not involved in that. I was primarily involved in the fossil plant.

Q While you were with GPU actively, did you play any part in the development of the TMI project?

A Not significantly, no.

Q Since retiring from GPU you have been a consultant; is that correct, sir?

A Yes, sir.

Q As a consultant, what types of work have you done?

A Varied types of work from organization, personnel

problems, primarily -- some engineering problems where they needed some assistance on the fuel committee for the Keystone and Conemaugh generating stations and the General Office Review Boards for both TMI and Oyster Creek.

Q What are the General Office Review Boards?

A That is a board that reports directly to the president of each company and it has an overview of safety items in each of the nuclear plants. And they review these and report back to the president whether they think more action should be taken or what action should be taken, not necessarily what action but some action should be taken, and it is really an information board on safety matters to the president.

Q And the name of that board is abbreviated to GORB?

A Yes, GORB.

Q GORB. When did you begin to sit on the GORB for the first time?

A I think when I retired, in 1975.

Q Prior to the time that you started sitting on the GORB for TMI you had no experience with nuclear plants; is that correct?

A When I was vice-president of and chief engineer

of Met Ed Company, the construction work and the licensing, I was the officer in charge. I was not in close detail to the work but I was the company officer representative.

Q That would have been between 1969 and 1971?

A Yes.

Q How far along was the work on TMI 1 in the years 1969 to 1971?

A That is rather hard to give a single number, but the plant started in 1974, so I -- I mean, it started to operate, it started construction in 1967, so somewhere 40 to 60 percent, somewhere in that range.

Q And as vice-president and chief engineer of Met Ed between 1969 and 1971, what kind of matters would you deal with with respect to TMI Unit No. 1?

A Well, I dealt with engineering matters that came up to the vice-presidential level, also construction problems -- mostly construction problems -- and then I was the official signee for licensing matters.

Q Engineering problems dealing with the primary system at TMI 1, would you review those?

A I don't quite understand the question relative to what I could review without being here this time next week.

Q Let me try a different way. You said that certain engineering matters would come up to the vice-presidential level; is that correct?

A That is right.

Q Could you give me an example of a type of engineering matter dealing with TMI 1 that came up to your level?

A The pump seals on the reactor circulating pumps were a troublesome matter that came up to me and finally came up to the president to arrive at a solution to whether we would stay with the original pumps or shift to Westinghouse, and the decision was finally made to shift to Westinghouse because we didn't think that the pump that B&W was proposing was ready yet, and when we got those kinds of problems that required a high level decision, they got up to the vice-president.

Q So it would be fair to say that those kinds of matters that required a high level decision came up to the vice-president?

A That is right.

Q Were any decisions with respect to TMI 2 coming up to your level between 1969 and 1971?

A No, not for my decision. They were made by others.

Q By "others," do you mean people below you?
A No, TMI 2 originally was going over in Jersey and the decision was made not to proceed with Jersey but transfer to TMI as Unit 2, and that decision was made by GPU and Jersey Central to move it, and the top people in Met Ed, and I was informed, but I was not really part of the decision-making process to move it.
Q But once it was moved to TMI 2, would engineering decisions that required a vice-presidential decision come to you or go to somebody else?
A At the same time that move was made, GPU Service Corporation was being organized, and they were picking up the detail work on engineering and construction on Unit 2, and the only connection that I really had was signing as the corporate officer for Met Ed in licensing.
Q Just so I am clear, on Unit 1 you would have direct responsibility up the chain of command?
A Yes.
Q Since that was a Met Ed project; is that correct?
A That is correct.
Q Unit 2 was originally a Jersey Central project that was to have been Oyster Creek 2?
A That is correct.

Q It was then moved to TMI 2?

A That is right.

Q And at or about that time GPU Service Corporation was coming into existence and GPU Service Corporation took over responsibility for the construction of Unit 2?

A And engineering.

Q And engineering of Unit 2, and that your only responsibility was to sign certain matters on behalf of the licensee, Met Ed?

A That is correct.

Q What types of things were you signing on behalf of the licensee? Can you give me some examples?

A Well, there is, as the operating company -- and most of those came through after I was transferred to the service corporation -- anything that had to do with the operating company's responsibility under the license, in developing the license, of course, had to be signed by an officer of the operating company, which was me.

Q But the additional work that would precede the signing of a particular paper, would that be done by Met Ed or was that done by GPU Service Corporation?

A That was primarily done by GPU Service Corporation.

There was a twilight zone when this transfer was being made, but more and more the intent was that it was to go to the service corporation.

Q But on matters to be filed with the NRC, for instance, it would be the licensee, Met Ed, who would be signing off?

A That is right, yes. However, the paperwork was more and more being prepared by the service corporation.

Q Now, in 1971 you moved over to GPU Service Corporation; is that right?

A Yes.

Q Did that require any change in physical location for you?

A I changed offices, but I still stayed in Reading.

Q You weren't up in Parsippany?

A No, no. GPU has an office in Reading.

Q And once you moved over to the service corporation, did you have any further relationship to TMI 2?

A Well, there was an interim period till Met Ed continued to sign and I signed as -- well, I was vice-president of both for a short time until -- and I don't remember the date when I quit being a vice-president of Met Ed, but my primary responsibilities were not in the

nuclear area. We had problems other places that I was involved in.

Q Who had the primary responsibility in the nuclear area, if you know?

A Well, that would have gone in the service corporation and Verrochi was vice-president and head of Generation in the Service Corporation.

Q So he was vice-president for Generation?

A For the service company.

Q And you were vice-president for Generation operations?

A Production.

Q It says here in your resume, Exhibit 5, that you were responsible for operating performance of all generating stations in the GPU system, including the operation, maintenance, modifications, personnel training, et cetera. Were you the responsible official for personnel training at TMI 1?

A No, I didn't get that much involved in that because they had that set up in Met Ed in an organization at the Island and I didn't spend that much time with them. When they got into problems and they needed my help, why I would help them. But primarily, I did not follow it that closely.

Q Was any planning going on as to personnel training for TMI 2 while you were vice-president of Generation Operation at GPU Service Corporation?

A Yes. They started to plan for No. 2 before they started to operate No. 1.

Q And what part did you play in that personnel training?

A Nothing specifically in the training, but I played some part in urging that the thing be started.

Q What form did that urging take?

A Verbal contact with the people in Met Ed's nuclear group.

Q Was there discussion at that time as to what form the personnel training should take for TMI 2?

A Well, there was a lot of discussion of the form it should take. It is hard to be specific because that is a growing and a changing thing. I am sure that there was a lot of discussion, but I did not get involved in details of that discussion.

Q Who did get involved in details of that discussion?

A Well, that would have been R.C. Arnold, primarily.

Q And did Mr. Arnold report to you at that time?

A No, he reported -- initially he reported to J. S. Bartman who took the job as vice-president and chief engineer. But one of the changes that I recommended -- and which was accepted -- was that the Generation Division be pulled out from under a vice-president and report directly to the president in all GPU companies. And at that time he was made vice-president and reported to the president.

Q The president being Mr. who?

A Krites.

Q How would Mr. Arnold interact with you in terms of personnel training?

A Not specifically in detail except if he wanted to discuss something with me or wanted some advice or something. If I heard that he wanted to talk about something, then I would call him. There was no direct reporting from him to me.

Q Even though you were responsible for personnel training?

A Because I had sufficient problems in what I was doing otherwise that I did not move into the area of nuclear training because it was a specific thing and they were in the process of developing their crew and they were working with the NRC training group and outside

groups, getting all the advice they could get, and really I didn't feel I could contribute very much in the details and specifics. So I just didn't get involved.

Q So in the area of nuclear training Mr. Arnold was principally responsible and you were concentrating more in the area of training on fossil fuel plants?

A Training and hiring policy and getting more engineers.

Q Would that be true also in the area of operation?

A That primarily was true in operation. That was my area of responsibility.

Q Operation was your area of responsibility but would that be true of the nuclear plant? Would operations of a nuclear plant have been dealt with by you or did Mr. Arnold have primary responsibility?

A Primarily he would have dealt with them. If he needed help, he would come to me.

Q But there was no reporting relationship?

A No reporting relationship.

Q What about the area of maintenance?

A Well, the same thing would be true. If they

had problems with maintenance in which I could help them, they came to me. If there wasn't a specific area where I could help them, I did not move in to take responsibility for it and they worked it out and accomplished it themselves.

Q But again Mr. Arnold would have primary resonsibility there in the nuclear area?

A That is right.

Q And you in all other areas and there was no reporting relationship between the two of you?

A No, no formal -- there was a relationship, but not a formal relationship.

Q Now, it also says here that you were responsible for the development of the use of computers for monitoring and process controlling plants. Was that true in the nuclear plant as well?

A Yes.

Q Could you outline for me what role you played in the development of computer use in the TMI plants?

A When TMI 1 was brought about, B&W made a proposal to furnish the original computer system. The company, then GPU, acquired a nuclear -- I mean, a computer expert of wide experience, and for a time he reported to

another department in the service company. We had so many problems in the fossil plants with our computer system that finally he was transferred to me in that job I had and he also was involved in the problems with the computer at TMI in getting it running, and therefore, I became involved.

We also started an upgrading of that computer system while I was still active and that was done under the direction of Hamilton who reported to me, and when he needed help, why, I furnished it.

Q Hamilton was the computer expert?

A Yes.

Q Do you know his first name?

A William.

Q Is he still with GPU?

A He is with the service corporation over at Mountain Lakes, New Jersey.

Q Now, you mentioned that there were problems with the computer system at TMI that later required an upgrading; is that correct?

A Well, the computer that was furnished initially was a single computer and it was limited in what it could do, and it soon became obvious the way the operators depended on the computer that that had to

be upgraded, and it was a very difficult thing to do, and we worked with B&W and Bailey Meter or Mod-Comp on a way to do that without interfering with the operation of the plant, and we came up with a Phase 1, Phase 2, and Phase 3 development, and as of now, they are through Phase 2. They are considering how to do Phase 3.

That would have replaced the old computer with two redundant computers. It would greatly expand what it is capable of doing. It would make a very nice installation.

Q This is in Unit 1?

A Yes. What we did in Unit 1, we expected to be the prototype of what we would do in Unit 2 because Unit 2 came with the same Bailey computer that Unit 1 did, so it would be necessary in Unit 2 to go through the same Phase 1, Phase 2, Phase 3 modifications.

It would have if the unit was running. Whether it will now or not depends on how fast we can get the computers and the software to work.

Q I am just trying to get the time frame and what is being done. Unit 1 needed a modification, substantial modification to the computer system?

A Replacement.

Q Replacement, and that was to be done in

three phases; is that correct?

A That is correct.

Q With the final phase, as I understand it, being a total replacement of the computer?

A That is right.

Q Unit 2 came with the same computer?

A Unit 1 originally came with what Bailey Meter called their 855 model. Unit 2 came with the same model computer only a little bit modernized, but basically the same computer.

Q So that Unit 2 required the same modifications that Unit 1 required?

A There was a modification added to Unit 2. They put a mini-computer on to pick up some of the work that Unit 1 did not have, but it does not make it a modern system. So ultimately it will get the same thing that 1 will get, at least that was our intent when we were developing the modification.

Q Was there any discussion at the time that the computer modifications were being planned as to whether there was other existing technology at the time the Bailey Meter computer was bought that could have done the job that these modifications would now permit?

A I guess maybe you will need to clarify your question.

Q Let me clarify the question. At the time the Bailey Meter computer was bought, was it the latest technology available?

A I don't think so, but it was the latest that B&W was prepared to offer, and this was all bought as part of a package with the nuclear plant.

Q Had GPU or Met Ed looked at other computers at that time?

A Oh, Hamilton was familiar with all the computers on the market, but at the time the initial purchase was made that was not true because Hamilton wasn't with the company then. But after we got involved, it soon became obvious from his knowledge that we needed to upgrade the system.

Q I guess what I am getting at is what factors led Met Ed to select the Bailey Meter 855 as the computer to be used in the plant?

A At the time that it was purchased, there was not any nuclear plant working with any appreciable amount of computer systems controlling in them. We wanted to get a computer program of the fuel management, so we ordered a system from B&W that would primarily do that,

and we used it for some other things as far as we could within the capability of the computer. Primarily that is what we were after when we bought the unit originally, which included the computer.

Q And just so I can clarify, how does the current TMI 2 computer compare with the TMI 1 computer?

A As of today?

Q As of today.

A TMI 1 still has the original 855 computer in service. It also has a Mod-Comp computer which is doing some functions. It can replace the 855 if the 855 dies. Ultimately the 855 will be eliminated and a redundant Mod-Comp unit will be put in and then we will have these two computers for Unit 1.

On Unit 2 we have an 855 which came with it. It has been modified by the addition of a mini-computer to pick up some functions on balance of plant and other things within its capability. So as of now Unit 1 has both the 855 and the Mod-Comp. Unit 2 has only the 855 and a mini-computer to sort of help it out.

Q Let me put in front of you two exhibits that were previously marked as O'Connor Exhibits 3 and 4 and ask you to refer to Exhibit 3. Have you seen that document before today?

A I prepared it.

Q And that was written by you on April 18, 1979?

A Yes.

Q And if you will look at Page 2, a copy of that was supplied to Mr. O'Connor; is that correct?

A Yes.

Q And a copy was supplied to Mr. Long?

A Yes.

Q Why was a copy supplied to Mr. Long, sir?

A He was coordinating all the documents that were being developed for Mr. Arnold.

Q How did you come to get the assignment of doing the 12 valve investigation?

A Well, Mr. Arnold and Mr. DeCamp realized it had to be done and they decided that since they did not think that I would, if I approached these operating people, that they would look on me as a threat because I am not a part of the line organization, and yet they all know me, they know who I am, and so because of that relationship, they thought that I could get a good response in conversation with them in asking them to try to remember what went on. And basically that is why I was given the assignment. And Mr. O'Connor was

assigned to me because he had been working on the problem for several days before I got there.

Q Now, who first approached you about taking on this assignment?

A Well, DeCamp had asked me to do it.

Q When was that?

A A week or so before that date. I started up there about the 10th.

Q So he approached you about the 3rd or 4th?

A That week sometime. Floyd Smith actually called me and wanted to know if I could come up -- he is a vice-president of administration for GPU Service Corporation -- and when I got there, why, Mr. DeCamp said that he and Bob Arnold had been talking about who could do this job and had decided that they would like for me to start it.

Q What did they tell you about the job they wanted done?

A They didn't tell me anything. They just told me what the situation was and they would like to find as much about it as they could as to what happened or didn't happen.

Q Now, you and Mr. O'Connor started your

investigation on about the 10th or the 11th; is that correct?

A Yes.

Q How did you go about doing your investigation, sir?

A We first reviewed the outage and what had occurred so that I could get familiar with the sequence of events, and then we started talking to the individuals who were involved in the surveillance testing, because it became pretty obvious that the time that these valves could have been left closed was at the surveillance testing. And so we talked to the operating people and the relief crew individually, all those we could find at the time they were working on it, and I guess we got to everybody on the relief crew whose responsibility was to do it. We did not talk to Cooper because he was off duty and it was reported to us that he had gone to the hospital. And I went back and looked for him a day or two after that and they said he wasn't back yet, and nobody seemed to know when he was going to come back, and Mr. Arnold wanted to get the report out, so I did not wait for him to come back.

Q So you never spoke to Mr. Cooper about his actions on the 26th?

A No.

Q Have you spoken to Mr. Cooper since you wrote this report?

A No.

Q To your knowledge, has anybody on the Met-Ed or GPU staff discussed with Mr. Cooper his actions on the 26th?

A Not to my knowledge.

Q In the course of your investigation, did you or Mr. O'Conner make notes of your interviews?

A Yes. We each made little scrap notes of what we got, and then we sat down and prepared these items which you have here.

Q The items that are marked as Exhibit 4?

A Yes.

Q That is in front of you too, sir?

A Yes.

T2 Q Those scraps of paper, did you retain those?

A No.

Q How about Mr. O'Conner, to your knowledge, did he retain them?

A No. After we recorded everything there, why we both threw everything else out.

Q Let's look at Exhibit 4 which is the

handwritten set of questions and answers. Where did these questions come from, Mr. Miller?

A They came -- Mr. O'Conner and I sat down and talked about what we wanted to find out and these were the questions that we thought of.

Q Had these questions been provided to you by Mr. DeCamp?

A No.

Q Mr. Arnold?

A No.

Q Do you know who Ernie Blake is?

A Yes.

Q Had he provided you with any of these questions?

A No.

Q Had they discussed the areas of investigation with you prior to your starting the investigation?

A Only generally or broadly, what had happened, and what they would like to find out.

Q Had you attended a meeting before you began your investigation with Mr. DeCamp, Mr. Arnold, and Mr. Blake?

A I had talked to them individually, not specifically but in general, about the sequence of events and things

that happened, but not about these questions specifically.

Q But there was no time when you met with them jointly, yourself and Mr. O'Connor, prior to your undertaking the investigation?

A No. We did talk while we were having the investigation and we asked certain questions -- I forget what they were now -- general questions, and we discussed some of our findings with them. But it was just a matter of information.

Q Did you discuss those findings with these gentlemen jointly or separately?

A I would think it was separately.

Q Let's look at Question No. 2 on Page 1 which says, "Do the EF-V 12's have position indicator on the rear panels?" What was the significance of that question, sir?

A I don't know who asked the question, but somebody raised the point that there was a separate board in the control room that was a display of positions of certain valves, and one of the questions asked is were the 12 valves on that board. And we asked someone originally, and the answer was no, but we went and looked ourselves and the answer was yes. So that is why that is marked

out and changed.

Q Just so I understand this, you originally asked someone whether there was a rear panel?

A Everybody knew there was a rear panel.

Q Excuse me, position indicator on the rear panel?

A For these valves?

Q Yes. You went and you asked somebody?

A We went and asked somebody. I forget who it was. And they said, "No." We put "No" down. But then we looked and found they were there.

Q This somebody that you asked, was he in the control room?

