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PRESIDENT'S COMMISSION ON THE :
ACCIDENT AT THREE MILE ISLAND :

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DEPOSITION of METROPOLITAN EDISON COMPANY
by JEFFREY FREDERICK FRITZEN, held at the offices of
Three Mile Island, Harrisburg, Pennsylvania, on the
19th day of July 1979, commencing at 9:30 a.m., before
Stephen McCrystal, Notary Public of the State of New
York.

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

3 FOR METROPOLITAN EDISON

4 SLAW, PITTMAN, POTTS & TROWBRIDGE, ESQS.
5 Attorneys for Metropolitan Edison
6 1800 M Street, N.W.
7 Washington, D.C.

8 BY: ALAN R. YUSPEH, ESQ.
9 of Counsel

8

9

10 PRESIDENT'S COMMISSION ON THREE MILE ISLAND:

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11 JOAN GOLDFRANK, ESQ.
12 Associate Counsel

12

13

14 ALSO PRESENT:

14

15 CLAUDIA A. VALLETRI

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18 J E F F R E Y F R E D E R I C K F R I T Z E N ,

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19 having been duly sworn, was examined and testified

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20 as follows:

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21 DIRECT EXAMINATION

21

22 BY MS. GOLDFRANK:

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23 Q Could you state your full name and spell

23

24 it for the record, please.

24

25 A Jeffrey Frederick Fritzen, J-e-f-f-r-e-y

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Fritzen

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2 F-r-e-d-e-r-i-c-k F-r-i-t-z-e-n.

3 Q State your current address, please.

4 A 2108 Gring Drive, Wyomissing, Pennsylvania.

5 Q Your current employer?

6 A Metropolitan Edison Company.

7 Q And your current position there?

8 A I am senior engineer in the Mechanical and

9 Systems Engineering Section.

10 Q Have you brought a resume with you today?

11 A Yes, I have.

12 Q Is this it?

13 A Yes.

14 MS. GOLDFRANK: I would like to mark this
15 as Fritzen Deposition Exhibit 1, please.

16 (Above-described document was marked Fritzen
17 Deposition Exhibit 1 for identification, this
18 date.)

19 Q Did you prepare this resume?

20 A Pardon?

21 Q Did you prepare this resume?

22 A Yes, I did.

23 Q I would like to state for the record that
24 if you can't hear a question that I ask, or don't
25 understand, just ask me to repeat it.

1
2 A All right.

3 Q Your resume states that you graduated in
4 1965 from Pennsylvania State University with a Bachelor
5 of Science and Chemical Engineering; is that correct?

6 A That is correct.

7 Q And in 1967, you graduated from Penn State
8 University with a Master's Degree in Nuclear Engineering?

9 A That is correct.

10 Q Your resume also indicates that in July
11 of 1968, you received a Certificate of Completion from
12 from Bettis Reactor Engineering--

13 A School.

14 Q Is that a school?

15 A It is a school run by the Navy.

16 Q Could you explain what your training was?

17 A At Bettis?

18 Q At Bettis.

19 A If I may, it was similar to a master's, another
20 master's degree course, in which those subjects (Indi-
21 cating) were taught.

22 Q What years were you in the Navy?

23 A 1967 to 1971 as an officer in the United States
24 Navy. From 1971 to 1972, employed for the Department
25 of the Navy.

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2 Q Could you explain what this training was
3 for while you were in the Navy?

4 A This was a school that Admiral Rickover sent
5 engineers on his staff to for a six-month comprehensive
6 course in reactor designing. The course covered core
7 design, stress analysis, reactor physics, instrumenta-
8 tion and control, heat transfer for -- in general,
9 and I guess preparation for work I did for him on
10 staff.

11 Q Were you on General Rickover's staff?

12 A I was on the Admiral's staff, yes.

13 Q Could you explain what your responsibilities
14 were on his staff?

15 A My responsibilities on his staff were -- well,
16 for the first nine months I was in the Materiel
17 Department, at which time I coordinated radiation
18 testing, reviewed the proposed testing programs to
19 ensure they tested the required exposure, did some
20 equipment design with regard to radiation test equipment.

21 Then I went to the Bettis School for six months,
22 and when I came back, I was assigned to the Refueling
23 Section, where I was responsible for overseeing the
24 Surface Ship AlW type refueling. I was initially
25 assigned as engineer working for a supervisor and

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2 responsible for the ENTERPRISE refueling, the overall
3 supervis'ion, approval of procedures, review and approval
4 of equipment design.

5 After that, I did design for the new Surface
6 Ship Refueling, did oversee the design of equipment
7 for that refueling, at which time I was promoted and
8 took over as head of Surface Ship Refueling, and was
9 in charge of all A1W refueling, including equipment.
10 development.

11 Q Was the course at the Bettis Reactor School
12 a theoretical course?

13 A Combination, both.

14 Q Could you explain, please.

15 A A lot of it was theory, but one of the projects
16 that was involved was application of the theory in the
17 design of a reactor core, so we applied what we had
18 into a fictitious design of a real reactor core.

19 Q How were you chosen to serve on Admiral
20 Rickover's staff?

21 A I was in the Navy and applied, told them I was
22 interested in serving in the nuclear power program,
23 to either go to sea on a submarine, or hopefully, to
24 work on staff. We went down for an interview, and he--
25 his people interviewed, asked if I would be interested

1
2 in the staff.

3 I am not sure how they arrived at who they picked,
4 but I said yes and went for a series of three inter-
5 views, an interview with the Admiral, and they asked
6 me if I would be interested in working there rather
7 than going to sea, and I said I would.

8 Q How many people were involved in this
9 Bettis Reactor Engineering School?

10 A I don't know the exact number. There were about
11 20 in our class, and there was a class every six months.
12 The total number of people that went through, I think
13 everybody on staff eventually went through this course.

14 Q Were there written exams given?

15 A Yes.

16 Q Is that the basis for the grade?

17 A Yes.

18 Q You went from your service in the Navy to
19 your employment at Metropolitan Edison; is that correct?

20 A Yes.

21 Q You began your employment with Metropolitan
22 Edison in June of 1972; is that correct?

23 A Correct.

24 Q What was your initial position at Metro-
25 politan Edison?

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A Job description -- is that what you mean?

Q What was your title?

A My title was staff engineer, nuclear.

Q And what would those responsibilities entail?

A When I first started, I had primary responsibility as test auditor for Three Mile Island Unit 1, startup and test program.

Q In 1973, you then moved to the Nuclear Engineering and Power Plant Performance Section; is that correct?

A I guess that section was created -- yes.

Q But your responsibilities would not have changed?

A Well, as the job grew, I was doing ---besides being test auditor, I was on the general Metropolitan engineering staff, and I was doing engineering work in support of Three Mile Island Unit 1, mechanical-type engineering and systems-type engineering. So responsibility stayed the same although the organization was formalized, if I may say, structured into a structure department form rather than how it had been before that. That was really the development of the Metropolitan, you know, when I came, the

1
2 Engineering Section was just developing to take over
3 the operations of Unit 1.

4 Q And you stayed in that position until 1976?

5 A Correct.

6 Q And until 1976 to the present, you have
7 been in your present position?

8 A Yes.

9 Q Could you explain your -- your resume
10 reflects that you report to Mr. Lefin.

11 A Yes.

12 Q Could you explain how, organizationally,
13 that fits into the Met Ed structure?

14 A Mr. Lefin is the section head of Mechanical
15 and Systems Engineering. He reports to Mr. Klingaman,
16 who is the manager of Engineering.

17 MR. YUSPEH: Who does Mr. Klingaman
18 report to?

19 THE WITNESS: He reports to Mr. Herbein,
20 who is the vice-president of Generation.

21 Q And you were located in Reading or in
22 Three Mile Island?

23 A Yes, in Reading.

24 Q How often would you visit the actual site
25 at Three Mile Island?

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A In my current responsibility, I get here about once or twice a month. That is not typical, though, of our engineering staff. They may be here on the average of once a week.

(Continued on Page 10.)

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2 During outages, typically, I may be two weeks to
3 a month at a time.

4 Q When you say you would get here once or
5 twice a month, is that since the accident or before the
6 accident?

7 A No, I meant before the accident.

8 Q Why is that unusual that you would come once
9 or twice a month and other engineers would come more
10 frequently?

11 A Well, I now have -- I am now supervising other
12 engineering -- other engineers, so they primarily have to do
13 the detail design work and are the people doing the inter-
14 facing or contacting. I am more or less there supervising
15 and reviewing their work. There is not a need for me
16 to come to as many meetings, on-site meetings, as there
17 had been when I was -- earlier in my career.

18 Q Would you explain what exactly your
19 responsibilities are in your present position?

20 A Right now I have four or five engineers that I am
21 responsible for reviewing their work and of assigning
22 their work, and reviewing their work, and signing off
23 as the technical reviewer, independent reviewer, the
24 function that we do in performing our design work.

25 Q What type of design work are you referring to?

3.2

2 A We are talking about the work associated with
3 plant changes that are made to Unit 1 or happen to be
4 made to Unit 2 whenever you change the design of the
5 plant, that design to support that, and safety reviews
6 required to support that, that effort there.