A I don't think he was a control room operator. It was an engineer there, I think, but I forget now who specifically it was. It was somebody we thought ought to know, but obviously, they didn't.

Q Do you remember what his name was?

A No.

Q At the time was it somebody that you knew?

A It was somebody in the plant organization.

Q Yes, but I guess what I am asking is the person that you asked -- you said you thought he ought to know -- was that person you asked the question of

someone you had previously known before you asked him the question?

A I don't think so, but I don't remember specifically. I think it was an engineer that was on staff, not one that I had known personally.

Q How did you know he was an engineer?

A I asked somebody who he was or we asked him who he was.

Q And he told you "No."

Now, what led you, after he said "No" -

A Well, we had more conversation between us, and probably with others too, but I don't remember specifically what raised the question in our mind if that "No" was correct. So we then went out and specifically looked at this board. The board was behind the ropes where everybody was except those who were working there were supposed to go. So we initially did not go back there, but finally, to settle it, we got a hold of one of the bosses and he took us around there and we looked.

Q Did there ever come a time when Mr. Arnold told you that the 12's have a position indicator on the rear panel?

A Not that I remember. I don't remember ever discussing it with him.

Q Now, looking at the answer to Question 2, there is a sentence that is bracketed and that sentence is, "Note: The local switch is not a key-locked switch." Do you see that sentence, sir?

A I did that.

Q Why did you bracket that sentence?

A I wanted to emphasize it so that later when I was preparing this memorandum I would consider whether I wanted to include it in the memorandum or not. I went through the whole thing and did that to a number of items.

Q The things that you bracketed, did you consider those to be less important pieces of information or more important pieces of information?

A I would say that I thought they could be significant, not that I knew or thought they might be more important or not.

Q But you thought they could be significant or more significant than the other information in the answer?

A Yes, and that probably, in this case, the question of whether they were key-locked or not -- and I am sure that was a subject that Ed O'Conner and I discussed -- and in some instances these switches are key-locked and

only used in emergency cases with the use of a key. We were wondering if these were the same kind because this is an emergency panel and basically that was a curiosity item, I guess, as much as it was a significant item as far as -- but I did not consider it sufficiently important, I don't think, to include it in there (indicating).

Q You would have expected, going in, that this would be a key-locked switch?

A I really didn't expect one way or the other. We just wondered if it was, and so we checked it and it is not.

Q But you did say that you found that curious?

A Yes.

Q Why?

A Well, in some of our fossil plants these kinds of things have a key lock on them and we wondered whether they did the same thing here.

Q So you were just curious to see if they had the same that you had in your fossil plant?

A That is right.

Q Would you look at Page 3 of Exhibit 4, the handwritten notes, the second paragraph of the answer? There is some writing in the margin. Can you identify

whose writing that is?

A That is mine, "Test of Non-Return Valves."

Q What led you to write that comment in the margin?

A Do you have the diagram of the system there?

Q You mean Attachment 3 to your April 18 memorandum?

A Yes.

Q Yes, sir.

A Later I make reference to it in these notes, and it is also referred to in the memorandum. The three pumps you see across here --

Q Yes.

A That first valve is a non-return valve which means the flow can go this way (indicating) but it can't come back that way (indicating).

Q Right.

A And the procedures for surveillance test - and also the Section 11 of the ASME Code requires these valves to be tested -- and that is basically what this question refers to.

Q Let's look at that second paragraph that your comment is next to. Is that Mr. O'Connor's handwriting in the second paragraph?

A No, that is all mine.

Q All yours?

A All mine.

Q The paragraph that starts, "It should be noted that the valve line-up appeared to be too extensive" --

A Yes, that is my writing.

Q The next sentence, "It places both EF-W trains to the steam generating service, which is probably a tech spec violation."

A Yes.

Q Is that your writing?

A Yes.

Q What did you mean by the first sentence?

A Well, when we were looking at this, obviously, the question of the tech spec violation came up. The way the procedure was set up they closed both the 12 valves and then they have no emergency feed system, and the question that we asked was, "Can you do that under the tech specs?" When we asked the question -- and I forget who gave us the answer -- and initially it was that an operator stands by this and on surveillance if there is a trip, that he would open these immediately -- which is probably still a violation of the tech spec --

but by closing both of these valves, obviously, they take the whole thing out and we said it is too extensive, we could close one side off and keep the other in service, and that is what we were referring to when we said that we thought the valve alignment was too extensive, that you could still accomplish what they needed to do by closing off half of it.

Now, there is still a question whether that doesn't violate the tech specs. I mean to do your surveillance without violating the tech specs. I mean to do your surveillance without violating the tech specs is a very difficult thing and this is one case where it is almost impossible to meet Section 11 and not.

Of course, Section 11 requirements on surveillance were established on the plant after the plant was designed and not before it was designed. So this was a backfit arrangement.

Q So in order to meet the Section 11 requirements, you had to violate your tech specs?

A Yes. And if you want to discuss this some more, I can tell you what they did, and what they did was very logical. They thought if the 11 valves would hold -- and they are automatic valves -- then they could test these pumps and the pressure would be held by these

valves.

Q The 11's?

A The 11 valves, and then they could get a test on the non-return valves as well as the backflow on the pumps, but those valves were not tight, and of course, instead of backing up and taking a new look, they said, "Well, we can accomplish this then by closing the 12 valves." That was Revision #4.

Q Could they have accomplished the same thing by making the 11 valves more tight?

A No. The 11 valves are control valves. A control valve is inherently not tight. The problem was that you chill the steam water going into the generator every time you run the system when you test it and there are only a limited number of times that you can shock the system -- that is not the way the system was originally set up to work.

Q Page 5 of the handwritten notes labeled "Observations"; is that in your handwriting?

A Yes.

Q The first observation, "The two men who signed the surveillance test form for the test conducted on March 26, 1979, stated that they felt their signature only pertained to the test form and the attached data

sheet and does not imply that the system valves were properly realigned." Do you see that, sir?

A Yes.

Q Did you discuss with them how they obtained that understanding?

A Well, what they were saying is that this surveillance test was to test the pumps and the valve realignment was only incidental to testing the pumps, and therefore, these surveillance test results were explicit as far as the pumps and that non-return valve was concerned, and therefore, not a valve alignment surveillance test.

Q But were they not supposed to realign the valves?

A That is right.

Q At the conclusion of that test?

A That is right.

Q Did you discuss with them how they reached the understanding that their signature only pertained to the test form rather than a conclusion by them that the system valves were properly realigned?

A Well, if you look at the data on the forms that are turned in, they have only to do with the specifications relative to the valves and that when they sign

that, that is the only thing that they are signing. The valve realignment is incidental and it is supposed to be checked off and it is supposed to be done, but it is not part of this surveillance form and the data. They throw out this form relative to the pump, and I guess that is what they are saying.

They didn't deny they shouldn't have opened the valves.

Q Was it their view that they had reopened the valves?

A They thought they had, yes, but when you asked them specifically, "Do you remember doing it," when we talked to the auxiliary operator and the relief shift CRO, they could not remember specifically that they had done it. The auxiliary operator stated that, "I know they told me it was done because I checked it off, and I remember that." But, he said, "I was standing back and I was not up looking at the lights and seeing whether they were open, and I did not look to see who did what to what valve."

Q Did their supervisor go through that drill with them?

A On this day?

Q On March 26th.

A No.

Q Who was their supervisor that day? Was that Mr. Guthrie?

A Yes. He was the shift foreman.

Q Mr. Guthrie did not go through the check-off with them?

A No. That would be impossible, certainly impractical, for him to try to follow everything they do in these surveillance tests. There are so many of them and they are going through according to a schedule. If he went through each specific item, he might as well do them himself, and that would be impossible.

Q Well, let's look at Attachment 2 to Exhibit No. 3, which is your report, which is the surveillance performance form.

A You mean the surveillance procedure 2303?

Q The computerized printout form that is headed "Surveillance Performance Form." It is marked in the upper right-hand corner "Attachment 2."

Do you have that in front of you, sir?

A Yes.

Q Do you see about halfway down the page it has the heading, "Results," and then it says, under that, "Check one only," and the check on that pag

"1. Performed okay."

A And that is very significant. Everything performed okay.

Q And that was performed by an employee and the signature on the right is J. K. Leonarons.

A That is right.

Q And he was or is auxiliary operator, is he not?

A Yes.

Q And he performed that portion of the surveillance test which was to take place outside the control room?

A That is correct.

Q And after Mr. Leonarons came back with his check list and signed this form saying "Performed okay," that was approved by Mr. Guthrie; is that correct?

A Yes.

Q What does Mr. Guthrie's signature saying "Approved" mean on that form?

A It means that the test has been performed and the results are satisfactory and that the operator under him has signed it and said it is satisfactory, and if he has any questions, he will go and ask certain questions of the operator. But it is his responsibility

to get it done and when the operator tells him that everything tested okay, then his signature means that he approves what this operator has done.

Q But before putting down his signature that he approves that the procedure was performed okay, does Mr. Guthrie or did Mr. Guthrie on March 26th make any independent check on what Mr. Leonarons had done?

A I don't think he did. We did ask that question and he said that he did not involve himself in the details on that day. His function is to train the operators to do these things and see that they do them.

Q Mr. Guthrie didn't check the check list, did he?

A No.

Q And that check list was, in fact, discarded?

A That is right.

Q Who was the last person to look over the check list?

A The AO gives it to the control room operator or the relief control room operator.

Q Who would that have been, if you remember?

A It is a funny name.

Q Hemelia?

A Hemelia.

Q And after Mr. Hemelia was satisfied that the check list was, in fact, complete, he would discard it?

A Yes.

Q Did you inquire as to why Mr. Hemelia's signature doesn't appear on this surveillance form?

A He is the lead operator and primarily his function is to operate anything in the control room that needs operating because the auxiliary operator cannot do it. It is the responsibility of the auxiliary operator to run the test, but the functions and operations that he cannot do because he is not a control room operator, the relief CRO has to do it for him.

Q But I guess what I am getting at is that Mr. Guthrie did not review the check list, Mr. Hemelia did. What rationale was there for Mr. Guthrie signing something approved that he hadn't reviewed?

A Well, I am sure he reviewed this sheet before he signed it, and that is what the surveillance test was all about, and he only assumed that the valve alignment was returned to normal.

Q The only thing that Mr. Guthrie reviewed was a sheet that had a check saying "Performed okay."

A That is right, and if you wanted to ask the

auxiliary operator any specific questions before he signed, he could, and he probably did. But the CRO in that case is only there to operate the equipment from the control room because he is the only one who is licensed to do it. The auxiliary operator cannot do it.

Q Did the control room operator, Mr. Hemelia, fill out a form?

A No, he does not fill out anything.

Q He does not fill out anything? What was the reason for that, as they explained it to you?

A He is not part of the test. The test is conducted by the auxiliary operator. The control room operator is the lead operator in the control room, but what is done outside of the control room the auxiliary operator does.

Q And no part of that test is performed in the control room?

A Only what they do in valve realignment or start the pumps, that sort of thing, which is incidental to making the test.

Q I see. Because it was incidental, Mr. Hemelia would not have to fill out a form?

A Right.

Q And Mr. Guthrie would not have to approve Mr. Hemelia's actions?

A No, because his actions are only doing what the auxiliary operator needs done.

Q What was your opinion about that procedure, this procedure of having Mr. Leonarons fill out a check list, having him hand that check list to Mr. Hemelia, having Mr. Hemelia discard the check list, and at some point within a few minutes thereafter or before, Mr. Guthrie approving the procedure? Did you find anything unusual about that mode of operation?

A Yes. We questioned that step and I mentioned it in -- somewhere; I don't know if it is in the memorandum or not, but it is in some of these notes -- if they did keep those sheets, and they said they got so many of them that their files were running over. This is only one of dozens of surveillance tests that go on all the time.

We then raised the question, "Yes, but why don't you keep the last one?" And their response to that was, "Yes, probably that is a good idea."

Q There is a line for a third signature on this surveillance performance form which is Attachment 2 to Exhibit 3, a line that says "Witnessed by Employee,"

and a space for that signature. Do you know what the function of that line is?

A I am not sure but I would assume that that is a Quality Assurance employee who was sent to see that the thing was done right according to the specs.

Q Would a Quality Assurance employee be involved in this kind of surveillance test, the one performed on March 26th?

A Not unless he was assigned to make a spot check. Then he would observe and check to see whether everything was done according to the procedure, and then he would sign as witness. That is what I assume that means.

Q Do you know what it means though?

A Not specifically.

Q Did you ask them what it means?

A No, I didn't. But they did tell us that periodically Quality Control checks their surveillance and makes a routine check, and so I would think that is a safe guess that that is what that means.

Q Now, looking at Page 7 of these handwritten notes, are those your notes on Page 7?

A Yes.

T3

Q You have three possible explanations for

the 12 valves being closed on that page; is that correct?

A Yes.

Q Next to the second one, "In the excitement of the first minute of the accident on 3/28/79, the CRO may have mistakenly shut the EF-V 12's." There is a question mark next to that. Whose question mark is that?

A That is mine.

Q What led you to write that question mark down?

A Well, I discussed it some more with O'Connor and also with the operator, and of course, they were very positive that that did not happen, and I put that there just as a reminder for further question to two different people.

Q The operators that you asked about that were the operators that were in the control room at 4:00 a.m. on March 28?

A There was the supervisor to those operators.

Q Mr. Zooey?

A Zooey, and the engineer and shift foreman. We were talking to so many people I can't remember who all we followed up on.

Q Did you consider it possible that those valves might have been intentionally shut sometime between March 26 and 4:00 a.m. on March 28?

A Yes, but we -- at least I felt after talking to the operating people -- that there wasn't any -- I didn't get any feeling that they were the kind of people who would intentionally shut them.

To shut these valves from the so-called local position down there was in a zone where they didn't permit anybody to go, and anybody that is outside that walked in there to do that would have -- he would have been very foolish.

Q You say "to shut those valves locally" would be in a zone where they didn't permit anybody to go. What zone are you talking about?

A That so-called local control which, I say somewhere that there is a board down near these pumps where these things can be operated. We asked the auxiliary operator to show it to us and he wouldn't do it because he said, "I am not going back there," and it is taboo and nobody goes back there because the radiation was too high."

Q This was post-accident?

A Yes.

Q Prior to the accident was that a restricted access zone?

A It is not -- no, I don't think it is. It is not an area though that people normally would go because it is sort of an out-of-the-way place. If anybody did go there, it would be somebody who obviously went to do some damage and it would have to be somebody from the outside, in my opinion, because I didn't meet anybody in the operating crew who I thought were foolish enough to do that.

Q How could you make the determination based on meeting those people as to whether they were foolish enough or had the inclination to intentionally shut off the 12 valves for whatever reason?

A Well, everyone I talked to I found to be sincere, open, wanting to answer our questions. We didn't get any hedging. If they weren't sure, they said so. And you develop a feel for people. So neither Mr. O'Connor nor I felt, in our discussion, that the first choice we would pick is somebody from the outside coming in closing those valves.

Q Well, did you check to see whether anybody from the outside had been given access to the grounds at any time between March 26 and March 28?

A Well, it is not just the grounds, he has to be given access to the plant and inside the No. 2 operating area.

Q Had anybody been given such access between March 26 and March 28?

A I am sure there are construction people around but not in that particular area. There wasn't any construction going on in this area.

Q Did you make that check?

A No, we didn't.

Q Did you make a check of the company personnel files to see whether anybody had any either employment grievances or other grievances against the company who was on site between March 26 and March 28 at 4:00 a.m. with unrestricted access to the plant?

A No, we didn't.

Q Did you make any evaluation as to what effect the 12 valves and the closing of those 12 valves had on the accident that occurred on March 28 at 4:00 a.m.?

A Come again with that question?

Q Did you make any evaluation of what effect the closing of the 12 valves had on the accident that occurred at 4:00 a.m. on March 28?

A Yes. We talked to a number of people and a study

was underway to determine how much that delay in opening those valves could have contributed to the problem, and we were told that it did not appear that this was a significant point relative to what occurred later.

Q But just so we can summarize, you based your conclusion that an intentional closing of those 12 valves was ruled out on your impressions of the people that you interviewed at the plant?

A Plus the fact that when we questioned them about the surveillance test, we got the definite impression that you had -- in the first place they all agreed that both control room operators were at the board when the auxiliary operator came up and gave them instructions to realign the valves, and they both agreed that -- that is Hemel' and the auxiliary operator, Leonarons, agreed that both control room operators had operated some of the valves when he called off "Open this" or "Close this," one of them did it and the other one did it, and he wasn't sure which one did it.

My experience tells me that one thing that is going to occur when two people are doing one man's job, you have a perfect set-up for a s ip, and as we reviewed this thing, a we pointed out here, it was our opinion that there was a chance there for the error being

committed, and we felt strongly enough about it that we didn't feel like going back and recommending that we run an FBI check of everybody in personnel and everybody else. Now that the operator, Cooper, stated he remembers opening the valves put a little different complexion on it, but in my mind I can very easily understand how they would fail to reopen these valves because they do it frequently and when you sit and think, "Now did I do this or didn't I," and if this is something that you have done before, it is easy, you can remember doing it, but it may have been that you didn't do it then, you did it the time before. And I think it was not a good situation to have two people there responding to the auxiliary operator to do this job.

Q So let me see if I understand this correctly. There were two control room operators responding to Mr. Leonarons, Mr. Hemelia and Mr. Cooper?

A Yes.

Q And one or the other of them was responsible for opening those valves on the morning of March 26?

A Well, they were responsible to get the valves open. When the auxiliary operator says "Open the V-12 Valve A," he said he distinctly remembers them answering "It is

done," but he did say that he did not know whether Hemelia did it or Cooper did it because they were both standing there and they were both responding to him, and some of them -- Hemelia was doing some of them and Cooper was doing some of them.

Q Based on your investigation, which of these three alternative explanations for the closing of the 12 valves do you think most likely?

A The first one.

Q That they were not reopened at the conclusion of the surveillance test?

A Yes. But I still think that Cooper is being honest when he thinks he remembers doing it. But I think to have two people doing it is what is wrong and they do too now.