7 Q What contact would you have with the actual
8 operators at Three Mile Island?

9 A We don't really contact the operators. The
10 contact we would have would be with their supervisors
11 or supervisor or operations or their engineers that are
12 in the Operations Department at Three Mile Island.

13 Q And which particular individuals would that
14 be?

15 A For Unit 1 it would be Mike Ross or Henry Shipman.

16 Q And for Unit 2?

17 A Jim Floyd -- and I am not sure who the other
18 engineer would be.

19

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(Continued on following page.)

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2 Q As far as the design changes that you
3 supervise, your department would be in charge of,
4 would you initiate, make the determination that certain
5 changes should be made?

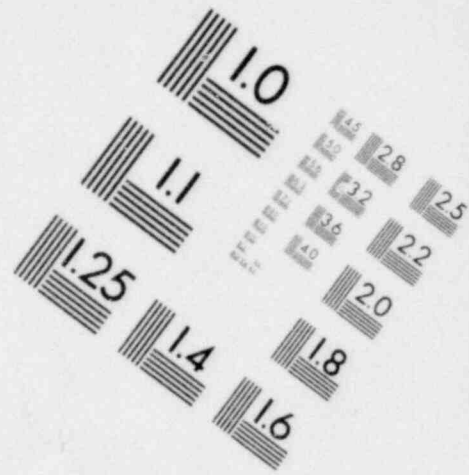
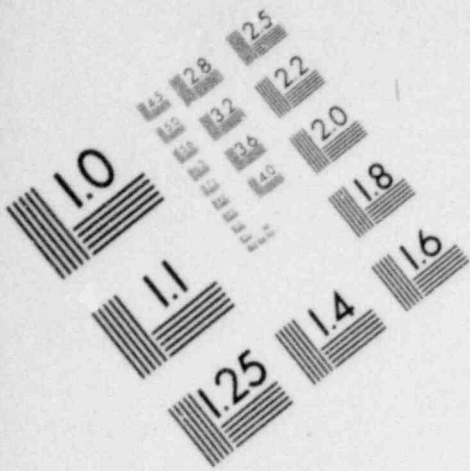
6 A Sometimes we would do that; other times we just
7 review what the plant staff has proposed to be changed.

8 Q When you would initiate it, how would you
9 get information that would be the basis of that deter-
10 mination that there should be changes?

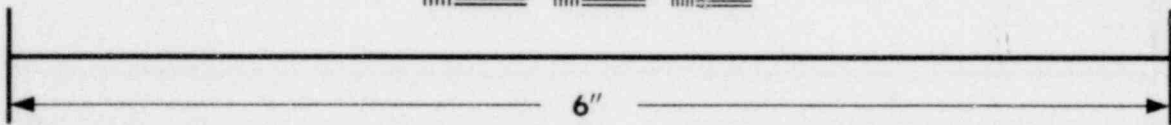
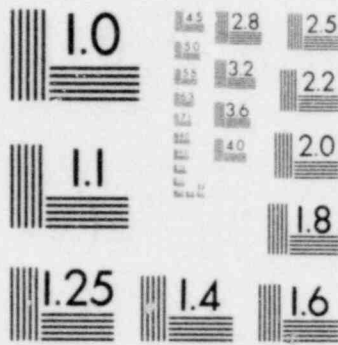
11 A Normally -- well, it would be a lot of methods
12 by which that would happen. It would be through the
13 interviewing staff at Three Mile Island identifying a
14 problem either orally or in writing to the manager of
15 engineering, to ourselves. It would be as a result
16 of a question raised by the Nuclear Regulatory
17 Commission, or it would be through any mechanism such
18 as our licensing department asking us to do a review
19 in this area where we find some deficiency.

20 Or it could actually be as a result of a problem
21 experienced at the plant, that when we got into it,
22 understood what the cause of the problem was, realized
23 there were design changes to be made, gone about doing
24 design to correct the problem.

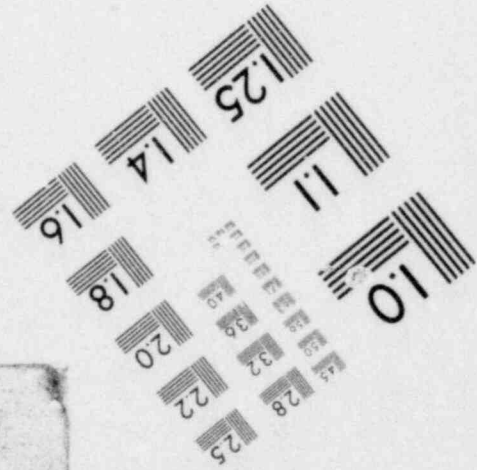
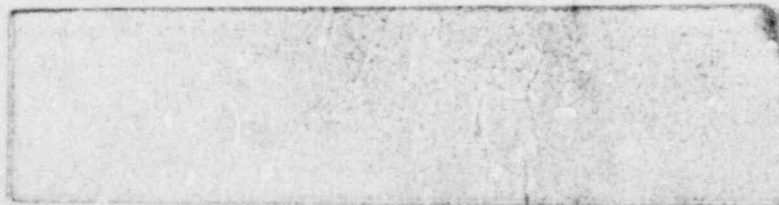
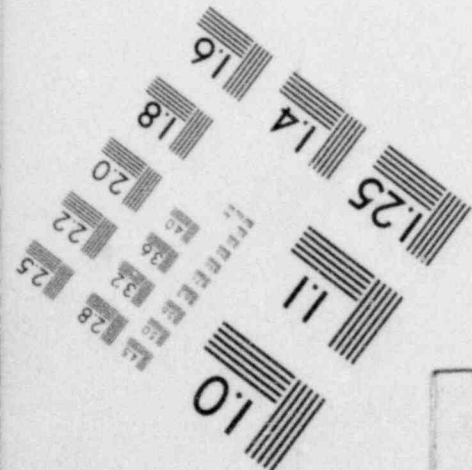
25 Q When you said that sometimes you would



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



MICROCOPY RESOLUTION TEST CHART



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2 review the suggestions and changes made by the plant
3 staff, would that be Mr. Floyd or you who would make
4 those suggestions?

5 A Well, normally suggestions come from the
6 Engineering Department at the respective units that
7 come through there, rather than directly from the
8 operations people. Each unit has their own engineering
9 staff with regard to mechanical, electrical and other
10 aspects of that department.

11 Those kinds of design changes could come through
12 that department rather than through Operations.

13 Q Who was responsible for that in Unit 2?

14 A Overall for Unit 2 would be George Kunder.

15 Q Who is on his staff?

16 A I have gone blank now.

17 Ron Warren is the mechanical engineer.

18 Q Anybody else on his staff?

19 A Excuse me. I sometimes have trouble remembering
20 names.

21 Q Do you know --

22 A I know the other engineers, just can't think
23 of their names right now.

24 Q Do you know about how many people are on
25 his staff?

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A I am not sure of the actual number, no.

Q Would it be one or two more individuals?

A I think he probably has -- there are four or five.

(Continued on Page 14.)

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Q And these are the particular individuals that you would have contact with?

A Yes.

Q Are these the particular individuals that you would meet with when you would come on the Island for the meetings once or twice a month?

A My engineers would meet with them, yes, mostly.

Q When you would come to the Island, who would you meet with?

A I have been -- primarily due to the fact that really on engineering for Unit 2 it has only been a couple of months that our department has had cognizance -- because of the way our system is set up, GPU designs, bills, and goes through the whole startup and testing -- and not until the plant is declared commercial does our department take over. So most of my contacts have really been with Unit 1 since we have had Unit 1 in commercial operations since 1974.

Q But starting December 30, 1978, Unit 2 went commercial, correct?

A Correct.

Q Who would your contacts have been with from December 30, 1978 --

A George Kunder or Ron Warren.

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Q And since December 30, 1978, do you remember how many times you had come to Three Mile Island concerning Unit 2 until March 28 --

A I have not.

Q You had not come from December 30, 1978 to March 28, 1979, correct?

A Not at a meeting on a TMI 2 problem, correct.

Q Have people on your staff come to Three Mile Island from December 30, 1978 to March 28, 1979 concerning Unit 2?

A Probably. I don't really know. I guess the answer to that is yes, we have had people out here.

Q Would they have written memoranda memorializing the meetings on the site?

A No, we don't -- for on-site meetings, we aren't required to have a formal trip report prepared, no.

Q Would your staff have reported to you concerning those meetings?

A The staff, if there were changes to be made, would have prepared the documentation to support the changes, yes.

Q Since there is no documentation, would you conclude that there were no changes to be made during that period?

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A No. There were changes made.

Q There were changes made?

A Yes.

Q Why would there not have been documentation of those changes?

A Well, the meetings were to assist the engineer in what were the problems and what needed to be done, or for him to come out and look at the problem first-hand, so that he could develop the necessary change. The change was then approved and is documented by our documentation that we are required to fill out in support of change modifications.

So they do exist, and we do document what reviews were done.

Q Did you not have any memoranda written by your staff as a result of the meetings concerning TMI 2 from December 30, 1978 to March 28, 1979?

A Correct. And let me put this in context. From that time -- because I know that I remember -- there were no major problems, okay? Or if there were and I was -- I lose track of the timing of things. They may have been the type of things that were in the engineering and were turned back to our parent corporation, GPU. So our organization, to the best of

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my memory, there were no major problems in that area. The problems that did come up are documented by formal letters of "here is the problem and here is what we approve or disapprove" -- "We won't allow you to do that, do something else."

Q Who would those letters have been sent to?

A I would have -- I forget. We have been slipping on our standard distribution of who they are addressed to. When they were addressed to -- I am not sure who they were addressed to, but they would be on several -- some of them would have been addressed, a copy would have gone to both Mr. Kunder and probably was addressed to Mr. Shovlin or Mr. Hawkins -- I don't know -- they are the supervisor of Maintenance and one of the members of his staff. I don't remember which of those two.

Q Mr. Hawkins works for Mr. Shovlin?

A He did at that time.

Q So they would have been sent to somebody back at Met Ed?

A They would have been sent to Three Mile Island. We would be sending them to the supervisor of Maintenance with a copy to Engineering, who originated the change, or to the lead mechanical engineer or his

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assistant. If it would be electrical, the Electrical Department. If it were a quality assurance item, it would have also been sent to the superyisor of Quality Assurance or Quality Control, excuse me.

(Continued on Page 18.)

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MR. YUSPEH: Could we get on the record who was originating the reports? I am not clear whether the letters were coming from somebody at the plant back to Reading identifying the problem or whether engineers are first coming to the plant in the normal course of their business and then sending a letter that identifies a problem.

THE WITNESS: Normally the problem would have been identified either through a telephone conversation or a request for change modification, all right. In either way, our procedures require a formal letter to go back documenting the review that we had done on that change. So the identification of the problem would have been identified here. In any situation there would have been a formal letter going back to document design and the safety evaluation.

MR. YUSPEH: So the letters are coming from the staff and heading back to the personnel at the plant?

THE WITNESS: Right.

Q Who would approve whether or not these changes were to be made?

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2 A For changes to safety related systems, the changes
3 must be approved by the manager of engineering and the
4 manager of quality assurance. They are prepared by an
5 engineer, independently reviewed by another engineer,
6 but then must be approved by those two managers.

7 Q Are those the only people that would
8 be required to approved design changes?

9 A Yes.

10 MS. GOLDFRANK: I would like to request
11 that --

12 THE WITNESS: I did say that is for safety
13 related systems.

14 MS. GOLDFRANK: Right.

15 I would like to request the letters
16 concerning design changes on Three Mile Island
17 that were generated during the period from when
18 it became commercial until March 28, 1979.

19 (Continued on following page.)

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Q With respect to design changes other than safety-related changes, who would approve these changes?

A They can be done on-site without approvals, I guess. They do not require the manager of Engineering and manager of Quality Assurance approvals.

Q So that if you determine that a design change is needed that is not safety-related, it would not require --

A No. To a non-safety-related system, okay. There is a difference.

Q Could you make that distinction, please.

A Yes. There are changes that aren't safety-related changes that are made to a system that is safety-related. But I am not allowed to just myself make those kinds of changes. I am allowed, or the engineers are allowed, to make changes to circulating water system that is totally related with the steam plant portion of the system, without going through the Quality Assurance and Engineering reviews.

Q So that if it is a change that 's connected with a safety-related system, it needs approval?

A Yes.

Q Is that correct?

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A Yes. There are changes -- there are methods of making minor changes, but they still do require the concurrence of the manager of Engineering.

Q Could you explain what type of changes would not require approval?

A All the changes to the industrial waste, yes, industrial waste or sanitary disposal system, drinking water system, even to the turbine itself, those changes would not.

Q Do you remember what changes were made between December 30, 1978 and March 28, 1979 to TMI 2?

A I don't remember. No, I don't.

Q You don't remember any?

A I don't remember any of the details of any of the changes that were made between that time.

(Continued on Page 22.)

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2 The only ones I can remember really -- yes, I do --
3 we were having some packing leak or body to bonnet
4 gasket leaks in certain valves. I believe during that
5 time frame we replaced a valve with a newly designed valve
6 in the reactor coolant system. We did several other
7 types of changes like that in the balance of the plant.

8 Q And where would a record be kept of the
9 changes that were made?

10 A Here and at Reading.

11 Q What kind of documents would embody the
12 changes that were made?

13 A Well, in our office there would be a copy of the
14 approval letter with whatever request we got and the
15 design and the drawings. Here there will be the same
16 records, plus if we initiate the change, in the case of
17 a caulking valve, we did, but if we initiated the
18 change, there would also be a change modification form
19 that is filled out on every modification that is made
20 in Three Mile Island.

21 MS. GOLDFRANK: I would like to request
22 that we be provided copies of the documents that
23 contain the changes that were made from the time
24 that TMI became commercial until March 28, 1979.

25 Q Do you remember who initiated most of the

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changes during that period?

A The plant staff.

Q Did your office initiate any changes during that period?

A Not that I can remember.

Q What is your interrelationship with GPU?

A GPU is a source of technical expertise that is available to Met Edison when we feel that we are getting into an area that we know they have some particular capabilities in, and they will call and ask assistance.

Q Who in particular would you contact at GPU?

A In general, there is no specific -- it depends on the area that you are talking about.

(Continued on following page.)

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If it was a licensing issue, we would contact the
3 Licensing Department. If it was a mechanical issue, we
4 would have contacted the supervisor there. There just
5 isn't any one-person kind of contact.

6

Q What particular areas would you seek to
7 call on GPU for their expertise on?

8

A Well, we have called on them in the way of
9 shaping design, plant operations, safety analysis.
10 Those are three examples.

#11

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Q You say that you did not become involved
12 with Unit 2 until it went commercial, is that correct?

13

A Correct.

14

Q Did you call on GPU expertise anytime from
15 the time that Unit 2 went commercial until March 28,
16 1979?

17

A Not that I can personally remember. I lost track
18 of the timing, whether their involvement was prior to
19 or after that time.

20

Q Would your contacts with them have been
21 through a formal channel, through written memoranda?

22

A No, normally not.

23

Q Normally it would be orally?

24

A Yes.

25

Q By telephone or in person?

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2 A Correct, both, sometimes.

3 Q And would all contact to GPU go through you
4 or would your staff contact people at GPU directly?

5 A My staff could contact them themselves.

6 Q Also would you be notified if GPU was
7 notified by your staff?

8 A I would know, yes.

9 Q Would there be memoranda memorializing such
10 contacts?

11 A No, there would not be a trip report or anything
12 like that. Indeed, I am answering that. There would
13 not need to be one. There may be telephone reports or
14 something like that if it was thought that the discussion
15 was important.

16 Q Is there a general file where telephone logs
17 are kept in your office?

18 A I don't know.

19 Q Do you keep a telephone log of contacts?

20 A No, I don't.

21 Q Do you know if anybody on your staff does?

22 A Not that I know of. Again I keep my reader's
23 file. That is what I think most of our engineers would
24 keep.

25 Q Could you explain what that file is?

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2 A Well, this is nothing formalized with the company.
3 I just happen to keep a copy of letters I write. They
4 are also in our central file.

5 Q And memoranda that you have generated?

6 A Correct.

7 Q So that any memo that you generated to
8 anybody at GPU or on your staff would be contained in
9 that file?

10 A Yes. There will be gaps if for some reason
11 letters are misplaced.

12 MS. GOLDFRANK: I would like to request
13 that we be provided copies of Mr. Fritzen's
14 reader file.

15 MR. YUSPEH: For what period?

16 MS. GOLDFRANK: From the time that TMI 2
17 went commercial until the accident.

18 Q Do you have any contact with Burns & Roe?

19 A I have had one or two contacts with Burns & Roe.

20 Q When would those contacts have been?

21 A I don't know the exact date. They were within
22 the last year.

23 Q And who would you have been in contact with
24 at Burns & Roe?

25 A Scott Ham.

1 Q Anybody else?

2 A I don't remember the other gentleman's name.

3 Scott Ham is project engineer for Three Mile Island 2.

4 Q And the other individual would be with him
5 in what capacity?

6 A There were various individuals that I probably
7 have talked to that worked on TMI 2.

8 Q How frequently did you talk with them in
9 the past year?

10 A Very infrequently.

11 Q What was the contact for?

12 A We were doing some intercommunications like
13 building up some analysis, something applicable to both
14 Units 1 and 2, where they were doing Unit 2 analysis,
15 and our architect-engineer was doing Unit 1 analysis,
16 and we were comparing notes to make sure we were both
17 not missing something or not going down the wrong path.

18 Q You say your architect-engineer was doing
19 analysis on Unit 1?

20 A Correct.

21 Q Analysis of what?

22 A It was the small break LOCA analysis that the
23 Commission had requested a crossconnect to insure we
24 had the right amount of flow into the reactor coolant
25

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2 system for the makeup purification system during small
3 break LOCA.

4 Q The "Commission requested," meaning Nuclear
5 Regulatory Commission?

6 A Correct.

7 Q And what was the result of that analysis?

8 A We have committed and did commit last year to
9 crossconnect the high pressure injection system. What
10 we were doing was an analysis to show that that design
11 which we were getting ready to implement on Unit 1
12 could achieve the acceptance criteria that was required.