Q If we could turn further back in these handwritten notes, the first page following the end of your observations that starts with "Conf - Joe R. Bashista, do you see that page? Is that page written in your handwriting, sir?

A Yes.

Q Who is Joe R. Bashista?

A He is in the inspection group that writes the procedures and checks up on this group and also sends

out each week what surveillance tests are to be conducted, and there are several in that group -- I think Morck was one -- and they report to a gentleman by the name of Rheem, I think -- I don't know whether his name is here or not.

Q So is it fair to include from this paper that you and Mr. O'Connor interviewed Mr. Bashista and Mr. Morck?

A Yes.

Q And you interviewed them about the surveillance test procedures?

A Yes, how they are developed, and their relationship to Section 11 of ASME Code, and their relationship with the NRC in getting approvals, and the violation, possible violation of the tech specs, and all those things we reviewed with this group.

Q Now, it says "frequency ASME Section 11." What is the frequency that ASME Section 11 requires, if you know?

A Well, pumps, once every 31 days; valves, every three months.

Q And that is the listing that is just below the frequency, is it not?

A Yes.

Q According to your memorandum which is Exhibit 3, you say that surveillance of the emergency feed system valving, the EF-V 12-A and 12-B valves has been accomplished 12 times during 1979 prior to the date of the incident. That 12 times, is that consistent with the requirements of ASME Section 11?

A Yes. That is what they are meeting in doing all those surveillances.

Q I see. So in order to meet ASME Section 11 they would have had to have had surveillance of that system about 12 times during 1979 prior to the date of the accident?

A Yes.

Q Now, in the middle of the page you have the statement, "Violation of tech specs: Enter Action statement for surveillance testing NRC." What does that mean, sir?

A We asked had they discussed with NRC this question of what we consider a possible tech spec violation and asked for an exception.

Q What was their response?

A They have not.

Q Did they give you a reason why they had not?

A No, they didn't.

Q Did you ask them for a rationale as to why they had not?

A Yes. The rationale, as I pointed out, when they first wrote those procedures, they depended on the 11 valves, and that was not a violation because they were automatic and if there had been an accident and the steam generators had required water, they would have come open and so that would not have been a violation of the tech spec. As near as we can determine, they made Revision 4 without giving it sufficient thought to what that did in relation to the tech spec.

Q But they had not informed NRC of the inconsistency between ASME Section 11 and the technical specifications?

A Yes. They had sent all this information to NRC. Of course, NRC gets piles of paper and probably nobody has read it. NRC gets all these procedures.

Q Now, the next sentence is "Both V-12's out questionable." What do you mean by that?

A Well, that we think is a violation of the tech spec.

Q Looking at the next page, the last paragraph at the bottom, there is a sentence, "The thinking was that by entering Action Statement for surveillance

testing this would meet tech specs but this is questionable." Do you see that?

A Yes. The opinion was expressed that what they should have done was to enter an action statement with NRC asking for an exception to this because they could not do the surveillance testing without violating the tech specs, and we questioned that they still could meet the tech specs even if they had filed such a statement.

Q Did they file such a statement?

A They didn't, not on No. 2.

Q Did they file on No. 1?

A They filed several on No. 1 verbally. Primarily it is in connection with that non-return valve.

Q They filed verbal action statements?

A Yes. They went down to NRC last October and they reviewed with them their surveillance procedures and where they violated the tech specs or the Section 11, rather, they asked for a -- not tech specs, but Section 11 -- they asked for an exception verbally, and I think they told me there were five of those exceptions they had filed and the NRC had discussed it with them and had not turned them down.

Q Now, as I understand it, the Inspection

and Enforcement Division of the NRC inspects plants on a regular basis. Are you aware of that, sir?

A Yes.

Q And one of the things that they do when they inspect is to check conformance with the technical specifications; isn't that correct?

A That is right, but they also have a group down here that checks technically -- I assume they do. They get copies of them and I assume that they have technical people who are knowledgeable to go through them and determine whether they accept them or not, or are acceptable.

Q How does an inspector from I&E, when he comes in to inspect the plant, determine that the licensee is not in violation of the tech specs when there has only been an oral action statement filed with the NRC and someone's verbal agreement has been secured as to a modification of those tech specs?

A Well, they would find in our files or in the plant files a notation that this has been presented to the NRC. The NRC may still come back and say they do not accept it, but until they c me back and not accept it, the plant has to run, so they proceed on that basis.

Q So they proceed on the basis of an oral

action statement that is reflected in the licensee's file and may or may not be reflected in the NRC's file?

A That's right. I don't know what records they keep when the thing is discussed with them, but if they don't do these kinds of things, the whole world would stop because there are so many of these things going through that that is one of the problems, they just can't get around to all details that they should keep documents on, like that. The plant does, but the NRC, I don't know where they keep all the stuff they get now.

Q Is there a form for an action statement, a written form?

A I do not know.

Q But in any event --

A As I understand, on Unit 1 what they did was they sent the procedures down to the technical people here in Bethesda and after a period of time when they had studied it and then the group said they wanted to talk to them, and so they went down and sat down and discussed the procedures for surveillance, and it was at that discussion -- and I don't know what NRC had asked them to change and what they had found -- but it was at that discussion that they pointed out they cannot meet Section 11 on Unit 1, it is physically impossible to do

it while the plant is operating.

The only way -- so they said, "We would test those valves every time the plant is cold, we will test those valves," and this is what the verbal exception was, and not to do it every three months.

Q How often is the plant closed down?

A Oh, that varies. For the first year it wasn't closed down very much. That is hard to answer.

Q Well, it is more often or less often than once every three months?

A It is less often. It would come down cold -- at least it comes down about once a year for refueling when everything is cold, and it may come down once during the year where they have to cool things off. But I think that it is unlikely that they would unless there was something that forced them to do it. They can come down and fix lots of things without cooling off.

Q But just so we are clear as to Unit 2, they had not gotten an oral action statement agreed to by the NRC?

A On Unit 2, in their surveillance procedures, they set out to write their procedures to absolutely meet Section 11 of the ASME Code and in doing so we

think they violated some of their own tech specs. So they had a choice, they could only violate one or the other.

Q Now, using your handwritten notes which are Exhibit 4, you prepared the report that is marked as Exhibit 3?

A Yes.

MR. GORINSON: Let's take a five-minute break.

(A brief recess was held.)

Q At Page 1 of your April 18 memorandum, Exhibit 3, you mention that the surveillance testing coordinator delivers computer printout to control room outlining each test to be performed during the week.

A He is part of that group that is listed with Bashista.

Q Do you know what his name is?

A No. There are several of them there.

Q Now you say at the bottom of Page 1 and continuing on to Page 2, "Each test procedure requires closing both the EF-V 12-A and EF-V 12-B which isolates both emergency feed lines to the steam generators. In the event of a reactor trip while the surveillance

test procedure is being executed, those lines would remain out of service until the CRO opened EF-V 12-A and EF-V 12-B in the control room." Why are both valves closed during these procedures?

A Well, I tried to explain how this was developed, about that they hoped that they 11 valves would be tight so they could, say, start the 2-B pump, for instance, and develop pressure on this header (indicating) around here and that would put backpressure on these two nonreturn valves and they could then check them for leakage or tightness. Then they would shut this one down and start this one (indicating) and that would check this one. And basically what they tried to do was to meet the Section 11 code 100 percent, and if the 11 valves had been tight, that would have been a very logical and a beautiful decision.

Q I guess what I am asking is does this testing procedure require both valves to be closed simultaneously?

A Yes. If you look at the valve alignment sheets, you will find that for testing the B valve, they are both closed, and for testing the A valve they are both closed.

Q Could the test be performed without closing both valves simultaneously?

A You would have to rewrite the procedure, and this was suggested, that you close 5-A valve and 12 valve and then you can test the pump.

Now, to test the non-return valve, you close the 5-B valve and run the steam pump, and then you can put backpressure on that non-return valve.

Then you can run the 2-A pump and put backpressure on this non-return valve. But then that raises the question that by so doing you have got this system out and you have two pumps out and that doesn't meet the tech specs either.

Q Let's see if we can answer my question, which is: Could the test be performed without closing the 12-A valve and the 12-B valve simultaneously?

A It can be performed, yes, but it still has that question because you have to take two pumps out to do it.

Q Because it might violate the tech specs in so doing?

A Yes.

Q Was that procedure ever considered?

A It was considered after we raised the question.

Q So it was considered after the TMI-2 incident?

A Yes.

Q Do you know if it has been considered before the incident of March 28, 1979?

A No, I don't. Some engineer along the way may have thought of it but as we talked to them, we got the impression that they were looking at the 11 valves being tight and this developed the logic in which they were trying to meet that surveillance test, and indeed, in going back and reviewing the tech spec requirements, they went ahead and said, "All we need to do is close the 12 valves and then we can do the surveillance test." This is the logic they seemed to have gone through at that point. Now what they did before that, I don't know.

Q Now, let's look at Page 2 of your April 18 memorandum. The first complete paragraph where you talk about the completion of the test and what the auxiliary operator does with his check list is brings his check list back to the control room and directs one of the CRO's to realign valves to normal operating alignment, and you say this may be accomplished by the CRO assigned to relief shifts or by CRO operating shift or part by one or part by the other, does this sentence flow from the fact that you had been told that the procedure that day might have been done jointly by

Mr. Hemelia and Mr. Cooper?

A Yes.

Q Now, going further down that page, the paragraph that begins "Our preliminary view" --

A Yes.

Q And your preliminary view was, as of April 18, that those valves had been closed for 42 hours from March 26 to March 28; is that correct?

A Yes.

Q Is that still your view today?

A Yes. I haven't seen anything that changed my feeling that the set-up was perfect to miss them.

Q Just so I am clear, your second set says, "Based on existing documentation of the completion of the surveillance testing, Valves EF-V 12-A and 12-B were correctly repositioned opened." Is that sentence based solely on the existing documentation?

A Yes.

Q It is not based on your preliminary view of what actually happened?

A No.

Q Now, you also looked at the TMI-1 system; is that correct?

A Yes.

Q And you said that the TMI 1 is a simpler system.

A Yes.

Q How do you account for the fact that TMI 1 is a simpler system than they have on TMI 2?

A Because they threw -- NRC threw more requirements into No. 2 than were required for No. 1 and those are these bypass valves here.

Q You are referring to Attachment 4?

A 3.

Q Attachment 3?

A Yes.

Q And the bypass valves are numbered what on your diagram?

A 33-A and 33-B, and 32-A and 32-B.

Q And those are not present in TMI 1?

A No. The 12 valves are not present either.

Q Were the 12 valves the result of NRC requirements?

A Yes. To accomplish this bypass, they had to put the 12 valves in.

Q And what was the reason for the NRC requiring that bypass?

A Somebody raised the question about the control

valve not working, so they ended up requiring that they put in a bypass around them.

Q And that occurred between the time TMI 1 was designed and TMI 2?

A They tell me this occurred toward the end of the design on TMI 2.

Q About what time, can you tell me?

A I don't know. All I know is relative. It was after the design on No. 2 was far along they had to go back and add these.

Q And that was the result of a new NRC requirement?

A Yes.

Q Now you also say in the last sentence there that TMI in-service inspection groups are working on a revision to TMI 1 procedures that will require someone not part of the test group to verify valve alignments following each surveillance test.

A Yes.

Q Had they been working on that prior to the incident at TMI 2?

A I don't think so. I don't know for sure.

Q And where would that other person come from?

A I was told the other day that he was coming from

QA.

Q So it would be a Quality Assurance person to verify it?

A Yes.

Q And how would, if you know, that verification be shown? Would it be the third line on that test sheet that we were talking about before?

A No. I think they would undoubtedly make him a valve alignment sheet. See, they do run valve alignment surveillance tests on all systems periodically, and I would assume he would use one of those sheets.

Q To your knowledge has anyone since you completed your report done another investigation of the 12 valves?

A I was told no.

Q How did you give your report to Mr. Arnold, did you give him a verbal summary along with your written report?

A Yes. I discussed it with him when I handed it to him, told him -- he asked certain questions. I told him our opinions and what we thought they meant and turned in the report.

Q What kind of questions did Mr. Arnold ask you when you turned in your report?

A He talked more about our relationship and our discussion with the people and their response, and of course, he could assimilate for himself the technical part of it.

Q Well, what did he want to know about the people that you had spoken to?

A Our reaction to them and what we thought of them.

T4 Q Did he give you a reason as to why he was interested in that?

A Well, he was interested because they are operators and he doesn't know them personally that well -- probably doesn't know them at all -- and he wanted my opinion of what I thought of them.

Q Did he give you any specific reason as to why he wanted to know what you thought of it?

A Well, just a general opinion that someone in his position always likes to get a reaction to his people and other people's reaction. I would have done the same thing.

Q Was there anybody else present besides yourself and Mr. Arnold when you turned in the report?

A No.

Q Mr. O'Connor wasn't there?

A No.

Q Do you know if Mr. Arnold spoke to Mr. O'Connor about the report?

A I don't know whether he did or not. I don't think he did, but I don't know.

Q Afterwards did you and Mr. O'Connor speak about the report?

A I showed it to him. He had left when I had turned the report in, and then he came back on another assignment and I hung him up and gave it to him and I said, "This is the report I turned in. If you have any adverse reactions, I would like to hear about them." So he took it off and came back and said he thought it gave the picture accurately and he agreed with it.

Q Since that time have you and Mr. O'Connor ever discussed the report?

A We discussed it over the telephone generally some of the things at TMI and among other things, just incidental conversation.

Q What kind of things did you discuss about TMI?

A Well, we just reviewed what we had done before and discussed our discussion before and nothing new that we hadn't already discussed. It was just a review, more or less, of what we had done.

Q And what was the purpose of that review?
A Primarily to see whether he had had any change of views or not relative to the information we had gotten.
Q When was that telephone conversation, if you remember?
A Several days ago.
Q Had you and Mr. O'Connor worked together before you did this investigation?
A You mean on other jobs?
Q Yes.
A Yes, we worked on an Audit Committee for a couple of audits of the Oyster Creek plant together.
Q Let me see if I understand this. You had a telephone conversation a few days ago and you discussed TMI and your general views of TMI, state of your knowledge, just to see whether either one of you had changed his opinion about TMI?
A From what we reported, yes.
Q Was this just a random phone call or was there some other reason for the phone call?
A No. I wanted to talk to him because I didn't know he was coming down here, but I knew I was. So I called him to discuss it with him and I said, "You may

be called too," but nevertheless I wanted to review with him what we had done to be sure that he hadn't had a change of ideas that I ought to be aware of, and that basically was the reason for the call, among others. We discussed some other things too.

Q Now, you also said that you have been a member of the General Office Review Board of TMI; is that correct?

A Yes.

Q And you have been a member since 1975?

A I can't be specific when I got on that board, but at least that long.

Q It is fair to say that you have been a member for several years?

A That's right.

Q And the General Office Review Board considers matters relating to TMI 1 and TMI 2?

A It does now, yes.

Q When did it begin considering matters relating to both plants, approximately?

A Well, informally about a year ago the chairman said that we need to start getting up to speed on No. 2 and there was some discussion with the plant people and the construction people of an informal nature. That

was before the plant started to operate, of course. And then after the plant started to operate, it became a regular agenda item.

MR. GORINSON: Let me mark as the next exhibit a document entitled Three Mile Island Nuclear Generating Station General Office Review Board Minutes Meeting No. 28A, December 20, 1977. Attached to that are the meeting of minutes No. 28 dated November 12, 1977.

(The above described documents were marked, collectively, Miller Exhibit 6 for identification, this date.)

Q Do you have Exhibit No. 6 in front of you, Mr. Miller?

A Yes.

Q Now, the purpose of the meeting of No. 28A, December 20, 1977, was to review the reference document which was Tech Spec Change Request No.65; is that correct?

A Yes.

Q And you were present at that meeting via conference phone?

A Yes, I guess I was.

Q Could you describe for me what the GORB does

in reviewing a tech spec change?

A Well, they send a copy of the tech spec and mark changes, and then normally they discuss or ask anybody if they have any questions at the meeting. But in this case, time required a faster answer from GORB, so they reviewed then the point of the change over the telephone for some of us, and some of us were in the meeting -- some were in the meeting -- and so the technical question was discussed that way and a vote was taken.

Q What types of preparatory work would be done prior to a GORB meeting to consider a tech spec change? Would the tech spec be provided to the members of the GORB?

A Yes.

Q Would any other documentation be provided to the members of the GORB?

A Well, there is some explanation of the purpose of the change. I mean, that is part of the change, the way it is written up, and then it is up to the GORB member to read it, become familiar with it, ask any questions of the plant or whatever prepared it, at the meeting when it comes up before it is voted on.

Q About how long before a meeting would the GORB members be provided with a tech spec change?

A That varies. Sometimes a couple of months, and sometimes a couple of weeks. It depends on when the thing was released.

Q Let's look at the underlying document, the minutes of the meeting of October 12, 1977, Meeting No. 28. Now, it shows the attendees, members of the board, and I would like to, one at a time, go through them and see if we can identify them.

Who is Mr. Bartman?

A He is vice-president and chief engineer of Met Ed.

Q Mr. Finfrock?

A Vice-president of Generation for Jersey Central Power & Light.

Q Mr. Hurbein?

A Vice-president Generation for Met Ed Company.

Q Mr. Kulynych?

A He is a B&W representative. I am not quite sure of that, but I am fairly sure that that is who he is.

Q Mr. Lowe?

A He is at Pickert & Lowe, Consultants.

Q Mr. Montgomery?

A He is an engineer with the Service Corporation.

Q Mr. Reppert?

A He is an engineer with the Service Corporation.

I think he is secretary.

Q And Mr. Thorp?

A He is the chairman of the GORB and a manager of the environmental relations or affairs -- environmental affairs for the Service Corp.

Q So, to the best of your knowledge, Mr. Kulynych works for Babcock & Wilcox?

A Yes.

Q Now, the non-members that were present, Mr. Broughton?

A He is an engineer with the Service Corporation.