13 Q Who were the architectural engineers for
14 Unit 2?

15 A Gilbert Associates.

16 Q You served as an interface between Burns &
17 Roe and Gilbert Associates concerning this analysis?

18 A Correct.

19 Q Did Burns & Roe and Gilbert Associates have
20 any direct contact with each other?

21 A They normally don't, no.

22 Q Did they in this instance?

23 A No.

24 Q Who actually wrote that analysis?

25 A Well, the analysis is not documented presently.

1
2 It is in the process of being documented.

3 Q So when was this analysis begun?

4 A I don't remember the exact time, but it was
5 before December. I don't remember when the commitment
6 said that we would -- it had to be with the first
7 refueling shutdown.

8 Q Who decided that this analysis should be
9 undertaken?

10 A I don't remember how the problem was identified
11 now -- whether it was -- I don't really remember.

12 Q Who would have been the individual to
13 approve this analysis?

14 A Again it will be -- the design with its supporting
15 analysis will be approved by manager of engineering or
16 manager of quality assurance.

17 Q Were you the individual responsible for this
18 analysis?

19 A Well, the analysis of what was required was
20 performed by B&W. The flow calculations to demonstrate
21 that the system performance will meet the B&W calcula-
22 tions was also done by Gilbert, but it is being done by
23 myself too.

24 Q You say that the actual analysis was done
25 by B&W?

A Correct.

SR 12 1c

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Q Could you tell me who at B&W was performing that analysis.

A I don't know the individual there.

Q Who would be the individual that you worked with at B&W concerning this?

A The results would have come through our project manager, Tom Fairburn.

Q Your project manager at B&W?

A Right.

Q And were you doing an independent analysis?

A Not of the B&W analysis, no.

Q Would you review that analysis?

A I would not review it, no.

Q You would accept their analysis?

A Their analysis -- we generally accept their analysis and their quality assurance programs, if they go through to verify that their analysis is correct, yes.

Q Had they finished their analysis with respect to this issue?

A They did, yes.

Q Do you know when they finished it?

A I don't know the exact date. It was several months ago.

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2 Q "Several months ago" meaning before
3 March 28th?

4 A Yes.

5 Q And what would be your responsibility then
6 with respect to this analysis?

7 A Our responsibility in this was to develop the
8 design change to be able to comply with the criteria
9 established if the said analysis was necessary.

10 Q You were undertaking that responsibility
11 prior to March 28th?

12 A We had identified the design change that we
13 were going to make and had submitted the conceptual
14 design to the Commission and given them a schedule
15 for implementing that change, yes.

16 Q Do you know when you submitted that to
17 the Commission?

18 A I don't know the date. I don't remember the
19 exact date.

20 Q Would a copy of that submission be in
21 your reading file?

22 A No. That submission went out through the
23 Licensing Department.

24 Q So you would send that submission to
25 Licensing?

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2 A They prepared the submission based on input
3 from us.

4 Q Would you prepare a memorandum to Licensing
5 concerning the submission to the Commission?

6 A Sometimes we do that. Other times, we just give
7 them an oral report.

8 Q Do you remember what you did with respect
9 to this particular analysis?

10 A I don't remember which way we did this one.
11 Both departments are working so closely to gether that
12 we may not have prepared a formal memorandum.

13 Q Would a copy of that memorandum, if one
14 was prepared, be in your reading file?

15 A It might not have been in mine. I had an
16 engineer under me who was taking charge of that.

17 MS. GOLDFRANK: I would like to request
18 that a search be made if such a memorandum
19 really was written.

20 MR. YUSPEH: Would you describe the
21 memorandum.

22 MS. GOLDFRANK: Concerning referral to
23 the Licensing Department, analysis of design
24 change resulting from an analysis of small
25 break LOCA that was to be submitted to the NRC.

1
2 MR. YUSPEH: Do you know what memorandum
3 she is speaking of?

4 THE WITNESS: I know what she is talking
5 about, yes. I am not sure what the context is,
6 but I know what she is looking for.

7 Q Do you have formal contacts with B&W?

8 A Yes.

9 Q How often?

10 A Depending on the problems we are having, some-
11 times daily. Other times, we may go for months without
12 contacting them.

13 Q Do they contact you?

14 A I guess the answer to that has to be yes, they
15 have.

16 Q In response to inquiries on your part?

17 A Correct.

18 Q Have they ever initiated contacts on their
19 own?

20 A Well, I know they do send out, but not directly
21 to me -- they do send out bulletins and other infor-
22 mation.

23 Q Not directly to you?

24 A Not directly to me, no.

25 Q Who at Met Edison would they send it to?

- 1
2 A They would send it to the plant superintendent
3 or probably the manager of Engineering.
- 4 Q And would that information be circulated
5 to you by these individuals?
- 6 A Sometimes it would be assigned to our group
7 for action. Other times, it would not.
- 8 Q Do you know who particularly at B&W you
9 have contact with?
- 10 A Mr. Fairburn.
- 11 Q And he would be your initial contact always?
- 12 A Yes.
- 13 Q As project manager?
- 14 A Yes.
- 15 Q The individual that you have initial contact
16 with?
- 17 A Yes.
- 18 Q When you make design changes, do you con-
19 tact people in Training as to those design changes?
- 20 A No.
- 21 Q Do you have any contact with the people
22 in the Training Department at Met Edison?
- 23 A Well, the Training Department is just right
24 across the building from us, so we do have personal
25 contact, and if they have a question, we do answer it.

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Fritzen

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Q Do you have any formal contact?

3

A Only in development of our own internal training program does our organization have formal contact with Training.

6

Q Would you explain.

7

A We have been developing a training program for our staff itself, to develop a training program for them in various fields that they need to be aware of.

10

In that context, we work with the Training Department, but not in the context of operator training for the plant staff.

13

Q Who at Training are you working with concerning developing training for your staff?

15

A Since I am not directly in charge of that, I don't know the individual's name.

17

Q Is somebody under you in charge of that?

18

A Roberta Brown has been the individual that has been helping in that area, I believe.

20

Q Is she an engineer on your staff?

21

A She is an engineer that works for Mr. Lefin.

22

Q Is she equal to you, or does she report to you?

24

A I supervise her work as far as the technical quality of the work goes.

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Q At the moment, is there any training offered by Met Edison for your staff?

A Yes.

Q Could you explain what that training is, please.

A There are training lessons that people are supposed to complete.

Q Offered in Reading?

A Yes.

Q Taught by people from Met Edison?

A They are self-taught. They are not formal lecture-type programs.

Q Materials are provided to these individuals, and they are to read them on their own?

A Yes.

Q Is that correct?

A Yes.

Q Who prepares these materials?

A In all cases, I am not sure who prepares them. The Training Department generally has prepared them.

Q Are you consulted as to what the subject matter should be in those training manuals?

A Not me personally, no. Somebody else, I think, sets up what training various individuals will receive.

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Q Do you know who that individual is?

A No, I don't.

Q Would it be someone in your department?

A I am not sure.

Q Are you required to go through this self-taught training?

A To a lesser extent.

Q Can you explain why to a lesser extent you are required?

A Well, the training program is geared to a person's background. In other words, the junior engineer receives a lot more of the training program than does an older individual.

Q Therefore, because of your extensive engineering background in terms of formal education in Pennsylvania State and in the Navy, you would be required not to go through the same extent of self-training sessions?

A That is correct.

Q Who made the determination that engineers should have these self-taught training courses?

A I know it is a company policy that that ought to be done.

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Fritzen

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Q Who would have made that policy?

3

A I am not sure of how high it went to. I guess I don't know whether it emanated from the president, vice-president, manager, what level.

6

Q Are there exams at the end of these self-taught training courses?

7

8

A There were questions to be answered, yes.

9

Q Would they have been exams given in a formal setting or were they questions to be answered on your own?

10

11

A Questions to be answered on your own.

12

13

Q Were these rated?

14

A I don't know the answer to that.

15

16

Q Have you ever gone to a self-taught course where there were questions to be answered at the end?

17

18

19

A I have gone through them, yes, but they are more or less to make sure you have covered the strong points of what the lesson plan was trying to bring out. They aren't really to be graded.

20

21

Q Were they ever evaluated in any way?

22

A I don't know.

23

24

Q Were the ones that you took evaluated in any way?

25

A I don't know.

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Fritzen

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2 Q You never received any comments as to the
3 answers --

4 A Correct.

5 Q -- that you put down?

6 A Correct.

7 Q Were you asked to evaluate this course in
8 any way?

9 A No.

10 Q Did you think it was a worthwhile course?

11 A Some of them are fairly basic.

12 Q Some of them that you took were fairly
13 basic?

14 A Yes.

15 Q Have you ever evaluated the ones that people
16 under you have taken?

17 A No.

18 Q Have you ever heard whether or not they
19 thought the courses were worthwhile?

20 A I think some of them have agreed that they were.

21 Q Are you on any formal committees of Met
22 Edison?

23 A I am on the Generation Review Committee.

24 Q And would you explain what the responsi-
25 bilities of that committee are?

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2 A By the requirements of our license, we are required
3 to review certain documents, one of them being change
4 modifications, procedure changes to any safety related
5 procedure, tech spec changes, and there are some other
6 items.

7 Q What would those other items be?

8 A I am not sure of all the details. I would have
9 to go back and look at them. We review the incident
10 reports --

11 MR. YUSPEH: Licensee Event Reports?

12 THE WITNESS: Yes.

13 MR. YUSPEH: Is there a written description
14 somewhere of what the committee does?

15 THE WITNESS: There is a procedure and there
16 are technical specifications.

17 MR. YUSPEH: Why don't we provide you with it.

18 Q The procedures and responsibilities of this
19 committee would be included in a specific tech spec,
20 is that correct?

21 A Correct.

22 MS. GOLDFRANK: We have copies of the tech
23 spec, and we can find where they are included.

24 Q Could you tell me this. You personally are
25 on this committee?

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- 1
- 2 A Yes.
- 3 Q Is that correct?
- 4 A Yes.
- 5 Q How long have you been on that committee?
- 6 A Since it was formed.
- 7 Q When was it formed?
- 8 A I don't know the date.
- 9 Q Since you have been with Met Edison?
- 10 A Since we got our license.
- 11 Q Since you have been with Met Edison?
- 12 A Yes.
- 13 Q Is there one committee for Unit 1 and
- 14 another one for Unit 2?
- 15 A Yes.
- 16 Q Which committee are you on?
- 17 A Unit 2 committee.
- 18 Q Were you on the Unit 1 committee at any
- 19 point?
- 20 A Yes, I was.
- 21 Q At what point did you become a member of
- 22 the Unit 2 committee?
- 23 A At the inception.
- 24 Q That would be when?
- 25 A About the time the license went into effect.

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Q The operating license?

A Yes.

Q Why were you chosen to be on this committee?

A Because of my experience and background.

Q Do the tech specs set forth who should be on that committee?

A No, they don't. I believe there is a commitment or an experience requirement that must be made by formal committee members, that is part of the commitment that we either by tech spec or by our commitment to one of the ALSI standards.

Q Therefore, because of your background and your experience you fell into the requirement to have that perspective on this committee?

A Correct.

Q Who would have appointed you to this committee?

A I don't know who formally made the appointment, whether it was the chairman of that committee or Mr. Shovlin, manager of engineering. I do not know whether it had to be agreed to higher up. I believe it was probably a combination of the manager of engineering.

Q Mr. Shovlin?

A Yes.

2 Q How long is an appointment on this
3 committee?

4 A For good. It has to be.

5 Q Who does this committee report to?

6 A I believe -- I am not sure of the mechanisms of
7 who the minutes of the meeting go to. They are sent
8 and distributed. I don't know whether they go -- I
9 forgot whether they are addressed to the vice-president
10 or just a copy goes to him or how that works.

11 Q How does this committee interface with,
12 say, PORC?

13 A The committee does not directly interface with
14 PORC. If there is a problem identified, it would be
15 brought to the attention of the superintendent.

16 Q You said that some of the responsibilities
17 of this committee are to review procedure changes and
18 tech spec changes?

19 A Correct.

20 Q Aren't these also the responsibility of PORC?

21 A Yes, they are.

22 Q What would happen if the recommendations
23 made by PORC and GRC differ?

24 (Continued on following page.)

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Fritzen

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SR 14 1c

2 A This would be brought to an appropriate manage-
3 ment attention.

4 Q Do you know who that would be?

5 A Generally, it would be first brought to the
6 attention of the superintendent and asked for resolution
7 of the comments.

8 Q Has that ever happened?

9 A No, not that I can recall.

10 Q It has never happened that PORC would
11 recommend approval of a tech spec and GRC would not
12 recommend approval?

13 A If it has happened, we have gotten together
14 afterwards and agreed which one was right.

15 Q Do you remember --

16 A I don't remember ever having an issue like that.
17 Normally we don't get that far down the road, along
18 where we don't see eye to eye on that, that there is
19 an unresolved question.

20 Q Why are these two committees assigned
21 some of the same responsibilities?

22 A It is felt that an off-site committee adds more
23 objectivity to what is going on in the pressures
24 that are felt at the operating plant, so the Offsite
25 Review Committee is to take away the pressure and add

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objectivity to the review.

Q So the people that are on the GRC at Reading are all off-site people?

A They are all off-site people, except there are two members that can be from the plant staff, that are designated by the plant staff, but they are not required to be there to form a quorum.

Q How often does the GRC meet?

A I believe it is required to meet quarterly. It had been meeting on at least a monthly and sometimes weekly basis.

Q And there are minutes kept of these meetings?

A There are minutes kept of the meetings.

Q How is this information received by the GRC?

A Well, licensee event reports go through our Licensing Department, and every member of the Licensing Department is on that committee. Records are kept of what licensee event reports there are, and a one-for-one check is made then, and we review every one.

On change mods, the same thing is done. There is a record of every change mod that is issued. There is a formal method of knowing what is out and what needs to be reviewed and what needs to be approved.

2 Q Is it correct to say that the GRC would
3 then receive formal forms that have been completed
4 somewhere else in Met Edison and review those partic-
5 ular forms and then recommend approval or disapproval?

6 A They either concur -- "approval" is not quite
7 the right word, since we are not in the approval
8 circuit. We are there to either identify a problem
9 or to say, "We don't see a problem."

10 Q What would your review entail?

11 A If a change mod was reviewed, it would entail
12 the whole design review and safety analysis, although
13 primarily we are supposed to be concentrating on safety
14 analysis.

15 Q Would there be somebody who would present
16 the analysis that went into this change modification,
17 or would you just be getting a form that would then
18 be read and an independent analysis done of that?

19 A This subj would be addressed. A little dis-
20 cussion, in case of a change mod, would be given of
21 what the change is, what the safety evaluation was.
22 The committee would then be satisfied with that
23 presentation or could start asking additional questions
24 about, "Well, what other items need to be considered?"

25 Q Who would give that presentation?

2 A I am the chairman; I shouldn't say "chairman" --
3 I am the head of the Committee on Change Modifications,
4 so it would be myself who would, on change mods, give
5 that.

6 There is another gentleman who is responsible
7 for overseeing procedure reviews. A Licensing member
8 would give the presentation with regard to licensee
9 events or tech spec changes. We would call in
10 additional people if we have a REM.

11 Q Under what circumstances have you called
12 in additional people?

13 A Specifically, electrical change modifications,
14 in which case I would call in the electrical engineer
15 for him to present the change, rather than myself,
16 because that is not my background.

17 Q Would you, with respect to change modifi-
18 cations, consult with other people prior to giving this
19 presentation, or would your presentation be based on
20 written submissions to this committee?

21 A The review is done after the fact. In other
22 words, in general there has always been a formal --
23 we have always gone through this formal procedure chain
24 for getting approval. It has been reviewed, inde-
25 pendently reviewed and signed off by both the manager

2 of Engineering and the manager of Quality Assurance.

3 So it has gone through three level reviews, and
4 this is really one on top of it.

5 I guess what I am saying is that I rely on those
6 reviews of that quality assurance program to see that
7 things were considered. This is sort of to raise the
8 question of what may have inadvertently not been
9 addressed.

10 Q With respect to the change modifications,
11 are you not the individual that would have done the
12 analysis prior to reaching this fourth level of review?

13 A Not necessarily, no.

14 Q Who else would have made some changes?

15 A I am not sure I understand the question.

16 Q Well, as we discussed earlier, you are
17 the particular engineer concerned with design changes.
18 Would that not be encompassed in these change modi-
19 fications reviewed by this committee?

20 A I would have most likely reviewed mechanical
21 design changes. I would not have reviewed the
22 electrical. So in general, I would have been the
23 person that reviewed the mechanical, but I would not
24 have reviewed the electrical.

25 Q But with respect to mechanical changes,

2 you still would be the individual presenting to the
3 GRC the changes that have been made?

4 A Myself or my alternate, yes.

5 Q Does each person on the GRC have an alternate?

6 A Yes.

7 Q And what is the purpose of that alternate?

8 A So when I cannot attend a meeting, he attends the
9 meeting.

10 Q Who is your alternate?

11 A I always get confused. I think it is Ed Skuchas.

12 Q Are you on any other committees of Met Ed?

13 A No, I am not on any other review committees.

14 Q What other committees that do not have
15 review functions?

16 A You mean company-associated or industry-associated?

17 Q First let us take company-associated.

18 A I am on no other company committees.

19 Q What industry-associated committees?

20 A I am a member of some -- and I may be saying
21 the title wrong -- some committees of the B&W Owners
22 Group.

23 Q Is that group composed of members
24 of all plants that have B&W systems?

25 A It is an informal -- and when I say "informal,"

2 it is not a chartered organization. Yes, it is an
3 informal group of all of the B&W Nuclear Steam Supply
4 owners.

5 Q Who else from Met Edison would be a member
6 or represent Met Edison at that group?

7 A Mr. John Hilbish is the official member as far
8 as the Owners Licensing Group is concerned. I believe
9 there is another one that talks about plant operations,
10 and I am not sure which one of the superintendents is
11 a member of that, or which one -- or whether or not
12 he has delegated that to one of his technical support
13 people.

14 Q Who appointed you to this group?

15 A I was asked to head this for our company by the
16 manager of Engineering, two of the subgroups, one on
17 Reactor Vessel Materials, and one on Steam Generators.

18 I also have been the person that is involved
19 with the Subcommittee on Followup Actions as a result
20 of TMI 2.

21 Q How often does this group meet?

22 A The formal group, I'm not sure how often it
23 gets together. We have a meeting in some of the
24 subgroups anywhere from at one-month intervals to two
25 months, and sometimes every six months.