Q Mr. Lawyer?

A He is the manager of Generation, I think has been his title, with Med Ed.

Q Mr. J. G. Miller is Gary Miller?

A Yes.

Q And Mr. J. L. Seelinger is Jim?

A Yes.

Q Non-members part time, Mr. R. Benzilla?

A Right now I can't identify him. I don't remember. I think they are employees at the plant, but I can't think of their job.

Q Mr. Dubel we are familiar with.

A I am familiar with the name, but I am not familiar

with his job.

Jim Floyd, of course, you know.

Q Right. Mr. J. M. Hall?

A I can't identify his position either.

Q Mr. Hilbish?

A John Hilbish is in the Reading office. Now he works in the licensing and regulations group. He was, however, an engineer of TMI 1 before he came into Reading.

Q Mr. Chevlin we know.

Mr. Segren.

A He is manager, Segren is head of training.

Q Head of training?

A Yes. I don't know whether he is head or not, but he is one of the prominent people in training.

Q For TMI?

A Yes. He is located at TMI.

Q Now, this meeting, if you will look at Item 1, dealt with TMI 2.

A Yes.

Q Now, looking at the third paragraph down, it says "Delays have recently occurred in the initial fuel load date. Contributing factors to these delays include the change in construction contractor."

Do you see that?

A Yes.

Q What caused the change in construction contractor, as you know it?

A Well, near the end of the job -- they did this on No. 1 and they also did it on No. 2 -- United is a big operator and to do a lot of small jobs, they are not really that good at it. I mean, they don't like to do these finishing jobs. That has got to be done and there are modifications at the last minute, and there are relatively numerous small jobs, and they found it is better to get a smaller contractor who is geared more to do that kind of work, and that is why they changed contractor.

Q Who did they change the contractor to, do you remember?

A Catalytic, I guess, is the name of it.

Q On Page 2, the first full paragraph, second sentence, it says "Met Ed evaluates the level of knowledge of operators as adequate based on their performance in the classroom and on simulators." See that?

A Yes.

Q At that meeting was there any discussion, if you remember, as to the method of evaluation by

Met Ed?

A No.

Q Did the GORB ever raise the question with Met Ed personnel as to how operating personnel were being evaluated?

A Not in detail, no.

Q What kind of issues on operator training came up to the GORB from time to time?

A Primarily they discussed frequently the use of the simulators and getting people to the simulator training, and that was -- I remember most of the discussion was not about the details of the training program.

Q I see. So the conern was to get people to the simulator?

A Yes.

Q Why did the GORB feel that operators should be sent to the simulator?

A Well, it is the one way where you get hands-on experience.

Q Did the GORB ever request Met Ed personnel to explain why the nature of the simulator training its operators were receiving was --

A No, but the members of the GORB, they are quite

well familiar with what a simulator is and what it does.

Q Had any members of the GORB gone down to Babcock & Wilcox to evaluate the simulator training program?

A Well, I have been there and I have seen it demonstrated, but I didn't go through a detail of the whole program. But I am sure Hurbein has and Lawyer and Gary Miller have, and Seelinger. They are not members of the GORB -- Hurbein is.

Q Did Mr. Coolidge, from Babcock & Wilcox, explain what the B&W training program was?

A I don't think that is his area. I think he is in the nuclear area.

Q Did the GORB ever take up the subject of a transient which occurred at the Davis-Beese plant in September of 1977?

A Not that I remember. I know about it, but I don't remember that that was ever discussed.

Q You know about that transient?

A Yes.

Q When did you learn about that transient?

A I didn't learn about that until after we had the accident. There are a number of people in the plant

staff that knew about it because B&W has what they call the Owners' Group who own B&W reactors, and they get together periodically and discuss problems.

Q Who in the plant was a member of the Owners' Group?

A I don't think they have a specific member. I think that different engineers go depending on who is available at the time and what subjects will probably be discussed. There is an engineer in the home office, in Met Ed's office, Generation Division office, who goes quite frequently, named Steve Fritzen, but I think sometimes they send two other people from the plant if it is on a subject that they are particularly interested in. I don't think anyone -- I don't know that any one particular person is a member. Met Ed is a member of the Owners' Group.

Q To your knowledge, had the Owners' Group, prior to March 28, 1979, ever considered the subject of the Davis-Beese September 1977 transient?

A It was discussed when it happened, but how it was discussed, I don't remember.

Q As a result of it being discussed, was there any discussion in the GORB about the significance of that transient?

A No, not to my knowledge.

Q To your knowledge, was there any discussion in the PORC -- are you familiar with what the PORC is, sir?

A Yes. Not to my knowledge.

Q Was there any change in training procedures at Met Ed for TMI 1 or TMI 2 as a result of the Davis-Beese September 1977 transient?

A Not to my knowledge.

Q Do you know if, since March 28, 1979 anyone at Met Ed has gone back to determine what information about the Davis-Beese 1 September 1977 transient was disseminated throughout the TMI organization?

A Well, I was told at the time that it happened -- and it was reported -- that a number of people in Met Ed, in the technical group, were brought up-to-date on what happened, and there was, of course, a major difference between that -- that was on the early start-up and they were only at low power, so they didn't have the stored heat energy in the system that full power would have, and so basically it was a different condition that they had dealt with -- but other than that, I can't discuss it because I don't know enough in detail.

Q Who gave you your information about

Davis-Beese 1?

A Jeff Fritzen gave me some information on it. Bob Arnold told me something about it. He knew about it too.

Q Was this post the TMI 2 accident?

A Yes. I did not know about it until after that.

Q Now, it also says in that paragraph that the emergency plan drills held in September indicated that plants, procedures, and staff performance were adequate for operation. What review did the GORB make of those emergency plan drills?

A Don Reppert has a small group who monitored these and reported back to the GORB, and he is on the GORB, and that is the way GORB usually handles these things. They will appoint one or two members to make a specific study and report back.

Q Now, Mr. Reppert, would he prepare a written report to the GORB?

A Sometimes they do. In this case I don't remember whether they did or not. He may have considered this report in the minutes as that written report.

Q But other than Mr. Reppert's monitoring and his concurrence that it was adequate, there had been no other written no other written reports of this?

A I wouldn't think so. I am not aware of it if there is.

Q Now, in the next paragraph, talking about maintenance, it says there that a shortage of utility men assigned to maintenance is hampering housekeeping. What does that mean, sir?

A Utility men, I guess, is what you call the laboring group in the plant. They do the clean-up work. And there was a question of housekeeping around the plant and this was their explanation.

Q What was their explanation for the shortage?

A I don't remember. There has been -- well, in starting No. 2 and running No. 1 we have been adding personnel, and as the work picks up, to get the kind of people you want, frequently is not that easy, and you have got to train them because of where they work. It just isn't like going out on a street and hiring a laborer and say, "Clean this place up." So that I assume that they did not report, to answer your question, why, to my knowledge.

Q How much training is given to utility men at TMI?

A I don't know the specifics on that. I am sure they are taught safety.

Q Is that a one-day course or a one-week course of a one-month course or what?

A I can't answer that.

Q But the shorter the course, the more likely that you would be able to go out on the street and get somebody in the normal course of events?

A That is right.

Q Now, the next paragraph, it says "Maintenance access is more difficult than TMI 1." Do you see that?

A Yes.

Q Why was maintenance access more difficult at TMI 2 than at TMI 1?

A Because of the way it is arranged.

Q Could you explain that more for me? What do you mean by that?

A Well, No. 1 was designed and detailed and laid out by Gilbert Associates. No. 2 was designed and laid out, was determined by Burns and Roe. They are just two different organizations and they are designed differently.

Q And the Burns and Roe design made maintenance access more difficult?

A Yes.

Q Hadn't GPU Service Corporation discussed

that fact with Burns & Roe at some point earlier?

A I would assume that they had but when the transfer was made to TMI much of this design was already completed, and the decision was made at top level not to change it.

Q So the company accepted a plant where maintenance access was more difficult than at TMI 1?

A I would say yes, but I am sure they didn't do it with any knowledge that that was the case.

Q As of 1977 they knew about it?

A Yes, the plant staff knew about it.

Q And the GORB knew about it; isn't that correct?

A Yes.

Q And who does the GORB report to?

A The president.

Q Mr. Krites?

A Yes.

Q So Mr. Krites knew about it?

A Well, it was in the minutes.

Q And if Mr. Krites read the minutes, he would know about it?

A Yes.

Q Who does Mr. Krites report to?

A He reports to DeCamp, I guess, or does he report to Kuhn?

Q Would it be Mr. DeCamp or Mr. Kuhn?

A Yes.

Q And at some point would this be the kind of issue that Mr. Krites might take up with Mr. DeCamp or Mr. Kuhn?

A I am sure it could be discussed, but practically speaking, what can they do about it except train men to take care of it? There isn't anything you can do to change it.

Q So they had a plant where maintenance access is more difficult than at TMI 1.

What about this fact as reflected in your minutes of October 12, 1977: "And is expected to result in longer outages with greater man-ram exposures."

Do you see that sentence?

A Yes. I remember that discussion. There has been a lot of discussion about that.

Q Could you give me the substance of that discussion?

A Well, the way it is arranged, it just makes it difficult to get men in and out of these areas to do the maintenance work, and as a result there is going to

be more man-ram exposures, so there is going to have to be more men thanks to the man-ram exposures, but you are limited to each individual, so you have to have more individuals.

Q I see. There would be a greater man-ram exposure for what reason?

A Well, specifically, I can't answer that in detail, but it is the way it is arranged, where the equipment is located and how you get to it. You are talking about pumps and a waste treatment building, and that sort of place where this equipment gets radioactive and it is difficult to get a man in to work on it, and it goes slower. It means that he has a shorter time and somebody else takes his place.

Q Was there much discussion about the fact that this maintenance access would result in longer outages?

A Well, it was reported and everybody accepted it.

Q Were any solutions proposed?

A No one knew a different solution because you would have to reconstruct the plant to make it different.

Q Well, let's look at the next sentence where it says, "The staff is identifying these critical areas so that they may be, one, corrected at TMI 2 where

possible."

What type of corrections at TMI 2 would be possible for these problems?

A I can't answer that because I don't know the specifics, but I would imagine they, if possible, would make a bigger opening to get in and out of the place. They might improve the ventilation, they might improve the protective wall around pieces of equipment in the area to reduce the activity. I am sure there are many things that they would try to do if there is room to do them.

Q Do you know what they did do?

A I don't -- no, I don't. And I don't think they know at all what they are going to do at all either.

There is a growing process. As they do these jobs, they are going to find out how to do them better and better.

Q As of 1977 do you know what they did do?

A No, I don't.

Q This wasn't Burns & Roe's first nuclear power plant, was it?

A I don't think so. They worked on Oyster Creek for GE, and I am sure they have done other plants. They worked on Hannaford, didn't they? I am not sure

of that. Maybe I shouldn't say that. But I am sure they have worked on other plants.

Q Is maintenance access difficult at Oyster Creek?

A It is difficult. It is difficult in any nuclear plant, but relative to TMI 1 or TMI 2, I don't know, but that is a completely different kind of plant, so you couldn't compare them directly.

Q Looking toward the bottom of Page 2 there is a sentence where it says, "Surveillance procedures, when they are required to be performed, are more extensive and complex for TMI 2, although the TMI 1 requirements will be similar to those of TMI 2 with Unit 1's conversion to standard technical specifications.

Do you see that sentence?

A Yes.

Q Could you tell me what that means?

A Well, when the tech specs for Unit 1 were prepared, NRC did not have a standard. Each plant did the best job they knew how to do. Since that time NRC has developed standard technical specifications forms and requirements, and so No. 2 has been changed over to meet these standard technical requirements. But as of now TMI 1 has not, but it will when time permits.

Q You state there that the surveillance procedures are more extensive and complex for TMI 2. Does that arise from the standard technical specifications?

A I would say partly so, but also partly because it is a more complex arrangement.

Q What leads TMI 2 to be a more complex arrangement?

A That is the way Burns & Roe designed it, plus the fact that a lot of additions were added to No. 2, like this thing here (indicating), like this bypass on the emergency feed system was added to No. 2, and that makes your surveillance more complex.

Q To your knowledge were there discussions between GPU Service Corporation or Met Ed or Jersey Central and Burns & Roe as to why TMI 2 was more complex than TMI 1?

A I don't know the answer to that. As I say, No. 2 is designed largely for Oyster Creek to do and that was being supervised by Jersey Central.

Q So this was Jersey Central's decision?

A It was their job at the time the preliminary layout of this plant was made.

Q And it was their job to discuss these matters

with Burns & Roe?

A Yes.

Q Who in Jersey Central would have had that responsibility, if you know?

A Well, I believe it would have ended up with Finfrock, Ivan Finfrock, this guy up here (indicating).

Q Mr. infrock who is a member of GORB, I see. Did he have anything to say when these issues were being raised at the meeting, if you remember?

A No, I don't.

Q At any time, to your knowledge, did Mr. Finfrock have anything to say about the comlexity of the surveillance procedures at TMI 2?

A Not that I recall.

Q How about the maintenance access at TMI 2?

A I don't recall that. He probably did discuss that, but I don't remember.

Q How about longer outages, did he have anything to discuss about that?

A No, I don't remember the specifics of who all discussed that either.

Q And the greater man-ram exposure, did he have anything to say about that?

A Not that I know. There was a lot said about it,

but who said it, I don't remember.

Q The standard technical specifications, were those the specifications that became the TMI 2 tech specs?

A They were redone to meet the NRC standard technical specifications, yes.

Q When did the NRC, if you remember, adopt a requirement for standard technical specifications?

A I don't remember.

Q Were those technical specifications redone after the plant became operational?

A No, this was started, I think, before the plant -- before they were finished. Some of them they had to redo. That is the way I remember it.

Q In other words, they were not too far along to go back and pick up and redo?

A Number 1, of course, was all finished. That means a complete new job for No. 1 when they can get to it. That is a tremendous job.

Q The standard technical specifications, are those standard as to form?

A I can't answer the details of what is all included in those standards.

Q Let's go back afew pages on No. 6 where

the minutes of the meeting continued on October 13. Do you see that?

A Yes.

Q And one of the first things that was considered was that the GORB recommends Met Ed to continue to investigate the following areas, first, cross-licensing. What is cross-licensing, sir?

A For an operator to have a license in both units.

Q Why was the GORB concerned that Met Ed continue to investigate the area of cross-licensing?

A They were concerned that to require licensing both units might result in a problem of maintaining the quality of training and the quality of performance on any particular unit.

In other words, if a man operates one unit only, he gets familiar with that. But if he switches from that to another unit, there are some differences. They are not identical, even though in principle they are, but specifically in detail they are not, and this is a concern in requiring a man to be able to do that.

Q And did the GORB receive any assurances as to how quality would be maintained by Met Ed?

A I don't think that was answered, but they are giving that serious thought right now, whether they

will continue cross-licensing.

Q To your memory then, between October 13, 1977 and March 28, 1979, the GORB did not receive any assurances on cross-licensing from Met Ed?

A I don't -- no, I don't remember that. It is my impression thought that they are not now doing it.

Q They have stopped since March 28, 1979?

A Yes. I don't think that -- now, this is -- I have to qualify this. I can't be sure, but I -- it sticks in the back of my mind that they are not now requiring cross-licensing of operators.

Q Do you know when they stopped that?

A No, I don't.

Q Do you know the cross-licensing program at TMI was formulated?

A No, I don't.

Q Do you know how the testing for cross-licenses was prepared at TMI?

A What you do is you take a license on 1 and then you go and take the test and get a license on 2. That is what it means.

Q Do you know who administered the test for the second unit?

A The NRC administers all of them.

Q So, to your knowledge, it is the NRC that administers all the tests ever in a cross-licensing program?

A Well, Met Ed has their own test which they give these operators before they give them to the NRC to take their test, and if they can't pass the Met Ed test, then they don't send them to the NRC, but ultimately NRC, yes, gives them the test and determines whether they pass.

Q Were you ever informed that Met Ed had received permission from the NRC to conduct its own cross-licensing tests and certify the results to the NRC?

A I think the word "cross-licensing" means that you have an operator who has a license on two units. He really gets the license in a straightforward manner on one and then he goes and gets it in a straightforward manner on the other. You don't take a single test that says he has a license on both units.

Q Let me ask my question again. Were you ever informed that Met Ed had been delegated by the NRC the authority to certify by a Met Ed-administered test an operator already licensed on one plant as being qualified to operate the other plant subject to NRC

review?

A Not to my knowledge. The tests that Met Ed gives are for their own general information as to how the operator is doing and his capability, and we do that to prevent people going up and taking the NRC tests and flunking and wasting their time and our time.

Q Now, looking at (b), it says "Carryover of information for future projects from TMI 2 to Forked River in particular."

What kind of information was to be carried over from TMI 2 to Forked River?

A All kinds of information on design, training, administration, all information was to be looked at with that in view.

Q Were reports prepared or analyses of the type of information from TMI 2 that should be applied to Forked River?

A Specifically, I don't know. I don't think they had a standard way of passing this information over. There are representatives on the GORB and there are also representatives in engineering working on both, and this really has to be done at the engineering and operating level and not at the GORB level. But the GORB was interested in encouraging that this be done.

Q Encouraging that the experienced learned on TMI 2 be carried over to Forked River?

A Yes, not that GORB was going to do it.

MR. GORINSON: Mr. Trowbridge, I would like to request, if it is possible, that you let me know what form information on experience at TMI 2 took that was provided to the Forked River project and what the volume of that documentation would be.

Q Now, let's look at Page 6 of that October 13 meeting.

MR. TROWBRIDGE: What was the date of the minutes you were reading from?

MR. GORINSON: October 13, 1977, part of Exhibit 6.

Q At the top of Page 6, sir, do you see where it says, "In July B&W limited decay heat pump operation in recirculation to limits more restrictive than assumed in the FSAR"?

A Yes.

Q What was the reason for that?

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

Q Would that have been discussed at the GORB meeting?

A I am sure that it would have. I suspect B&W representatives would have presented their thoughts as well as the plant.