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Q What kind of information is communicated by this group?

A The group I am on talks about common licensing problems. The group I am familiar with talks about common licensing problems and tries to pool resources, and communicate thoughts on the way we are going to come up with the best approach, and where at all feasible, to have a common analysis performed, but is applicable to all plants.

Q Does B&W have a representative at these meetings?

A Yes.

Q Who would that be?

A There are usually various people. I am not sure who it is. I guess it depends on the project you are talking about. Sometimes it is Mr. Ham for the ones I have been involved in. I don't know who else may be involved.

Q Your resume indicates that you held a reactor operator's license between 1966 and '67.

A Yes.

(Continued on Page 52.)

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Q Was that a license from the NRC?

3

A Yes, it was.

4

Q For which plant.

5

A It was for Pennsylvania State University trigger reactor.

6

7

Q Is that an operating plant?

8

A It is a research reactor.

9

Q Are you licensed on either Unit 1 or Unit 2 at Three Mile Island?

10

11

A No, I am not.

12

13

Q Are you familiar with an incident that occurred at Davis-Besse, one in September 24, 1977?

14

A Yes.

15

16

Q When did you become aware of that incident?

17

18

A To the best of my knowledge, it was in reading what was recently submitted, I guess in reference to the bulletin, the NRC bulletin that was put out.

19

MR. YUSPEH: Submitted to whom by whom?

20

21

THE WITNESS: Submitted to our licensing --

22

23

I am not sure who it was submitted to, but it went into our Licensing Department or to whomever

24

25

the NRC submits it. I am not sure if it is

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27

addressed to -- I think it is addressed to the

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vice-president and gets distributed to licensing.

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I might add that I was assigned development of changes, identifying what changes need to be made to Unit 1 as a result of the Unit 2 incident.

MR. YUSPEH: Are you talking about the March 29, 1979 NRC distribution?

THE WITNESS: Yes, Bulletin 7905-A or whatever it was, I don't remember which one, but 7905, whatever.

Q You did not become aware of the September 24, 1977 incident at Davis-Besse 1 prior to March 29, 1979?

A To the best of my knowledge, no, I didn't.

Q You don't remember talking with John Miller concerning this incident?

A Yes, but that I believe was with regard to, "Here is the bulletin."

Q So that conversation was John Miller would have been subsequent to March 28, 1979?

A Correct.

Q Are you aware that any operators knew of this September 24, 1977 incident at Davis-Besse 1?

A I have no knowledge of that, no.

Q What do you know now of the incident at Davis-Besse 1 that occurred on September 24, 1977?

A I guess I understand it was somewhat similar to

15.3

2 what did occur at Unit 2, although not the whole route.

3 I would have to go back and refresh my memory on
4 the bulletin. I can't remember all the details.

5 Q Do you remember hearing anything generally
6 about the incident at Davis-Besse 1 prior to reading
7 the NRC bulletin?

8 A I may have, but not enough that I could state
9 anything positively. It is sort of a little muddy, what
10 happened, when and where.

11 Q Would any information have come out
12 concerning this incident at your owner's group meetings?

13 A None that I attended, no.

14 Q Would those types of incidents have normally
15 been discussed at those meetings?

16 A I guess I can't answer that since I'm not really
17 on the Operations Committee meeting or am I really on
18 the licensing owners group. I have only been involved
19 in special design kinds of functions, so I can't answer
20 that question.

21 Q As far as the meetings that you attended,
22 was this incident discussed?

23 A At the meetings I attended, it would not have
24 been discussed because they were not anywhere connected
25 with that.

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2 They were limited in scope, such that nobody would
3 have had any reason to talk about that incident.

4 Q So that incidents or transients that occurred
5 at other B&W plants were not discussed in the meetings
6 that you attended?

7 A Correct, within the context of anywhere related
8 to the Unit 2 incident or Davis-Besse.

9 Q At these owners group meetings you were
10 basically concerned with design changes, is that
11 correct?

12 A I have been involved with, I don't know if you
13 really call them design changes. I would say it is
14 particular industry problems. There is a solution
15 needed, not necessarily design changes.

16 Q Could you be a little more specific, please.

17 A Well, the two I am involved in are in steam
18 generators, and specifically they are steam generators
19 which have been, and I use the context of a problem
20 that they periodically have leaked. In the Westinghouse,
21 some of the Westinghouse combustion plants have gotten
22 to the point where they were considering replacing
23 them with new ones.

24 So I have been involved in that group to make
25 sure that that doesn't happen at Three Mile Island,

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2 that we do whatever is necessary to keep the steam
3 generators in top notch operating condition.

4 Similarly I have been involved as chairman of the
5 group which has to do with reactor vessel materials.

6 The reactor vessels at TMI are a little peculiar
7 in the way they were made, and as a result there is a
8 problem coming up in the future of demonstrating their
9 capability to operate safely.

10 I am chairman of the group designed to develop
11 and gather necessary technical data to demonstrate the
12 safety of the reactor vessels for continued operation.

13 So that is not really a design change function;
14 it is more a very component analysis-liability aspect.

15 Q Are you aware that the incident at Davis-
16 Besse 1 concerned a premature termination of HPI?

17 A It was mentioned to me yesterday. I probably
18 read it and forgot about it. Somebody told me again
19 that that happened, yes.

20 Q Who mentioned it to you yesterday?

21 A I don't even remember the individual's name.

22 Q Do you remember why the discussion came up?

23 A No, I don't.

24 Q Do you remember or were you ever aware that
25 the incident at Davis-Besse concerned high pressurizer

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2 indication level?

3 A No.

4 Q Are you aware of that now?,

5 A Yes.

6 Q Would that type of thing be an issue that
7 your owners group would be concerned about?

8 A I don't really know.

9 Q Would your particular committee or subcom-
10 mittee be concerned with that type of thing?

11 A I believe if we were aware of it, yes, we would
12 be concerned.

13 Q Do you know why the particular incident on
14 September 24, 1977 at Davis-Besse was not brought to
15 that owners group's attention?

16 A I am not sure if that is the charter of the owners
17 group or not. I guess I can't answer that question.

18 Q When you say you are not sure that is the
19 charter?

20 A Again personally I do not know directly what the
21 charter of the main owners group is, let me put it that
22 way.

23 Q The owners group has a charter that in your
24 opinion limits the subject matter?

25 A No, I don't know what that charter is, so I don't

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2 even know. I am trying to say that I don't know the
3 scope of that owners group, what they are there to do.

4 Q Are incidents at particular B&W plants
5 usually brought to the attention of this owners group?

6 MR. YUSPEH: Excuse me. Aren't all your
7 answers only with regard to the committees that
8 you are a member of?

9 THE WITNESS: Right. That is what I am
10 trying to say.

11 MR. YUSPEH: When you continue to say
12 "the owners group," that is a misnomer because
13 he can only answer with regard to the committees
14 he has been part of. There may have been many
15 other committees, and there may have been
16 activities that you would have no knowledge of,
17 is that right?

18 THE WITNESS: Right.

19 MS. GOLDFRANK: I understand that.

20 THE WITNESS: We are sort of a service
21 organization. If somebody hands us something
22 and says, "Here is a problem, fix it," we will
23 do it, but it's not our job, my group's job,
24 to go out looking for what all the problems have
25 been with regard to all the other plants.

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2 Q With respect to the committees that you are
3 on, you would not then have specific transients brought
4 to your attention? Who would feed these committees the
5 information?

6 A Well, the committee specifically is responsible
7 for reviewing plants. The particular changes that are
8 made to Three Mile Island or particular problems that
9 occur at Three Mile Island -- that committee, meaning
10 the Generation Review Committee, agreed to go back and
11 review, but I don't recall that being under its charter
12 to review the industry experience. Those kinds of
13 things I believe would be done by our licensing group.

14 Q With respect to the owners group, how would
15 your particular committee be given information or who
16 would give a particular committee a problem?

17 A I am trying to remember how the problems I am
18 involved with surfaced. The B&W owners group -- the
19 first one I was involved with had to do with reactor
20 vessel material. B&W had recognized there was a problem
21 and was starting to develop plans on how to take care
22 of that.

23 In preparation for calling the owners together,
24 since it was a several million dollar project of inves-
25 tigation that was involved, we knew it was a generic

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2 issue, and they were going to call us in to present
3 the issue and to ask their support and propose how it would
4 be handled.

5 It was about the same time that Three Mile Island 1
6 had a problem develop with its surveillance holder
7 tubes, in which case we started design reviews and it
8 involved what does Three Mile Island do now that we no
9 longer have surveillance holder tubes in our reactor
10 and how do we get the necessary information to demon-
11 strate and comply with the NRC requirement for
12 providing demonstration of the material behavior of our
13 vessels.

14 About the same time we started realizing it was
15 a little further than what it was, and I guess we
16 helped take the lead with B&W in establishing that
17 program.

18 The B&W owners group is kind of unique in the
19 industry. I think we are the only ones that have what
20 I will call a structure because it is structured with
21 a chairman and people, and we do band together to solve
22 problems jointly.

23 So in that respect, with that one, we launched
24 into a fairly good R&D effort on that material.

25 At the same time -- subsequent to that, management

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2 developed a keen sense of concern with regard to steam
3 generators.