Q Would they have presented an analysis to GORB?

A Probably not to the GORB, but they probably gave to the plant engineering -- I don't know the details of how it was handed over.

Q Would plant engineering provide any information to the GORB?

A They would if it was pertinent or the GORB asked them for it, yes.

Q In this type of situation where B&W limits the decay pump operation to limits more restrictive than are assumed in the FSAR, would the GORB request an analysis?

A I don't know that I can answer that for all questions. I think that might vary on what the GORB thought about it when they heard about it.

Q Would that be the kind of issue that normally would come up to the GORB?

A Yes.

Q Why?

A If it has any connotation of safety involved, then

it comes up to the GORB, and if they determine, in discussion, that it is not safety-related, why then, they drop it. But if it is, they want to know more in detail of how to solve it.

Q Based on the discussion here, can you tell whether the GORB wanted further reports on this or whether this was the end of GORB perusal of the issue?

A Vaguely I remember this has to do with material in the pump shaft, and if you run it for a certain period of time, why, it breaks, and it says here -- and now it refreshes my memory -- that the plant did say when they can they are going to replace the pump shafts with one which they would expect to give a better life.

Q Have they done that?

A I can't answer that.

Q If they had done that, would that be reported to the GORB?

A I would say they would report in their plant report to the GORB that, yes, they had done it. But that varies on the situation.

Q You say a plant report to the GORB. Would that be the PORC minutes?

A No. There is always an operating report to the GORB from the plant forces.

Q How often does the GORB get that report?

A Every time they have a meeting.

Q So there is a plant operations report that is provided to the GORB?

A They bring up pertinent items which they feel the GORB should know about.

Q Is that report in writing?

A I think that varies. It depends on what the report is. It should become part of the minutes. I saw a reference to it. Frequently these are reports given to the GORB. Here is one by O'Hanlon, for instance, the status of solid waste disposal problems, and O'Hanlon, at that time, was TMI 1's superintendent.

Q I see. So that would be the kind of plant report in writing to the GORB from the plant?

A Well, it varies with what the subject is, but they do hand out written reports where the subject requires it.

MR. GORINSON: Off the record.

(Discussion held off the record.)

MR. GORINSON: Let me mark as the next exhibit minutes of the Three-Mile Island Nuclear Generation General Office Review Board Meeting No. 29, February 22, 1978.

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

Q Now, you will note, Mr. Miller, that it lists you as not being present. Do you see that?

A Yes.

Q In the event that you were not present, do you still receive a copy of the minutes?

A Yes.

Q So you would have received a copy of the minutes?

A I should have, yes.

Q And if you received a copy of the those minutes and you had any questions about anything that was raised in those minutes, what would be your procedure?

A I would call up and start asking people questions and then at the next meeting, unless I got the answers to suit me, why then, it would come up then for discussion when we review the minutes.

Q Let's look at Page 2 of these minutes, toward the bottom, the paragraph that starts "The STS requires the TMI 2 PORC be implemented slightly differently than TMI 1." Do you see that paragraph? It is the second from the bottom.

A Yes.

Q The last sentence of that paragraph says, "The GORB was assured that there is plenty of cross-communications between the TMI 1 and 2 PORC committees at the chairman and vice-chairman level."

Why did the GORB need that assurance?

A Well, they wanted to be sure that what was learned on 1, or a problem on 1, would be reviewed also on 2, and that is basically why the question came up. And then they assured that these get -- the same people on -- some of the same people are on both PORCs.

Q Was there any reason to believe as of February 22, 1978, that there was less than plenty of cross-communication between the TMI 1 and TMI 2 PORC committees?

A I don't think so. I think the subject came up and the PORC all at once realized this was important to them and they raised the question and asked for some assurance. I had never heard that this had been seriously discussed before as a problem. They wanted to be sure it wasn't a problem.

Q So it was more the negative than the positive, they just wanted to make sure there was no problem?

A Yes.

Q Let's look at Page 3 where it says, "Carry-over of information to the Forked River project," and as of that date, February 22, the lines of communication had been established according to the minutes. Now it then says, "Information on all design deficiencies will be sent to JCP&L and the Forked River project."

What design deficiencies does that refer to?

A Well, anything on No. 2 that had to be fixed up or changed or was not adequate they would notify them so that both Jersey Central and Forked River project group were aware of it.

Q Were there any particular design deficiencies that were discussed at that meeting, to your knowledge?

A No, I can't remember. I wasn't there.

Q Was it conveyed to you later on that there were any design deficiencies discussed at that meeting?

A Not that I recall.

Q To your knowledge was information on all design deficiencies sent to JCP&L?

A I don't know. I would hope so, but I don't know.

Q You don't know whether the GORB followed up on that?

A No, I don't.

Q And the next item is cross-licensing again.

MR. TROWBRIDGE: What is the date on these?

MR. GORINSON: February 22, 1978.

MR. TROWBRIDGE: That was Exhibit what?

MR. GORINSON: Exhibit 7.

Q Now, it refers in that paragraph to training that will concentrate on weaknesses shown on the requalification exams. Do you see that, sir?

A Yes.

Q Has there been any further discussion in the GORB on weaknesses that have shown up on the requalification exams?

A Not that I recall.

Q Have any weaknesses shown up on the requalification exams?

A I can't answer that.

Q Have there been any reports to the GORB on weaknesses on requalifying exams?

A Not that I recall.

Q And it says there, "It is Met Ed's intent to rotate these cross-licensed people on both units as needed." Was any objection raised to that by anyone on the GORB?

A Not at that time, no.

Q You say "Not at that time"?

A Not that I know of. I don't remember. But I don't recall that it has come up as a subject for discussion in GORB since then.

MR. GORINSON: Let me mark as the next exhibit a memorandum to J. G. Hurbein from J. R. Thorpe, Chairman, General Office Review Board, dated April 6, 1978, subject safety evaluation review.

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

Q You will note, Mr. Miller, that on the "cc" list your name is shown. Do you remember receiving a copy of this memorandum?

A I don't remember specifically, but I remember similar subjects coming up at different times and that I remember similar letters of this on different subjects being passed through by Hurbein to Thorpe, through Hurbein, but I don't remember this specifically.

Q Do you have any reason to believe that you would not have received this memorandum if you are shown as being sent a copy?

A Well, I am sure that I must have received it, and if I did, I read it, but that doesn't mean I can remember

specifically.

Q In the third paragraph it says that "Approximately 25 percent of the PCR documents reviewed continue to conclude that no adverse nuclear safety impact will occur without supporting documentation." Do you see that?

A Yes.

Q Now, had this occurred before?

A I would assume from the tone of the memorandum that it has.

Q Had it usually been considered by the GORB?

A I am sure that it has. I can't remember specifically, though.

Q You can't remember specifically. Let's try generally. Do you have any general recollection of this issue being considered by the GORB?

A Generally, yes, this is what GORB is for, to consider safety evaluations and reviews, many things.

Q And this is the chairman of the GORB informing Mr. Hurbein who is the vice-president for Generation; is that correct?

A For Met Ed.

Q That approximately 25 percent of the PCR documents continue to conclude that no adverse nuclear

safety impact will occur without supporting documentation.

What force does a GORB memorandum such as this have on Mr. Hurbein?

A He is expected to respond.

Q I see, and if you will look at the hand-written note below where it says, "Jack, I am in favor of cutting back on all the paperwork we can. If the NRC is not complaining about inadequate documentation, I think the GORB should agree it is okay."

Do you see that?

A Yes.

Q Is that the extent of Mr. Hurbein's obligation to respond to the GORB?

A That is not Hurbein's note.

Q Whose note is that?

A Bartman.

Q Mr. Bartman is who?

A He is vice-president and chief engineer of Met Ed.

Q And he has no obligation to respond to the GORB?

A No. He was just making a suggestion to Hurbein. I am sure Hurbein didn't respond or that that guy knew what he would do.

Q Do you know if Mr. Hurbein responded to this

memo?

A No, I don't.

Q If that memo was responded to, would that be contained in the GORB files?

A I would say yes, but that doesn't necessarily mean that all the members would necessarily see it. Ultimately it should get back into a report to GORB in some form or another, but I wouldn't know how to identify it at this point.

MR. GORINSON: Mr. Trowbridge, we have not seen a response in the documents we have received so far.

MR. TROWBRIDGE: I am not sure that there would be a response to this.

MR. GORINSON: By Mr.Hurbein. And we would like, please, for GPU to check as to whether there is a response.

Also, it refers to a memo of July 8, 1977 in that same memorandum. We request a copy of that memorandum as well.

Since Mr. Miller has to catch a plane yet home tonight, we will recess this deposition at this point and Mr. Trowbridge and I will make arrangements for a second session with Mr. Miller.

MR. TROWBRIDGE: I don't know when. You don't want to set a date now while Mr. Miller is here?

MR. GORINSON: No. I will take that up with you.

(The deposition was adjourned at 6:15 p.m.)

_____
JOHN G. MILLER

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

_____
Notary Public

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# INDEX



# EXHIBITS



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

I, STEPHEN McCRYSTAL, a Notary Public of the State of New York, do hereby certify that the foregoing deposition of JOHN G. MILLER, was taken before me on the 5th day of July, 1979.

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

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

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

IN WITNESS WHEREOF, I have hereunto set my hand this 8th day of July, 1979.

STEPHEN McCRYSTAL

----------x

PRESIDENT'S COMMISSION ON THE

ACCIDENT AT THREE MILE ISLAND

----------x

CONTINUED DEPOSITION of GENERAL PUBLIC UTILITIES SERVICE CORPORATION by JOHN G. MILLER, held at the offices of the President's Commission on the Accident at Three Mile Island, 2100 M Street, N.W., Washington, D.C., on the 9th day of July, 1979, commencing at 3:45 p.m., before Irwin H. Benjamin, a Certified Shorthand Reporter and Notary Public of the State of New York.

GENERAL PUBLIC UTILITIES SERVICE CORP.:

SHAW, PITTMAN, POTTS & TROWBRIDGE, ESQS.
1800 M Street, N.W.
Washington, D.C. 20036

BY: ALAN R. YUSPEH, ESQ.
of Counsel

COMMISSION:

STANLEY GORINSON, ESQ.
Chief Counsel

JOAN GOLDFRANK, ESQ.
Associate Counsel

ALSO PRESENT:

WILLIAM BLAND

o0o

J O H N G. M I L L E R , having been previously duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION (Continued)

BY MR. GORINSON:

Q Mr. Miller, you realize you are still under oath?

A Yes, sir.

Q Just so we can go back and clear up some

things we discussed the other day, one of your comments was that the Standard Technical Specifications adds work, something along those lines.

Why would a plant such as TMI 2 that utilizes Standard Technical Specifications have more work associated with it than a plant such as TMI 1, which does not have Standard Technical Specifications?

A I cannot answer that in detail. All I know about the subject is listening to the people talk in their reports to GORB, and also talk amongst themselves in the office.

Q What people?

A Engineers who are working on these tech specs.

Q Would Mr. Kunder be one of those people?

A No. Mr. Kunder -- yes, he would be affected, but he is in the Operating Group. He is superintendent of Technical Operations now for 2. He was for 1.

Q Well, which people then?

A Well, the engineers at the station who work on tech specs.

Q And do you have the names of any of those people?

A No, I don't.

Q Who do those people report to?

A It is Technical. I would say certainly Kunder is involved, and for TMI 1, and it is the fellow that took his place, Potts.

Q How about Gary Miller, is he involved in that?

A He is the top administrative man for the operation of the plant, and he would only have general supervision over the effort.

Q In his position as station superintendent, would Gary Miller be advised of problems in implementing a Standard Technical specification?

A I am sure he would.

Q We also discussed computers, and the Bailey 855, which was included as part of TMI 1, and as part of TMI 2. Do you remember our conversation on that point, sir?

A Yes.

Q Now, as I remember it, the Bailey 855 was selected for TMI 1, and then was selected again for TMI 2, is that correct, sir?

A Yes.

Q And that there is a modification program underway for TMI 1's Bailey 855 computer, is that correct?

A As a replacement.

Q As a replacement?

A Ultimately, yes.

Q It is a three-phase program, is that correct?

A Yes.

Q When, approximately, was the computer selected for TMI 1?

A Well, with your permission, I would like to go back to before TMI was purchased relative to computers.

Q Sure, but can we just define that time frame first.

MR. YUSPEH: Could you repeat the question?

(Reporter read back question.)

Q Have you got a time frame?

A It was selected at the same time we were purchasing the nuclear system.

One of the decisions we had to make was what kind of a computer system we were going to have or were we going to have any.

Q About what time was that?

A Around '66 or '67, as I recall.

Q I believe there was something you wanted to add, sir.

A Well, before that time, the industry had purchased computers, and by and large they had been somewhat of a catastrophe, primarily, because the manufacturer supplied them and was not prepared to provide the software to make them work, and the experience at the time that TMI was purchased was sort of mid air. We had purchased computers for Keystone and the Conemaugh plants, and they turned out to be more or less of a disaster until the utility put together their own crew to take care of the computers and the software system.

We had that experience in back of us at the time we were deciding on the computer for TMI.

Ordinarily, we would like to buy the computer from the nuclear supplier because one of the things we wanted was the fuel program, and since Bailey is a subsidiary of B&W, and B&W was committed to write a fuel program to fit their computer, that was one reason why the 855 was purchased.

Other companies who had more experience in computer systems probably than we did, had already developed their own staff for designing computer systems and the software, and some of those did not take the Bailey 855, but went with other computers and wrote their own software.

We were not prepared to go that far at that time in writing the software, and so we bought the B&W package, which included the 855 computer.

And I would like to point out at that time there was no proven computer system in service, either for fossil plants or nuclear plants. There were a number of them put in, but it all failed to perform according to expectations, and they were a source of a lot of trouble, not only ours, but other utilities also.

So that the point I want to make is, when we bought the 855, we think we bought as modern a system as there was available at the time.

Q Just so I can clarify, sir, you have some handwritten notes in front of you. Do those handwritten notes present the source of the comments you have just made?

A No. These are notes I made on the way down here to just refresh -- I was thinking this thing over, and I wrote these notes down.

Q Did you refer to any documents in preparing those notes?

A No.

Q This was just an attempt to refresh your recollection, is that correct?

A Yes.

Q Now, you said, I believe, that at least in part, that there were certain other systems available at the time.

A Not for B&W computers. They had to be developed after the purchase.

Q This would be the software?

A Yes.

Q There was other hardware available?

A Yes. One company bought GE's computers, and wrote their own software.

Q To your knowledge, at that time there was no other company providing software for B&W systems?

A That's right.

Q Now, I missed something you said before. You said with respect to the software, that at least with respect to a particular system you were not prepared to go so far in the area of software. Could you amplify that?

A We did not have the staff to write our own software.

Q So you had --

A We had to depend on the supplier to prepare the software at the time. Ultimately, we found that we

did have to prepare a lot of the software, and had to redo some of it, and had to refit it, and there were lots of problems with it, but at the time we made the purchase, the software was part of the purchase.

Q You had to do this even though B&W had the software available to fit their system?

A They did not really have it available. They committed themselves to provide it, so they were prepared, presumably prepared, to write the software after they sold the computer system.

Q Had B&W provided software for other plants prior to the time that Met Ed purchased TMI 1?

A Not to my knowledge, not nuclear plants.

Q So, in effect, then, B&W prior to the time that Met Ed purchased the Bailey 855 had not supplied software for nuclear power plants, is that correct?

A I think that's correct. They were in the process of working on it, writing the programs. One of the programs we wanted was the fuel program.

Q Fine. Let me go back to my original question.

If B&W had not in the past provided software for its Bailey 855 computer, and, in fact, would have to develop it for TMI 1, what led Met Ed to select

the Bailey 855 computer above all other systems for TMI 1?

A It was a package system that was proposed to us to buy. There was no other system proposed to buy. It would have meant that somebody would have had to develop the software for somebody's hardware.

Q You mentioned before that GE had provided hardware in the past?

A Yes.

Q Had GE also provided software?

A Only some executive software, but the fitting of the software to a specific plant had to be done by the utility or somebody that they hired to do it.

Q Did Met Ed or anyone in GPU talk to other computer companies about providing hardware?

A We had experience with other companies. We had other plants, and we had experience with other companies in dispatch systems. We had, I would say, limited experience, not enough that we were prepared to do our own software or design our own systems, which is why we depended on B&W as the supplier of the nuclear system to provide the computer system.

Q Focusing on TMI 1, did anyone at Met Ed or anyone at GPU talk to any other computer company about

supplying hardware?

A We talked to the engineer, the architect engineer, and they made a review of available systems, and the offering that B&W was making, which was a functional offering, and their recommendation was to purchase the Bailey system along with the nuclear package.

Q Is the architect engineer you are referring to Gilbert Associates?

A Yes.

Q Is it fair to say then that no one at GPU or at Met Ed explored the question of purchasing another computer system with another computer company?

A If it was explored, it was only explored in a preliminary way. We didn't go out and get bids.

Q Who would have had responsibility for making the decision on what computer system to use?

A I did.

Q And you made that decision after having Gilbert Associates do a review?

A Yes.

Q And Gilbert Associates' conclusion was that the B&W system was the system that should be used?

A Yes.

Q And what did they base that conclusion on?

A Their own studies, and their own knowledge of other suppliers of computer systems relative to a specific plant like the B&W plant.

Q Did they provide you with a written analysis documenting the results of that review?

A I am sure it is in the minutes of some meetings, but other than that, I don't recall.

Q You say in the minutes of some meetings. Were your meetings with Gilbert Associates minuted?

A Yes. Most of them were.

Q And what time frame would that review have taken place, would that be '66 to '67?

A Somewhere in that area.

MR. GORINSON: Mr. Yuspeh, I would like to request any minutes of meetings between Mr. Miller or someone representing the company and Gilbert Associates relating to the question of the computer system to be used for TMI 1.

MR. YUSPEH: Mr. Gorinson, I presume you only want us to work with Met Ed to the extent that they have it available. If you want to make a similar inquiry of Gilbert Associates, I presume you will do so.

MR. GORINSON: That's right; Met Ed or GPU,

or the constituent GPU companies, whoever was responsible at that time.

Q When was a decision made to purchase the computer for TMI 2?

A At the time it was decided to buy a duplicate unit.

Q And when was that?

A I don't know exactly, but I would think in the '68 area, somewhere around there.

Q When you say "duplicate unit," you mean Oyster Creek 2 or when the decision was made to move Oyster Creek to TMI?

A When they decided to buy a B&W duplicate of TMI 1 for Oyster Creek 2.

Q The process was exactly the same as you have described it for TMI 1?

A Jersey bought the reheat cycle with their turbine cycle, which is the primary -- the only major difference at that time.

(Continued on Page 123.)

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Q When you say the recycle with the turbine cycle, what do you mean by that?

A The steam flows through the high pressure turbine, back into a reheater, where the temperature is raised to a higher temperature, and then fed into the low pressure turbos. That's what is called reheating the system after it flows part way through the turbine.

We do not do that on Unit 1.

Q Does that relate to the computer system?

A In detail in does, particularly on balance of plant. Any pickups on balance of plant would be different, otherwise the fuel system wouldn't be any different, the nuclear system wouldn't be any major difference.

Q Do you know whether Jersey Central undertook a review of what computer hardware was available before determining to buy the Bailey 855?

A I do not.

Q Do you know whether they undertook a review of computer software that was available before deciding on that system?

A I don't know.

Q Did anybody in Jersey Central discuss with

you prior to Jersey Central's decision to buy the Bailey 855 what your decision making had been in arriving at the decision to buy that computer?

A I don't recall that they did.

Q Do you have any knowledge as to how the decision was made to buy the Bailey 855 for TMI 2?

A Well, generally, I understood that they had gotten bids for duplicates of TMI 1, and had gotten bids from GE and Westinghouse for nuclear systems, and made the decision after they made that comparison. I don't know that for a fact, but that's my general recollection that they did that.

Q When they made the decision to buy B&W's nuclear system, they also made the decision to buy B&W's computer system?

A That's right. I think their bid was on the basis that it would be a duplicate.

Q So that the nuclear system supply system would be accompanied by a Bailey 855 computer?

A I am sure that that was part of their decision and part of B&W's offering.

Q When did Met Ed or GPU Service or whichever company had particular responsibility for it, realize that it would be necessary to modify the

Bailey 855 system in TMI 1?

A Well, sometime in the late '60's, long before the TMI 1 was started, we had started up the Keystone station and the Conemaugh station in Horman City, and the troubles that were developed there led us to acquire qualified people and set up our own nuclear group.

Then, when the 855 computer for No. 1 unit was put on test, our people, the engineers that we had acquired, reviewed the computer system, and the computer hardware, and recommended, and that was accepted, that we bring into Reading to set it up in its own little room, and run through all the systems, and the softwares that were developed, and that was done before the unit then was shipped to Mile Island and installed there.

In the process of this development, it became evident to these experts that the computer itself had limitations.

The experience at Keystone and Conemaugh also showed us limitations on the single computer systems, and so they began to recommend that we consider a redundant system with a backup main frame computer, and the thinking was begun before TMI 1 was started,

that this is the way we wanted to go, but to make that change was a major operation, and that could not be made without interferring with construction startup and operation, so that's why it was done on a three-phase basis.

Q When did the experts reach the conclusion that it would be necessary to replace, ultimately, the Bailey 855?

A Well, by the time the unit was started, that computer was six or seven years old, and it only has a life of 10 years. So it was apparent that the life of that computer was going to be short after the plant started operating, and that in itself is a major inducement to consider what replacement you are going to put in, because -- and besides, Bailey does not make the 855 computer anymore, so their spare parts situation became critical, and that also was an inducement to replace it.

But as the operators then started to run the plant, and the computer was such an important aid to them in operating the plant, why that also encouraged us to move in the direction of a replacement.

Q Let us go back to my question.

When did the experts decide that that

computer, the Bailey 855, was insufficient?

A I don't know exactly the date, but I would say it was from '68 to '71 period, in there, that they were developing the software, and installing it, and putting it in service.

Q So it is fair to say then that sometime between 1968 and 1971 the experts who had become employed by GPU or Met Ed had determined that the Bailey computer was insufficient for the job it was supposed to do?

A And also its life was limited.

Q When that decision was reached that the Bailey 855 would have to be replaced on TMI 1, was there any attempt made to change the computer system that would be in TMI 2?

A Yes. They added a minicomputer to help out the 855, and it did give some assistance to the 855 to improve its operation, particularly in the area of balance of plant, and that was done about during this same period.

Q In the period, though, between '68 and '71, whenever that decision was made, that something would have to be done about the Bailey 855 that was going into TMI 1, did Met Ed or GPU Service Corporation

undertake any steps to find a different computer to go into TMI 2?

A No. because the decision was what we had found to replace 1, we would use on 2.

Q How far along was TMI 2 in terms of construction by 1971?

A I don't know when the computer system was delivered, but I would suspect that it was delivered somewhere in that period of time and set up and tested out. It was on the site shortly after that.

Q So the computer system for TMI 2 was on the site several years before TMI 2 began operations?

A Yes. It had a setup in its own separate room, and tested out the same as Unit 1 was, and that's when the minicomputer was added to it.

Q Now, TMI 2 didn't come on line until 1978, is that correct?

A I think that's about right. Actually, it came on in '77 for testing.

Q Okay. But it got its operating license in February of 1978?

A Yes.

Q By 1978, was Babcock & Wilcox still manufacturing the Bailey 855?

A No.

Q When did it stop manufacturing the Bailey 855?

A I can't answer that specifically, but sometime in the early '70's.

Q So that TMI 2 had a computer in it, which was no longer manufactured by Babcock & Wilcox?

A That's right.

Q Or Bailey?

A That's right.

Q And were replacement parts for that computer readily available?

A B&W and Bailey had assured us that they would get parts available, and so far they have done that.

Other companies also have installed 855 computers since that date, and that was purchased before they quit manufacture of the 855.

These things don't just quit all at once, they make a decision they want to quit, and then they taper them off over a period of time, and what all goes on during that period of time depends on the situation.

Q Could you explain the rationale that led Met Ed or GPU Service Corporation to buy the Bailey 855 computer and take delivery of it some seven to 10 years

before the plant went on stream?

A I don't think I said we took delivery from seven to 10 years before the plant went on stream.

Q When did you take delivery?

A Sometime in the late '60's, or around '70, in that period somewhere, and it was brought into Reading and set up for tests, and one reason that they did that was that our computer people said they wanted to test it out completely before we put it in the plant, and they found lots of things that they had modified in the hardware during this test, and we did the same thing for 2.

Q That was in the late '60's to about 1970, somewhere in that time frame?

A Somewhere in that period, I don't know exactly when.

Q And when did the company take delivery of the Bailey 855 computer from Bailey?

A Well, I would say around '70, '69, '70, in that period somewhere. I don't recall the exact date.

Q And this computer had a 10-year life?

A Yes, from the day it was purchased. That guarantee -- the computer was manufactured and set up in Bailey's shop for test, and we observed the beginnings

of those tests, and from what we saw we decided to take delivery and set it up in our own shop and test it out, and all of that was using up time, and I think as of today, the computer is over 10 years old.

Q But again, if I could come back to my question: What was the basic rationale that led the company to accept delivery of the computer system several years before that computer system would be needed in the plant?

A I think if you will investigate other companies who buy computers and who have their own software departments, that they take computers early and test them out several years before they want to install them, because the computers, when it is installed, must be a going system, and it needs to be tested out at some point before it is installed, and that takes months and months to do that.

So they always take several years before the plant starts.

Q You said companies that have their own software departments. As I understood it before, Met Ed did not have that capability, which was one of the reasons they asked Babcock & Wilcox to develop the software.

A We did not when we made the purchase, but we got into it very shortly. We never had sufficient personnel to do our own software. We had some computer experts on hand who were capable of testing computers, and also testing software, but we did not have a complete software staff.

Q At the time that the company took delivery of the Bailey 855, did it realize that that unit would have to be modified or replaced within seven or eight years?

A Yes, because the life of computers is only about 10 years, I don't care whose it is. Anybody that puts computer systems in are in the process of replacing them after 10 years or so.

Q To your knowledge, is that the normal purchase pattern in the nuclear utility industry?

A I don't know whether it is normal or not. Our people tell me that that's what we have got to tune up to do.

Q To purchase a computer several years in advance of the time that you actually need it?

A And to replace them periodically.

Q Right, but the question I am asking is, is it normal and usual practice in the industry, as

you know it, to purchase computers several years in advance of the time that you will need them?

A I don't know what you mean by several years. Three or four years, yes. It takes a year or so to test one of them out. They have to be set up at some-place other than the plant and tested out, or the plant has to be built far enough in advance for them to be installed in the plant, but they don't like to do that on account of the construction dirt and things that are around.

Q Well, after the computer is tested out, what is the usual time span before a computer is put into a plant that is under construction?

A The computer should be tested out in place, in the plant, before testing begins, and that's months and months before the plant is ready to operate, because the proper way of testing systems in a plant is using the computer, so that normally, the schedule is that the computer is in, tested out, ready to work some 15 months ahead of the operating date.

(Continued on following page.)

Q 15 months ahead of the operating date. So that if the TMI 2 computer was delivered sometime in 1970 and tested out, was the original starting date for that plant operational date supposed to be sometime in '72 or '73?

A We had a number of starting dates, and then they were postponed because of construction delays. I don't know how the computer was varied in those change of dates. As it turned out, the delays in construction were such that we had ample time to install the computer.

Q The delays of construction were substantial, weren't they?

A Yes.

Q Were any attempts made to change the computer hardware, given the fact that the delay in construction was substantial?

A No.

Q Were you familiar with the reasons for the substantial construction delays?

A At the time I was, yes.

Q And what were those reasons?

A There were hundreds of them.

Q What about the major ones?

A They just didn't get the equipment installed,

the piping systems, the major equipment, the foundations were delayed, and everything was delayed; nothing came as far as it should. Licensing caused some changes, which caused delays.

Q Was that a function of slow contractors or were there other reasons?

A There were many reasons.

Q What were some of the substantial reasons?

A Well, changes in the engineering were some, and slow performance of the contractors, difficulty to get craft labor in critical areas. Some trouble were supplies, equipment being delivered on time. B&W had a major delay in the delivery of the reactor vessels.

Q Were any delays caused because the company was short of funds?

A No.

Q Were any delays caused --

A Are you talking about one or two now?

Q I am talking about two.

A Two was intentionally delayed because of, I think, this is '73 and '74, because of the flatening of peak loads, and they cut out all overtime, as I recall, and stretched out the schedule because of the end date. They didn't see that they needed it when they thought

they did before. So they rescheduled it, in effect, ror a later date.

Q What do you mean by "peak loads"?

A The utility peak loads. You put these units in, and they carry your electric system peak loads.

Q And there would be no need for that capacity at the time it was originally thought?

A That's right.

Q And so the TMI 2 completion date was pushed back as a result of that?

A That's right.

Q Did lack of financial resources play any part in that decision as far as you know?

A Not to my knowledge.

Q Did you ever hear that a lack of financial resources may have played a part in the decision to push back the completion date of TMI 2?

A I am sure that financial resources always play a part, but I also am sure that if the capacity had been needed, that somehow they would have found the financial resources to put it in. But when they rescheduled the construction date, they rescheduled their need for financial resources.

Q On Thursday we were discussing the question

of cross-licensing that had come before the GORB.

A Yes.

Q To your knowledge, who is respon-ible for training at TMI 2?

A The ultimate responsibility was Hurbein. Under him would have been Gary Miller, and then Jim Seelinger for a long period of time was responsible for the training program and development of the program.

Q Jim Seelinger was responsible for the development of the training program?

A When he first came there, that's what he worked on.

Q Between when and when was that?

A I can't give you that date.

Q Is there somebody specifically responsible for training at TMI 2?

A Well, yes.

Q Who was that?

A Well, the superintendent is the one that is specifically responsible to see that the people get trained, and to see that their schedules are set up and to oversee that, and there are people under him that carry out the scheduling, and a number of people work at that. I can't name them now, but the responsibility

is the unit superintendent.

Q So at TMI 2 that would be Joe Logan who would have that responsibility?

A Yes.

Q There is a Training Department at TMI, is there not?

A Yes.

Q Who is the head of that Training Department, if you know?

A Well, as of now, I think he reports to Seelinger, and I think -- I don't know who is doing it right now.

Q Do you know what the qualifications are of the person who heads up the Training Department at TMI 2, or at TMI?

A One man, I can't think of his name, we hired from Penn State, who is a teacher, basically, and he is sort of the lead instructor, as it were, and he is what I would call a professional teacher. But he came out of the nuclear program of Penn State.

Q Had he had any experience in commercial nuclear reactors?

A I can't answer that.

Q Had he had any experience with B&W reactors?

A I doubt that, but I don't know.

Q Do you remember the person's name?
A I ought to, but I can't. I can't do it right now.
MR. GORINSON: Can we get that?
MR. YUSPEH: We can get, for the record, what period of time this person was there. This is apparently one person out of a number.
Q Tell me the period of time.
A He was there several years before TMI 1 was started, and he is still there, this particular man I'm thinking of. Seelinger was heading up the program, but this guy was working under Seelinger at that time.
Q Was this gentleman doing the actual training of the operators?
A He was supervising the people who were training and helping them prepare their lessons, scheduling the training, and that sort of thing, as a professional trainer.
Q Is it fair to say he was substantively handling their training?
A Yes.
Q And he is still doing that today, to your knowledge?
A Yes.
Q And he was responsible for the training during

the cold licensing period?

A He had his level of responsibility. Seelinger was the guy that was really responsible for getting them trained.

Q Seelinger had ultimate responsibility in that area?

A Yes.

Q But this gentleman had the day-to-day responsibility?

A That's right.

Q Did he have this responsibility during the cold licensing period?

A I think so.

Q And to your knowledge, was this person ever sent down to B&W for training?

A I am sure he was. I don't know specifically, but I think everybody was sent down. In fact, some of those trainers have their license.

Q Some of the trainers?

A He doesn't have a license, but some of the instructors do have licenses.

Q Some of the instructors have a license on TMI 1 or TMI 2?

A I don't know which unit, but I was told that at

least two of them had licenses.

Q Do you know what goes into the mix which determines which instructors get licenses and which don't?

A I think at one time they were thinking of trying to get them all licensed, but I think they have given that up, because it is too ambitious to get, and I don't know if they still think it is desirable or not, but -- and I don't know how to answer the question the way you put it.

Q Well, let us just focus on a couple of your words. You said it was too ambitious. What led the company to decide that it was too ambitious a task to get licenses for all the instructors that would be training the control room operators?

A The workload on the training group was so heavy that for them to take time out, several months, to get licenses, was just too ambitious. They didn't have enough people to do it, at least that's my understanding.

Q So it is fair to say, based upon your knowledge, that at least some of the instructors who are involved in the training of operators to obtain licenses do not, themselves, have licenses?

A I think that's right, yes. In my mind, there is

a great question whether they really need licenses or whether it would help them to make them better teachers.

Q What raises that question in your mind?

A Well, that's based on my general experience of teaching operators. The art of teaching is a specialty that being an operator doesn't automatically give you -- inform you how to teach somebody else as a trainer. Listening to the problems we had, I was convinced we needed to focus on people that have that knowledge and that capability to train and to teach rather than people who are operators.

Q Somebody who might be a good teacher or trainer --

A Wouldn't necessarily be a good operator.

Q Are you familiar with what goes into the training program?

A Not in detail, no.

Q Let me put in front of you two exhibits that we had previously marked, and that's Exhibits 6 and 7.

Before we do that, does the Quality Assurance Department at TMI play any part in training?

A I don't know specifically, but in general, from what I know, the purpose of quality assurance, I would say, yes, that they also run a quality assurance of the

efforts of the training program, too.

Q So the Quality Assurance monitors the training program?

A I would say yes. I don't know in what detail. I don't know that for a fact, but I would assume they do.

Q So that's just an assumption on your part?

A Yes.

Q You don't have any specific knowledge of it?

A No.

Q Looking at Exhibit 6, as you remember, as we were talking on Thursday, the second day of that meeting, Meeting No. 28, the October 13th portion of the minutes, a, referred to cross-licensing and said that the GORB recommends that Met Ed continue to investigate the following areas:

"a. Cross-licensing - how cross licensed operators will be used and how their proficiency will be maintained."

Do you see that, sir?

A Yes.

Q And we discussed the fact that you assumed an ongoing project?

A You mean the cross-licensing was an ongoing project?

Q Well, what did you take this to mean when you heard that at the meeting, let us go back and start with that.

A Well, as I recall, it was -- there was a question about maintaining operators with two licenses, and how effective you could use an operator on two different plants, and this was an area in which this was discussed, as I recall. There are specifics that are different between the two plants, and some of us have some concern about an operator who becomes proficient on one, and still is licensed on two, and then you transfer him to operate on two, that he is going to be able to sort out the specifics.

Q And so when this was raised at the October 13, 1977 meeting, is it fair to say that you had some concerns about the use of cross-licensed operators on both TMI 1 and TMI 2?

A Yes, and I wasn't alone. I think this was discussed by the group, and this is what this statement represented.

Q How many of the other members of the GORB shared that concern?

A I don't know.

Q Was it more than a majority?

A There were sufficient to produce this statement. I don't know as they even took a vote. They got comments and decided that they needed to look further into it, and the GORB itself wanted to know more.

(Continued on Page 145.)

4.1 ew

Q Let me ask you to look at Exhibit 7. Now, this was the meeting that you were not at, Meeting No. 29, but I believe you testified that you would have received a copy of this?

A That's right.

Q Afterwards?

A Yes.

Q And if there were any of the things in it that concerned you you would have raised questions about it, is that right?

A That's right.

Q Look at Page 3, where it says "Cross-licensing proficiency."

A Yes.

Q Would you read that paragraph, sir, to yourself?