4 I think between ourselves and a few power companies
5 we launched into developing a steam generators subcom-
6 mittee that did nothing but pursue what does the B&W
7 facility -- what do we need to do to prevent the
8 problems that have happened in the facilities occurring
9 through this steam generator.

10 So the problem in that case, because of a problem
11 that started here or because of problems that the
12 industry in general were having and us wanting to avoid
13 those problems -- most of the problems I am aware of
14 started because of some licensing concern that requires
15 additional analysis, such as all the analyses that have
16 been done here, and the realization that it is a lot
17 better when eight people are involved in an analysis
18 being done than when one person tries to do it all
19 himself.

20 Q Do you know whose idea it was to form this
21 owners group?

22 I don't know exactly, but I will bet the credit
23 goes to B&W, themselves, if anything.

24 Q You don't know for sure?

25 A I don't know for sure, but I believe it was B&W.

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2 Q Is every owner of a B&W plant a member of
3 that?

4 A All of the 177 fuel assembly plants. The new
5 vintage plants are not members. I think it is more
6 because of the contractual arrangement that they are
7 in, rather than because of anything else.

8 Q Do you know if there are any B&W personnel
9 on the site at TMI?

10 A Yes.

11 Q What positions do they hold?

12 A Well, I know Lee Rogers, who happens to be the
13 local representative, site representative for B&W.
14 I only know one other person on the staff, whose name
15 I don't recall, and I don't really know his function
16 or position.

17 Q What is his name?

18 A It is Stan Maingi.

19 Q Do you know if the B&W has any engineers
20 on site?

21 A I know they have engineers on the site, yes.

22 Q Do you have contact with them?

23 A No, not routinely.

24 Q When would you have contact with them?

25 A Usually our circuit is through the Lynchburg

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2 engineering circuit. There are some times when, if
3 there is an indication of a mechanical engineer here
4 saying that a question had been raised to the site
5 office, then I would go and either ask a parallel ques-
6 tion or ask him if he got back to Lynchburg to please
7 assure that they address it.

8 Q Do you know the purpose for having these
9 B&W engineers on the site?

10 A Their purpose was really to allow, I believe,
11 quick access to the plant -- I don't know how to say
12 it -- to information that B&W can supply.

13 Q So that these B&W engineers would have
14 contact on site with the operators and supervisors at
15 TMI?

16 A Yes.

17 Q Do you know the purpose for having them
18 contact these B&W engineers, as opposed to contacting
19 you?

20 A It speeds up communication.

21 Q Just by example, could an operator call the
22 B&W engineer who is on site if he chose to?

23 A I can't answer that. I don't know.

24 MR. YUSPEH: You don't know the procedure?

25 THE WITNESS: I don't know if there is any

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restrictions on whether he can or can't. I assume the shift supervisor could. I don't know if the operator would call. I assume the shift supervisor could call up and ask.

MR. YUSPEH: Do you know, Jeff, how or what the sequence was if somebo' on site wanted to talk to the B&W people or are you just surmising?

THE WITNESS: No, I am just surmising it. I really don't know if there is any formalized procedure for contacting B&W.

Q Do you know of incidents where B&W engineers on site would have been contacted and you were not contacted as to an inquiry?

A I wouldn't be involved in that circuit.

Q So it is possible that they would have been contacted and you would not know about it?

A Right.

Q Do you know why the B&W design was chosen?

A No, I do not know details of that.

Q Did you have any input into the control room design?

A No.

Q Do you know who did?

A No.

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2 Q Do you have any direct contact with NRC?

3 A Very rarely.

4 Q Under what circumstances would you have
5 contact?

6 A If I was involved in the design and there was a
7 very technical -- the licensing group could not field
8 the technical question, I would go off and answer a
9 specific technical question under those rare circum-
10 stances.

11 Q Were there any circumstances with respect
12 to that concerning TMI 2 that you had contact with NRC?

13 A No.

14 Q Were you on site on March 28, 1979?

15 A No.

16 Q Were you called in at any time after 4:00 a.m.
17 on March 28, 1979?

18 A No.

19 Q What had been your responsibility since the
20 March 28 accident?

21 A Mainly to develop those changes that needed to
22 be made to Unit 1 as a result of the TMI 2 incident,
23 to help in that, not take charge of it, but to be a
24 person to help identify that.

25 Q Who is in charge of that?

16.15

2 A Right now that is Mr. Dave Sher of GPU Service
3 Corporation.

4 Q And you report to him?

5 A Informally, yes.

6 Q Informally?

7 A Indirectly. By chain of command I don't usually
8 report to him, but he has been assigned that responsi-
9 bility, and I work with him.

10 Q Who do you report to directly?

11 A I still report directly, as far as administrative
12 and everything else, to Mr. Levin.

13 Q Do you have contact with Gary Miller?

14 A I have contact with him, you know. If I need
15 something, I can call Gary Miller, yes. I don't normally
16 have contact with Gary Miller.

17 Q What things would you need that you would
18 contact him for?

19 A If I wanted to, you know -- it would be one of
20 those items where I thought I really needed management,
21 some management person to, shall we say, expedite some
22 information or expedite something. We normally do not
23 need to do that.

24 Q In other words, it would be an administrative
25 kind of contact?

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2 A Yes.

3 Q You would want him to speed up getting you
4 information or getting something done, is that correct?

5 A Correct.

6 Q Do you have contact with Mr. Logan?

7 A I have had one contact with Mr. Logan, yes.

8 Q For what reasons would you have contact
9 with him?

10 A It would normally be in relationship to a design
11 change, a plant problem.

12 Q For what specific purpose?

13 A I guess he has called once or twice to say, "Hey,
14 I have got a problem and I need an answer today."

15 Q What kind of information would you seek from
16 him?

17 A In general it would have been the other way around.
18 He has been seeking information from me. I find that
19 working directly with the technical people suffices.

20 Q What kind of information would he seek from
21 you?

22 A He was after approval of a design change because
23 of a leaky valve.

24 Q So he would submit to you approval for
25 design changes?

2 A No. I believe he called up to insure that the
3 design change was expedited, for basically that specific
4 purpose. He was not doing the design.

5 Q You would do the design change, and he
6 would call to inquire as to whether or not this was
7 being pursued?

8 A No. This was a very special case. The reason he
9 called was strictly administrative, to make sure that
10 we were working promptly.

11 Q And is that usually the reason why he would
12 contact you?

13 A Yes, it would be the reason he would. He would
14 normally contact Mr. Klingaman first. It so happened
15 today Mr. Klingaman wasn't around.

16 Q Do you remember specifically on what specific
17 matter he contacted you?

18 A We had a leak in a valve in the balance of the
19 plant in the steam system, and they wanted approval to
20 do a specific repair on a valve.

21 Q Could you explain to me what the term
22 "generic" means to you?

23 A "Generic" means that all plants, all B&W 177 plants
24 have basically the same problem. They are the same
25 design, and if one plant has a problem, they all have it.

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Q So that if one plant had that problem, it would mean all the B&W plants would have that problem?

A When I say "generic," that is what I mean. It doesn't necessarily follow that when you get into the uniqueness of some of the plants, that just because one plant has a problem that all that have been designed exactly the same way -- it doesn't necessarily follow.

It follows when you are talking about accident analysis, those kinds of things that are in general generic, because that is what all the B&W analysis is based on is generic. The balance of the plant is so unique that you can't make that, to say that because one B&W plant has a problem, that they all do, once you get away from basically the nuclear steam supply system.

Q Do you have any input into the formulation of containment isolation criteria?

A No.

Q Could you explain to me what is meant when something is safety related?

A By "safety related" we generally mean the reactor coolant system or those components that are necessary to mitigate the consequences of an accident or, to go a little bit further, and define those systems whose

2 failure could result in release of radioactivity to the
3 environment. That in a nutshell is the ground rules
4 for safety related, although I do not necessarily find
5 a clean line between what is and what isn't.

6 As a result of that, we probably have some items
7 under the scope that are really not quite fitting that
8 definition.

9 Q What is the procedure for handling a safety
10 concern at Met Edison?

11 A You mean if somebody is asking you to do a review?

12 Q Let us say somebody asked you to do a
13 review of something that was a safety concern.

14 A It would get tasked under the task system we have.
15 It would get assigned to the engineer with a due date.
16 The engineer would document his results in writing and
17 then submit it back to the originator.

18 Q Who would originate those inquiries?

19 A Anybody in the company could really do it --
20 licensing. It is not restricted to who can identify a
21 problem.

22 Q Are memoranda kept by your department?

23 A Yes.

24 Q Has your department ever initiated inquiries
25 with respect to safety concerns?

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Fritzen

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2 A Yes.

3 Q And your department would do that analysis?

4 A We would probably coordinate it. We may not do
5 the formal analysis.

6 Q Who would you coordinate it with?

7 A Well, if the analysis required -- it would be
8 probably the vendor or the architect-engineer who was
9 more familiar with it. If it required an accident
10 analysis for something B&W did, under the normal scope
11 and prevention of that, it would go back to B&W. If
12 it was a valve and required additional analysis on the
13 valve, it would probably go back to the valve vendor
14 or a consultant. If it were something to do with the
15 design of the balance of the plant, it would go to the
16 architect-engineer. If it was a capability that didn't
17 exist in GPU, we would now have the option to go to
18 them.