A Yes.

Q Do you see the last sentence there, sir?

A Yes.

Q "It is Med Ed's intent to rotate these cross-licensed people on both units as needed."

A That's right.

Q Did you raise any questions about that when you received those minutes?

4.2

A I don't recall now whether I did or not, but this has been a subject of discussion. It is not a subject that's finished or settled.

Q Does this paragraph document the results of Met Ed's investigation in the area of how cross-licensed operators will be used?

A At that time they were reporting, that's the way they expected to use them.

Q I see. And did the members of the GORB raise any objection to that?

A At the meeting, I don't know whether they did or not, because I wasn't there.

Q Did they raise any objection to that at any meeting that you did attend after the February 22, 1978?

A There were a number of questions raised about it, and as I say, it's not a fixed decision, that even the statement reading the way it is doesn't convince me that it was that fixed, but TMI is always in the state of development, there is always new people being trained and new equipment being brought in, and it is an ever-changing scene, and they make decisions to move and later they will reconsider it. In fact, every decision they make is always up for review and

4.3

reconsideration.

Q Was this a decision based on what you see here on cross-licensing proficiency, a decision that was up for review and reconsideration?

A This doesn't read like it, but I am sure it was, because I have heard it discussed many times. There are many problems that were being developed along the way to maintain requalification exams, and they were having difficulty having them all worked in, and they had lots of reasons to be questioning their procedures all the time, because of the problems of training new people and requalifying people, and it is an ever-changing parade. It is one of the problems with a nuclear plant with two units, is that it never levels out for a long period of time, because you are always adding and training, and transferring and developing people.

Q But the concerns relating to the cross-licensing of operators, and how an operator licensed on both plants would act or react being switched from one plant to another, had that decision been reviewed and reconsidered by the GORB at any time after February 22, 1978?

A I don't recall. This doesn't say that at what

4.4

level people they are planning to cross-license. This probably -- they are referring to shift supervisors and possibly some shift foremen. They are not hands-on operators, and it is to cross-license a hands-on operator like a control room operator is a different position than cross-licensing a supervisor.

Q But they are people giving instructions and supervision to hands-on operators, are they not?

A That's right.

Q And they are people who could become just as confused as the hands-on operator being switched from one unit to another?

A Yes, they their responsibilities are not quick response, like turning knobs and things and mixing them up, because they are on one unit or another. They are standing back, reviewing the system, and they talk to the operators, and he does the action and not the foreman.

Q So --

A So it is not the same when a foreman or a supervisor is cross-licensed as it is when a control room operator is cross-licensed.

Q So it is fair to say that because a supervisor would have more time, the problem isn't as great?

A That's right. He is not that apt to make a mistake, because he forgets where he is.

Q Did Met Ed or GPU ever do a study of the impact of moving either supervisor or operating room personnel between plants?

A I don't know that they did specifically in the framework in which you state that.

Q How about generally?

A Generally, it was discussed. I have heard it discussed a number of times philosophically what problems might exist, and that sort of thing, was up for constant discussion or frequent discussion.

Q And the result of that was that it was just discussed, there was no change in policy?

A I don't know what the view is right now. There is a review going on on the whole training effort. In fact, there is always discussion and review of our training efforts. No one has ever really been satisfied with it, and I don't think -- I think other utilities find the same problem.

Q But prior to March 28, 1979, had it just been discussed without any change in policy?

A Well, I think you have to recognize that 2 had just been started in '78, and testing had started in '77,

and they never had a real good opportunity to test out cross-licensing, because everybody was just developing on Unit 2.

I feel that the supervisor must have been cross-licensed. How many of the foremen were cross-licensed, I don't know.

Q Let us go on to what has previously been marked as Miller Exhibit 8. This document we had been discussing when we broke on Thursday.

Are you aware of what actions have been taken since April 6, 1978 to correct the problem set out in this memorandum?

A No, I am not.

Q Have any actions been taken, to your knowledge, to make sure that PCR documents that conclude there is no adverse nuclear safety impact without supporting documentation?

A I can't answer that.

Q Are you aware of --

A I am not that close to the detail.

Q Would Mr. Hurbein be able to answer that, to your knowledge?

A I would think he would be a lot closer than I am. Certainly some of the managers under him could answer

that specifically.

Q This was a concern, was it not, raised by the chairman of the GORB?

A Yes.

Q Is this a concern, the resolution of which would normally be made known to the GORB?

A I would think so. GORB might be informed in the matter of a brief report by the chairman, or he might ask somebody in Met Ed to give the report. I don't recall specifically that that was done, but I would feel pretty sure along the way somebody looked into this and made a response.

Q If that report was made to the GORB, would it appear in the GORB minutes?

A I would say yes.

Q Is there any other type of document that might appear, to your knowledge?

A Not specifically, I can't think of it.

Q Mr. Miller, did you ever seen the hand-written note that Mr. Bartman placed on the bottom of this Exhibit 8?

A I don't recall seeing this until --

Q Until Thursday?

A Until last Thursday.

Q Had Mr. Bartman ever discussed it with you?
A No.
Q Had any other member of the GORB ever discussed it with you?
A This note?
Q Yes; well, the subject matter in the note "I'm in favor of cutting back on all the 'paperwork' if we can."
A I think everybody has dreams of being able to streamline paperwork without affecting our efficiency or our capability. That's a --
Q How about the second sentence, "If the NRC is not complaining about inadequate documentation, I think the GORB should agree it is okay."
Did he ever discuss that with you?
A No.
Q Did any member of the GORB ever discuss that with you?
A Not that I ever heard.
Q Was the subject of inadequate documentation to the NRC ever discussed at a GORB meeting?
A I can't recall specifically, but I would think that documentation is something that we have discussed a number of times, because documentation is a very

difficult time-consuming, ever-consuming effort, and to do it and keep up-to-date in it is a very difficult thing.

Q Licensee Event Reports are one type of documentation, aren't they?

A Yes.

Q Those Licensee Event Reports, are they reviewed by the GORB?

A I think they are sent around for GORB to review.

Q What kinds of items are reported to the NRC in Licensee Event Reports?

A Anything that affects the safety of the plant or public.

Q So that's the criteria for a Licensee Event Report?

A Safety is, yes.

Q What about something that is determined to be an operational inconvenience, would that be in a Licensee Event Report?

A I don't think so.

Q It would have to be a possible safety concern?

A That's right. To modify that, if NRC had made some decision that affected making this other decision,

then we would have to go to the NRC even though in our view, it was not a safety concern.

Q But internally in the company, Licensee Event Reports would be filed for those items that might have some potential impact on the public health and safety?

A That's right. That's a requirements of the license.

Q Have you ever heard the term "operational inconvenience" with respect to a phenomenon known as loss of pressurizer level indication?

A No.

MR. GORINSON: Let me mark as the next Exhibit, Exhibit 9, a document dated April 26, 1978, with the heading "Three Mile Island GORB," and it is addressed to a number of people, including Mr. Miller, and it says "Reviewed by JCH, Date: 5/19."

(Above-described document was marked Miller Deposition Exhibit 9 for identification, this date.)

Q Do you have what has been marked as Miller Exhibit 9 in front of you?

A Yes, I have it here.

Q Would you read that, sir?

A "GORB should be aware of --"

Q To yourself.

A Yes.

Q Are you familiar with 10CFR21?

A Not specifically.

Q Generally, do you know what that concerns?

A I am not familiar with what it concerns by number.

Q Now, this shows that you received a copy of this item. Do you see that, sir?

A Yes.

Q Do you remember this document?

A No, I don't, not now.

Q Do you remember at any time being told that the industry, and in parentheses there it says "(GE" and either "O" or "W", etc.) had united resistence to accept puchase orders requiring conformance to 10CFR21."

A What is the question.

Q Had you been aware of that before today?

A Well, I just have read it, but I have completely forgotten it.

(Continued on following page.)

Q Do you know what that was referring to?

A I don't know now, no. I probably would recall if I knew that the --

Q If I tell you that 10CFR21 deals with the reporting of defects and non-compliance, does it refresh your recollection in any way as to the subject matter of this memorandum, Exhibit 9?

A No, it doesn't.

Q Had you ever taken part in any discussions dealing with the question of reporting of defects and non-compliance to the NRC?

A No, I don't recall that I have.

Q So you have no recollection of the subject matter contained in this memorandum?

A No.

MR. GORINSON: Let me mark as the next exhibit a memorandum dated May 18, 1978, on the letterhead of Three Mile Island GORB, which was sent to Mr. Miller, among others, and at the bottom has the initials JCH, date, 6/1/78.

(The above-described document was marked Miller Exhibit 10 for identification, this date.)

MR. GORINSON: Let me also note for the record that attached to this document is a document

entitled "Report No. 77-4 TMI GORB Quality Assurance Subcommittee, covering October 1, 1977 to December 31, 1977," and another document entitled "Report No. 78-1 TMI GORB Quality Assurance Subcomittee, covering January 1, 1978 to March 31, 1978."

Q Let me put that in front of you, Mr. Miller.

Let me turn to the report headed 77-4, which is attached to Exhibit 10, and the first page of that, Paragraph 2 of that first page of Report 77-4 says:

"In our review of the Audit Reports we noted that Audit Report 77-35 entitled Operational Quality Assurance Effectiveness Review was a --"

A I don't have the page you are referring to.

Q Here (indicating).

A Yes.

Q "In our view." Have you got that in front of you?

A Yes.

Q "...was a lengthy review of the QA program. This audit was performed by three Met Ed personnel who are not connected with the QA operation."

Are you familiar with the reasons why three

Met Ed personnel who were not connected with the QA operation were selected to do this audit?

A I am not specifically familiar, but I can think of many reasons why I would do the same thing.

Q Okay

A Tney wanted to get somebody who was not too familiar with the process, hopefully, to be more objective.

Q You said you are not specifically familiar?

A No, I am not.

Q With this?

A No, I am not.

Q You received a copy of this, did you not?

A Yes. They made these periodically.

Q And when you receive a copy of this, do you read them?

A I try to.

Q Do you ever go back and ask questions about these quality assurance subcommittee reports?

A I have, yes. I don't recall particularly what the subject was, but I have asked questions about it.

Q On what types of items would you ask questions?

A Anything that I didn't understand or I felt that I had a question about. I don't know as I could put

them in any category.

Q Let us see if there is anything in here that you would have asked questions about.

The next sentence of Paragraph 2 says, "This audit produced the following conclusions which are of interest:" Let us pass over A, and then turn to B: "Trend analysis has shown the effectiveness of the OQA program to have decreased over the past year, and is continuing to do so."

What is OQA?

A Operating QA.

Q And what does Operating QA deal with?

A Operations.

Q Operations of the plant?

A Yes.

Q And what specific types of things do they look at in Operating QA?

A Basically all of the operations of -- their procedures, and their training, anything to do with operations is reviewed by Operations QA. That's the purpose of it.

Q Well, some operating QA would look at training of personnel, and would look at operating procedures. Would it look at maintenance?

A I am sure if that affected operation, they would

look at it.

Q Would you find it significant when you received the report that contained the statement "Trend analysis has shown the effectiveness of the operating quality assurance program to have decreased over the past year, and is continuing to do so"?

A My reaction to that would be to find out what the plant operating force reaction to it was, and what they proposed to do or answer. Maybe they might disagree with them and give good reasons why.

Q Did you, in fact, do that?

A I don't recall that I did.

Q If you did that, what form would your request or follow-up on that take, would it be written or oral?

A It would be oral in the GORB meeting, probably. However, we have the sheets like this, and these are all sent to the GORB members with these sheets, and if we want to make a comment on anything that's carried by one of these sheets, we just write it on here, and send it back to the secretary.

Q Would you retain a copy of any comments you make?

A No, I wouldn't.

Q You wouldn't?

A No.

Q You just send the comments on?

A And I don't know whether the secretary does. He makes a summary of them, and then he reports back to, he either acts on it, if he can, or reports back to GORB on it, and I think he throws them away to keep from getting drowned in paper.

Q But you have no recollection of how he acted on this particular paragraph?

A No, I don't.

Q Let us turn to the second page of Report 77-4, which is an attachment to Exhibit 10.

The last paragraph there says: "Comment B is of concern to the Subcommittee since it states that the program effectiveness is decreasing. The auditors did point out, however, that they had no previous experience as auditors and that this function might better be performed by QA auditors from JCP&L."

Do you see that?

A Yes.

Q Again, coming back to the question of auditors being selected who had no previous experience as auditors, do you have any knowledge as to the reason

why those individuals were selected?

A Not specifically, but I gather from reading this, that their alternative, they suggest, is to pick an experienced auditor from Jersey who is not too familiar with details to get somebody with a new point of view or objective point of view. That's what they are recommending here is the way I am reading it.

Q Yes, but what I am asking is, the underlying reason why auditors who had no previous QA experience were selected.

A I don't --

Q Auditing experience.

A I answered that before, that I don't know specifically that I -- I do have some thoughts of my own of why it was done or why I would do it.

MR. GORINSON: We request of counsel that we be provided with audit reports 37-35, please.

MR. YUSPEH: Of course.

Q So it is fair to say then that you have no specific or general recollection of this particular matter?

A That's right.

MR. GORINSON: Let us mark as the next exhibit, a document entitled "Three Mile Island

Nuclear Generating Station, General Office Review Board, Final Minutes - Meeting No. 30, June 6, 1978."

(The above-described document was marked Miller Exhibit 11 for identification, this date.)

Q Do you have a copy of that in front of you?

A Yes.

Q Now, looking at the heading, this document is marked "Final Minutes"?

A Yes.

Q Do you see that?

A Yes.

Q Were there draft minutes of this meeting?

A There are draft minutes of all meetings.

Q Let me refer you again to Exhibit No. 6, which just uses the word "Minutes." Do you see that?

A Yes.

Q Were there draft minutes of those minutes as well, which are part of Exhibit 6?

A I assume that there were, because that's procedure, that they always prepare shortly after each meeting a set of draft minutes and send it out to the members with one of those sheets, and ask everybody to read them and make a note on the sheet and send them back for any

comments that he has or questions. And then the secretary takes these sheets and the first thing we do at the next meeting we review these notes and discuss them, and make a decision relative to the questions raised.

Q And the same would be true with respect to No. 7, which has the word "Minutes" on it, but doesn't say "Final" or "Draft"?

A That's right. It is my recollection the final minutes just say "Minutes" and the draft minutes have written on it "Draft."

Q And the GORB secretary would be the repository of draft minutes of the GORB?

A He would, if they are kept, yes. I don't know whether he keeps them after we review them and decide on final minutes.

MR. GORINSON: Counsel, I would like to request the draft minutes of the GORB for the time period covered by the subpoena.

MR. YUSPEH: What period of time is that?

MR. GORINSON: 1966 to the date of service.

Q Let us look at Exhibit 11. The first paragraph on the first page notes that Mr. T. M. Schuler -- who is he?

A I can't be sure, but I think he is a B&W man, and he and Mr. Kulynych, whatever his name is, he is taking over as a permanent member, and the other man is his alternate.

Q Do you know what Mr. Schuler does at B&W?

A No, I don't. They change their people a number of times.

Q But it is fair to say that B&W is the only outside GPU family company represented on the GORB, isn't that correct?

A No.

Q Who else is represented on the GORB?

A W. W. Lowe.

Q Who is W. W. Lowe?

A He is a member of a firm of Pickett & Lowe.

Q And Pickett & Lowe are consultants to GPU?

A Yes.

Q In what area?

A Nuclear.

Q Any other outside GPU personnel on the GORB?

A No, not on that list.

Q Is Burns & Roe represented on the GORB?

A No.

Q Do you know what reasons led GPU to invite B&W to serve on the GORB?

A Because they have a continuing technical support role under agreement to assist in nuclear areas, particularly, and in answering questions, many of them, we have to get B&W's assistance, and it helps to have a representation on GORB.

MR. GORINSON: Let us take a break for a few minutes.

(There was a brief recess.)

(Continued on Page 167.)

6.1 ew

Q We were discussing Exhibit 11. Looking at Page 2 of that Exhibit, Item 1D-PORC minutes. At this time, did the GORB review each set of PORC minutes?

A No. They set up a procedure that was supposed to have a review given to GORB, and I don't remember exactly how it was supposed to work, but I know in my particular case, unless there was some particular reason for reading a set of PORC minutes, I never went through all of the minutes. They come in by the hundreds, or dozens; maybe that's an exaggeration, but they're thick packs.

Q Those PORC minutes have attached to them the Licensee Event Reports, and other reports?

A No, I think primarily they just list by subject the number and then the action of PORC.

Q Just the action of PORC?

A As I recall.

Q Since they list only the actions of PORC, which was in summary fashion, is that correct?

A Yes.

Q Of what use was it to the GORB to review the PORC activities?

A Well, I think that question GORB asked itself, and then we set up some procedure, and I forget exactly

6.2

what it is now, where some group would make a report on PORC minutes.

MR. GORINSON: Let me mark as the next Exhibit a document entitled "Metropolitan Edison Company, Three Mile Island Nuclear Station, Unit No. 2 Operations Review Committee, Meeting No. 254, February 5, 6, 7, 8, 9 and 10, 1978."

(Above-described document was marked Miller Deposition Exhibit 12 for identification, this date.)

Q I show you what has been marked as Exhibit 12, sir, the Meeting No. 254 of the PORC, which I understand it Exhibit 12 was one of the minutes reviewed at the GORB meeting whose minutes have been marked as Exhibit No. 11.

Was this a fairly typical set of PORC minutes?

A Yes, this is the way I remember them recently.

Q And they were in very summary form, is that right?

A That's right.

Q So for instance, let us look at Page 2 of Exhibit No. 12, where it says "New Procedures. Alarm Responses."

"1. The following alarm response (2204) associated with the Control Building Area Flood Door was reviewed and recommended for Unit Superintendent approval." Do you see that, sir?

A Yes.

Q What type of review would the GORB make of that alarm response procedure?

A Unless it specifically pointed out that there was some explanation other than just glance through it, I don't think there would be any review. They also, though, set up to have specifics looked at by representatives in this procedure that they set up here.

Q But as a standing matter, it would be difficult for the GORB to review the actions of the PROC?

A That's right.

Q Based on these minutes, would it not?

A That's right.

Q Was that matter raised with the PORC?

A We discussed the difficulty of reviewing PORC minutes, and that's what led to this decision here as a way to deal with them.

Q So the decisions listed on Page 2 of Exhibit 11 arose out of the difficulty the GORB had

6.4 in reviewing the PORC minutes?

A That's right. This has been a subject of discussion for a long time, because they just come in thick packs, and there is no way that you could review them.

Q So since that decision was made, has a summary of PORC activities been presented at each meeting?

A I don't know whether it is at each meeting, but at certain meetings they bring in the summary or they mail it to us.

Q So the GORB is provided with a summary of PORC activities, a written summary?

A This looks familiar. I don't know how often they come, but I have seen these, so I would say yes.

Q These are the PORC minutes, at least that's what we understand them to be?

A Yes.

Q Is this the type of document you receive in the mail as a member of the GORB?

A I have seen them. I assume that's the way I have seen it. I have seen documents that look like this, but since this decision was made, the GORB secretary reviews and distributes written summary once

6.5 a month prior to each GORB meeting, so I assume this is the thing we get.

Q Well, if that's what you are getting, then all you are getting is the PORC minutes themselves, not a summary?

A Well, these are summaries themselves. There is backup data on each of these that go into the files of the plant. We don't get any of that.

MR. GORINSON: Let's see if we can short-circuit this.

Counsel, may I request any written summaries of PORC activities that are presented to the GORB at each meeting or prior to each meeting, including the written summary that according to Paragraph 2 of Item 1D of Exhibit 11 is supposedly distributed one month prior to each GORB meeting.

Q Is it fair to say, Mr. Miller, that based on these PORC minutes, it was difficult for the GORB to review in any detail the actions of the PORC?

A Yes. That's the problem we have been trying to answer for some time.

Q Was that concern noted or made known to the PORC?

6.6

A Yes, because we used to get -- we tried to get a review of PORC minutes, and this has got to be -- well, it is just so many of them, it can't be done, and that's why this summary effort was developed to just try to give us some idea of what GORB did.

Of course, we don't review them in detail, because that would be doing their work, and they are responsible for the superintendent, and they answer to the superintendent concerning the safety of each item, and he acts; GORB doesn't act. It is only after the fact as far as we are concerned.

Q Has the GORB instituted a spot check of PORC meetings?

A I would say they did here.

Q Well --

A I don't recall that particular reporting, but it must have been done.

Q Have you ever been assigned to conduct a spot check of PORC meetings?

A No.

Q To your knowledge, has any member of the GORB been assigned to conduct a spot check?

A Not specifically.

Q How about generally?

A Generally, I would say it has, if they decided to do it. Thorpe is a good chairman, so I would certainly expect that something had been done.

Q Well, have you received any reports from GORB members at any of the PORC meetings you have attended, detailing a GORB member's review of a spot check of PORC meetings?

A I don't recall that specifically.

Q Do you recall it at all?

A I recall discussion about this problem. I recall discussion at different times about things that PORC did, but not anything specific at this time.

Q Let us go further down Page 2 to the second to last paragraph, where it says, "The GORB had several additional comments on the PORC minutes. There was concern about the manner in which temporary change notices are incorporated into station procedures."

Do you see that?

A Yes.

Q What was that about, sir?

A I don't remember.

Q Do you keep notes of GORB meetings?

A I do, if it is something that I particularly feel I could do something about or have a particular concern.

Otherwise, I depend upon the secretary.

Q Do you retain your notes?

A No, not after I do what I want to do with it.

Q About how long does it take you to do what you want to do with them?

A It varies, it depends on what it is.

Q How about if there was a concern about the manner in which temporary change notices are incorporated into station procedures, would that be a concern of yours?

A Well, it could be, and if I had a concern, I would either make a telephone call or I would see somebody who is knowledgeable in that area and get the answer, and satisfy myself relative to that, and I would throw my paper away.

Q But you don't keep your own set of notes or minutes or memoranda of GORB meetings?

A No. I am not a minute taker.

Q Let us look at Page 3, the top sentence, "How many times have operator errors occurred because of ambiguous procedure? One or two LER's were written as a result of ambiguous procedure on TMI 2."

Do you see that?

A Yes.

Q Did that raise a concern in you when you saw this?

A Yes, that raised a concern to everybody.

Q Well, how often have ambiguous procedures been identified at TMI 2?

A I don't recall.

Q Was the question answered, how many times have operator errors occurred because of ambiguous procedure?

A I don't know the answer to that, either.

Q Would you have made a note to yourself about this particular subject when it was raised?

A Probably not.

Q Would you take any action yourself when this subject was raised of operator errors based on ambiguous procedure?

A Probably only verbal action. If it was in an area that I felt concern about sufficient to do something, then I would ask questions.

Q Is this an area where you would have sufficient concern to ask questions?

A I don't think I did, no.

Q Do you remember this discussion at the GORB meeting of June 6, 1978?

A I remember several discussions about this problem of writing procedures that are clear and non-conflicting, and understandable. I remember that discussion several times.

Q The question of --

A It is a very difficult thing to do, and so everybody has a concern about that in writing constructions.

Q Are you familiar with how the operating procedures at TMI 2 were written?

A Not specifically, no.

Q Do you have any general information on that?

A No, I was not that close to that effort.

Q Did you ever hear any information about how those operating procedures were written?

A I know when they were first written. I could never get enough people in there to do the job, and it is always a very difficult area to get the work done, and you need technical people to do it, and that part I remembered lots of discussion on, but I don't remember anything specific.

Q Do you know how the company resolved that question, given the fact that it was hard to get technical people in?

A We tried to hire more people, experienced people.

Q Let us look down Page 3 to Item 1F, Licensee Event Reports. Do you see that paragraph, sir?
A Yes.
Q It says "There was a general GORB comment regarding the number of LER's generated since TMI 2 received its Operating License," and then it says "The plant staff noted that the initial LER's were issued using a strict interpretation of the STS." Is that the Standard Technical Specification?
A Yes.
Q And is the strict interpretation referred to the NRC's strict interpretation, or the company's
A I think it is the company's interpretation of the NRC's standard technical specs.
Q And the next sentence says that "Met Ed and the NRC have negotiated a more lenient position on the interpretation of STS requirements." Do you see that?
A Yes.
Q Was that position reported to the GORB?
A It is reported here, and that's all that I suppose it would be reported. If it is a matter of information for GORB, what efforts they were making, and the success they were having, they wouldn't go into detail.

Q What about the substantive content of that negotiation?

A Not unless there was some specific safety-related item would it come up for detail.

Q To your knowledge, was that negotiation or the result of that negotiation put in writing?

A I don't know.

MR. GORINSON: Counsel, I would like to request a copy of all documents relating to the negotiations between the NRC and Met Ed on a more lenient position on the interpretation of the STS requirements, including whatever the result of that negotiation was.

MR. YUSPEH: What item number is this?

MR. GORINSON: That's 1F of Exhibit 11.

(Continued on following page.)

Q It is also stated in that sentence "That the number of LER's generally double when STS are used."

A Yes.

Q Do you see that?

A Yes.

Q Do you remember who provided the GORB with that information?

A No, I don't.

Q But it would have been somebody in attendance at the meeting?

A I would say yes. It refers to so-called GRR numbers, which come through on these forms.

Q I see. So these Licensee Event Report statements would refer to GRR 265 and GRR 273?

A I would say yes, they came about because of the GORB was given those documents, and so there must have been questions asked, and these were some of the answers that were given.

MR. GORINSON: Counselor, if we haven't already been supplied with it, I would like copies of GRR 265 and 273.

Q Now, the TMI 2 experience is comparable to other nuclear plants using STS. Are you familiar with which other nuclear plants use the Standard Technical

Specifications?

A No, I am not. The ones that have come onstream about the time that 2 did, I am sure use the Standard Technical Specs.

Q Do you know if Davis-Besse 1 uses the standard specifications?

A No, I don't.

Q Looking down the page where it says "Operations," it refers to a presentation on an April 23, 1978 reactor trip and ES incident. Is that emergency safeguards or engineered safeguards incident?

A I am not sure.

Q It says there that "The event caused both violations and STS action statement entries."

What is an STS action statement entry?

A I don't know specifically. The tech specs require certain action statements, and that's what that refers to.

Q These minutes would be prepared by Mr. Reppert in his capacity as secretary?

A That's right.

Q When it says "The event caused both violations," is that violation of the tech specs?

A Where is that, I don't see it.

Q The same sentence, "The event caused both violations and STS action statement entries."

A I would say yes. They are referring to the tech specs when they have a violation, and when they do, then they have to make certain statements.

Q Then look at the next sentence where it says "Operator action was prompt and correct except that they were not aware of the fact that they were dealing with a major steam leak and therefore feedwater should have been secured."

A Yes.

Q If the operators weren't aware that they were dealing with a major steam leak, how could their action have been prompt and correct?

A I don't know enough about the incident to comment.

Q You were provided, though, according to this paragraph, with a copy of the report of April 23, 1978 reactor trip?

A Well, that's probably true.

Q But all you would be doing is reviewing it after the event?

A That's right.

Q And what would be the GORB's function in reviewing it after the event?

A If any member of GORB thought it had any safety-related concern, then it gets more action.

Q And that more action would be what?

A Well, that depends on what the incident is, and what it takes.

Q How about an incident where --

A They would want to be assured what action was taken, and what correction was taken so it wouldn't happen again if it was that kind of an incident.

Q It says, among other things, that "The operators will be given additional training which will include review of this transient and all other trips."

Do you see that?

A Yes.

Q Who would have responsibility for implementing that decision of the GORB?

A Well, the unit superintendent sits on these meetings as well as the station superintendent, and they're the ones whose responsibility it is to get this information down the line and get action taken.

Q On June 6, 1978, the unit superintendent would have been Gary Miller, would it not?

A On June --

Q June 6, 1978.

A I suppose so. He was acting in double capacity there for a while.

Q And do you remember what the reasoning was that the operators will be given additional training which will include review of this transient and all other trips?

A I don't remember the specifics, no.

Q Now, in the last paragraph there it says "GPUSC has formed a task force to perform an independent review."

A Yes.

Q Does GPUSC form task forces to deal with every transient that takes place?

A I don't know. I am sure if there is any problems in the way it was carried out or any unknown factors, that they would.

Q And therefore, would it be fair to conclude that the GPUSC considered the 4/23/78 event to be fairly significant?

A Yes. It doesn't say -- it says GPU, it doesn't say GORB, so that somebody in the Service Company reviewed this and sat up this, I guess, rather than GORB.

Q And it says also, does it not, that the GORB would take no further action except to compare the

TMI report to the GPUC report at this time?

A That's right.

Q And the results of this comparison would be presented at the next GORB meeting?

A Yes.

MR. GORINSON: Counsel, I would like to request a copy of the next GORB meeting, No. 31, because it has not been supplied to us.

MR. YUSPEH: Do you know the date?

MR. GORINSON: No, I don't. All I know is No. 31.

A 30 or 31?

Q This is No. 30, and according to the last page of this, the next meeting was scheduled for September 26th and 27th, 1978.

MR. YUSPEH: I am sorry?

MR. GORINSON: The last page of Exhibit No. 11 shows that the next GORB meeting was scheduled for September 26th and 27th, 1978.

Q Now, let us look at the next page, still under the same item "Operations," and it says that "The GORB is concerned about design problem information getting to the Forked River project. The Committee was told about a mechanism for passing on information but it

is not being used extensively." Do you see that?

A No, I don't.

Q At the top of Page 4.

A Yes.

Q Was anyone in the meeting able to explain why design problem information was not being forwarded to the Forked River project or was not being used extensively?

A No, I don't recall. I remember the discussion about passing information on, and I don't recall the specifics that were taken relative to this statement.

Q It was suggested, it doesn't say by whom, but that a letter be sent to the Forked River group recommending that the TMI 2 design problems and other generic PWR problems be considered in the Forked River design.

Do you see that?

A Yes.

Q Was that letter sent?

A I don't know specifically.

Q Was it ever reported back to the GORB whether that letter was, in fact, sent?

A Not to my knowledge.

MR. GORINSON: Counsel, I would like to

request a copy of any letter sent to the Forked River group talking about TMI 2 design problems and other generic TWR problems.

MR. YUSPEH: Off the record.

(Discussion held off the record.)

Q Now, looking at the next paragraph, it says "The GORB also recommended that Met Ed be asked about their procedures to review incidents at other nuclear stations."

Do you see that?

A Yes.

Q That's labeled "Action Item No. 31." What is an action item?

A The chairman will specify action item, and then he gives them to certain people and wants an action taken and a report made back.

Q Is that set out in writing some place, who has been given the assignment on a particular action item?

A I don't know. I think in many cases it is, but many times it may be just a telephone call from the chairman.

Q If it was in writing, would it be maintained by the GORB secretary?

A If it came from the GORB, it would be.

Q Is this statement that is here on the page, what would be referred to as Action Item No. 31, or is that a separate document?

A That's a separate document. It spells out more specifically what is wanted and who is to do it.

MR. GORINSON: Counsel, I would like GORB Action Items Nos. 30 and 31.

Q Do you know what caused GORB to ask Met Ed about their procedures to review incidents at other nuclear stations?

A Well, we know that Met Ed keeps close touch with the other nuclear plants, particularly B&W plants. They also, through EEI committees hear reports on all the plants of incidents and what GORB was encouraging him to do was to follow up on this information so that they could learn what effect it has on their own efforts.

Q Was it GORB's feeling that Met Ed was not following up on what they were hearing?

A I don't think so. I think it is just a matter of emphasis, because they give reports to GORB verbally on the things they learn about other plants and how they relate to Three Mile Island.

Q So, for example, would the GORB have been

presented with a report about the incident at Davis-Besse 1 plant on December 24, 1977 by the Met Ed management?

A I don't recall. If they did, I wasn't there. I don't remember it, although I know specifically that the Met Ed and GPU people knew about it.

Q They knew about it?

A Yes.

Q How do you know they knew about it?

A They told me.

Q When did they tell you that?

A I am repeating myself from last Thursday, but Mr. Arnold told me and Jeff Fritzen told me. He is an engineer in the Generation Division of Met Ed.

Q And they knew about it at or about the time it took place?

A Yes.

Q Do you know whether they made any recommendations as to procedures to take account of the Davis-Besse 1 transient?

A Not that I know of specifically. There was a major difference, I understand, between that incident, because that unit was just starting up, and it only happened at a very low load.

Q I see. And except for the fact that that unit was operating at 9 percent power and TMI 2 was operating at 97 percent power, when the accident occurred on March 28, 1979, were there any other major differences between the two incidents, to your knowledge?

A Not to my knowledge, but that's a major difference.

Q Did Mr. Arnold or Mr. Fritzen ever ask the Training Department to examine the Davis-Besse 1 September 24, 1977 incident, if you know?

A I don't know specifically.

(Continued on Page 190.)

8.1 ew

Q Has that subject come up since March 28, 1979 in the GORB?

A No, not to my knowledge.

Q Has anybody raised that subject with you?

A I think Mr. Arnold is the one that told me about it, and then I asked him, and he said Fritzen knew more about it, and then I asked Fred Fritzen, and Fritzen himself had it investigated, and others also. It had been a subject of considerable discussion within the GPU engineering organization and the Met Ed.

Q That was at the time of the incident?

A Following the incident.

Q Had they had any discussions with Babcock & Wilcox?

A Oh, yes. It came up in the so-called owner's group. These are people who have B&W reactors.

Q Do you know if Met Ed keeps minutes of the owner's group meetings?

A There are written documents that come through. I don't know whether B&W puts them together or how. I have seen one or two. I don't know who puts them together, whether it is a trip report by the engineer or whether it comes from B&W. I didn't examine it that close.

8.2 MR. GORINSON: Counsel, let me request all documents from the owner's group, if they exist, that are in the GPU family's possession from September 1, '77 forward.

Q Let us go on.

Item 3A deals with small break LOCA. Do you see that?

A Yes.

Q And that as a result of certain class of small break LOCA there was to be a new operator action. Do you see that in the second paragraph?

A Yes.

Q And that was "to use operator action during the early stages of the accident to effectively mitigate the accident consequences."

A Yes.

Q And that was to consist of, was it not, a control room LOCA operator?

A Yes.

Q Who is trained to recognize the systems and respond to a small break LOCA?

A Yes.

Q Can you tell me what kind of training someone goes through to become a small break LOCA operator?

8.3

A No, I don't know specifically. I have heard them talk about these special training efforts relative to these type of incidents, but I never went into detail with them.

Q And it says also in that paragraph, "A proposed hardware fix will be submitted to the NRC by mid-summer 1978." Do you see that?

A Yes.

Q What is a hardware fix?

A It means some piece of equipment either would be changed or added.

Q And according to that paragraph, the fix will eliminate the need for operator action?

A Yes.

Q It is correct to characterize the creation of a control room LOCA operator as a procedural fix?

A I don't know enough about this thing specifically to answer that.

Q But this was presented to the GORB, was it not?

A Yes.

Q And for what purpose was it presented to the GORB?

A Their information as to what they were doing

8.4

about these kinds of problems. Without specifically telling them all the details of what they were doing, they wanted them to know that they were doing them.

Q But a small break LOCA could potentially affect the public health and safety, could it not?

A I would say it could, yes, but not apt to or likely, but it depends on how it is treated.

Q The incident on March 28, 1979 was, in effect, a small break LOCA, was it not?

A I would say yes.

Q So in certain circumstances, a small break LOCA could at least potentially affect the public health and safety, isn't that correct?

A Yes.

Q And for that reason that procedure would be presented to the GORB for its review?

A Not in detail. GORB doesn't usually review procedures in detail.

Q But what is the purpose then of presenting this to the GORB?

A To inform the GORB that they were doing this training.

Q And what action was the GORB supposed to take upon receiving this review that was not in detail?