19 Q With respect to safety concerns that are
20 raised by other divisions of Met Edison and sent to you
21 for analysis, do you contact either the vendor or the
22 architectural engineer or do you perform an independent
23 analysis?

24 A In general we do not do the analysis ourselves
25 that requires a detailed analysis.

2 Q Under what circumstances will you do the
3 analysis yourself?

4 A If it is a very minor job.

5 Q Can you be specific about some analyses
6 that you have done?

7 A Maybe it is material analysis. There are items
8 for adding small piping, extending it, which does
9 not require sophisticated analysis. It does not
10 require a computer analysis in order to determine the
11 stress in the pipe.

12 We would do these kinds of jobs.

13 Where we now get to the point that it requires
14 computer analysis and techniques that we don't have,
15 then we go back to the people that hae them, which in
16 general are the people who bid the design.

17 Q So you would, for Unit 2, go to Burns & Roe
18 or Babcock & Wilcox?

19 A Right.

20 Q Or you would hire another consultant if
21 it was a sophisticated analysis that was required?

22 A I think that is a fairly good assessment, yes.

23 (A brief recess was taken.)

24 MS. GOLDFRANK: Back on the record.

25 Q Do you know what the background is of your

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1 superior, Mr. Lefin?

2 A I just know he has had a lot of experience,
3 but I can't tell you the details.

4 Q Do you know specifically what his educa-
5 tional background is?

6 A Mechanical engineer.

7 Q With respect to the B&W engineers on this
8 site, are you of the opinion that they have the most
9 current thinking with respect to engineering?

10 A I can't answer that.

11 Q You do not know under what conditions Met
12 Edison relies on those people?

13 A No, I can't answer that.

14 Q With respect to the engineers in your
15 department, do you have the most background with
16 respect to engineering?

17 A There may be one other individual that has
18 equivalent or more engineering background.

19 Q Who would that be?

20 A Besides me and Mr. Lefin, there is a person we
21 recently acquired -- his first name I do not know,
22 but everybody calls him "Dick" -- Reed.

23 Q When did he start with Met Edison?

24 A Just a little less than a year ago or maybe more,

2 around a year.

3 Q Could you describe the Engineering
4 Department at GPU?

5 A I can't give you a formal structural description.
6 They have expanded quite a bit.

7 Q They have expanded within the last year,
8 or more recently than that?

9 A About a year, maybe two years, yes.

10 Q Expanded in personnel and in depth?

11 A Yes.

12 Q Would engineers at GPU have experience
13 equivalent to yours?

14 A A lot of them, I think, probably have more, yes.

15 Q Do you know how many people are in that
16 department now?

17 A In total, I don't know.

18 Q Are you talking about four or five people?

19 A No, I am talking about double our size, probably.
20 I don't know. I can't answer it. I would assume it
21 is 60 or 100 or more.

22 Q With respect to safety concerns that were
23 raised prior to March 28, 1979, issues that were
24 raised and forwarded to your department, were there
25 any issues raised with respect to the PORV?

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2 A Well, there was an incident at Unit 2, and it
3 was looked at for Unit 1. It was electrical, not
4 mechanical.

5 Q Were there any issues with respect to
6 safety complaints raised with respect to the control
7 room design?

8 A No.

9 Q What about pressurizer indication level?

10 A None as far as its adequacy.

11 Q What were the concerns raised?

12 A Seismic qualification of the instrument on
13 Unit 1.

14 Q Nothing on Unit 2?

15 A Unit 2 was handled by GPU.

16 Q Why is that?

17 A At the time, the plant was in construction,
18 and GPU handled all construction engineering matters.

19 Q Were there any safety concerns raised
20 with respect to the issue of going solid?

21 A There was none in the context of the Unit 2 type
22 of incident. There was overpressure protection con-
23 cern, which had to do with going solid at low tempera-
24 tures.

25 Q Who would have raised those concerns?

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2 A I believe that was raised by the Nuclear Regula-
3 tory Commission. Our Licensing Department -- let me
4 put it this way: I do not know where they got it.
5 I don't know.

6 Q Do you know how that concern was resolved?

7 A We submitted a proposed tech spec change
8 limiting the way we would operate the plant.

9 Q Was that tech spec change reviewed and
10 approved?

11 A By us?

12 Q By Met Edison, yes.

13 A It was reviewed and submitted to the Commission
14 for approval, yes.

15 Q Do you know if it was approved?

16 A I believe it has not been approved yet. Again
17 I am speaking -- I don't know what they did -- I am
18 speaking of 1. I don't know what they did on 2.

19 Q Do you know if there were safety concerns
20 raised with respect to containment isolation?

21 A I know of no safety concerns about containment
22 isolation.

23 Q Do you know if there were safety concerns
24 raised with respect to the emergency feedwater valves?

25 A No.

2 Q Would the concerns that were raised with
3 respect to the PORV and the pressurizer indication
4 level and the concerns of going solid, -- would those
5 concerns have been written to you in memorandum form?

6 A They were not. They could have.

7 Q They were not in these particular instances?

8 A There was nothing in writing that I have seen,
9 with regard to -- prior to the accident. There is
10 nothing that I saw like the Michelson Report or any-
11 thing else that would have raised the flag, so to
12 speak.

13 Q So that when these concerns were raised,
14 they were raised to you orally?

15 A What I am saying is I guess my first knowledge
16 was reading the Michelson Report, which if you say
17 where did I see it in writing, that said there is a
18 problem, was the Michelson Report. That report was --
19 I don't remember when it was issued.

20 Q Well, we have been discussing earlier
21 that there were some safety concerns raised, and in
22 particular you said the Licensing Department raised
23 concerns, and that you then evaluated these.

24 Would those concerns have been raised orally?

25 A No. If they wanted assistance, they would have

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2 written an action item to us and said, "Please
3 provide answers for the following questions." That
4 would have gotten to our task system and would not
5 have been oral.

6 I believe I answered your question.

7 Q Yes.

8 MS. GOLDFRANK: I would like to express
9 that the written memorandum with respect to
10 safety concerns raised concerning the PORV,
11 pressurizer indication level, and going solid
12 that would have been directed to Mr. Fritzen --

13 THE WITNESS: There was one on the issue
14 that the NRC or whoever raised, and it went back
15 to the NRC, that, in fact, when you have shut
16 down, there was the possibility of over-
17 pressurizing the plant. This was several
18 years ago, about two or three years ago, and
19 it was on the issue of the pressurizer level. I
20 don't know if there was ever anything on the
21 PORV, so I can't answer if there is such a thing.

22 Q But if there is a memorandum that would
23 indicate that there was a concern raised --

24 A I don't even know if there was one.

25 MS. GOLDFRANK: I would request that a

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search be done to see if there was.

MR. YUSPEH: Who are they from?

MS. GOLDFRANK: They would evidently be generated by various people within Met Edison.

THE WITNESS: In each case, this would be with regard to Unit 1, not necessarily with respect to Unit 2.

MS. GOLDFRANK: If they concerned Unit 2.

MR. YUSPEH: If they concern Unit 2?

THE WITNESS: The first two would not be in our files. It would have only concerned Unit 1, the pressurizer level and overpressure concerns. Whether it anything with respect to the PORV, that is another matter.

MR. YUSPEH: If there is anything on the three subjects concerning Unit 2, you would like it?

MS. GOLDFRANK: Right.

Q You mentioned a reference to the Michelson Report. When did you first become aware of this?

A After the accident.

Q Are you familiar with something called the Novak Memorandum?

A Not by that title, no.

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Q Do you know who Mr. Novak is?

A I have heard the name. I can't recall specifically who he is.

Q Are you familiar with any memoranda written by the NRC concerning pressurizer indication levels prior to the accident at Three Mile Island?

A No.

Q Are you familiar with any memorandum written by the NRC prior to the accident at Three Mile Island concerning premature termination of HPI?

A No.

Q Are you familiar with any memorandum written by Babcock & Wilcox concerning premature termination of HPI prior to the Three Mile Island 2 accident?

A No.

Q Are you familiar with two memoranda written by Bert Dunn of B&W concerning premature termination of HPI?

A No.

(Continued on Page 81.)

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Q You are not familiar with those two memo-
randa today?

A No.

Q Can you explain to me how the transfer from
GPU to Metropolitan Edison occurred with respect to
TMI 2 going commercial?

A Yes, I guess I can. Up until the point TMI 2 went
commercial, engineering responsibility rested with GPU
Service Corporation.

Q Up until December 30, 1978, the responsi-
bility was with GPU?

A Right. Once, however, our license went into
effect, the requirements for review, et cetera, also
were in effect, and GRC 2 was actually constituted.

When the plant was declared commercial from an
engineering standpoint, not operations -- operations
was continuous, always under Met Ed -- but from the
engineering standpoint, the plant contacted the Met Ed
engineering staff for resolution of the problems
rather than GPU. Then we just completely switched
right in, taking over resolution to any problem that
required engineering support.

Q What was the contact prior to December 30,
1978?

1

Fritzen

82

18.2

2 A I don't know who their contact was at GPU.

3 Q So you personally did not have any involve-
4 ment prior to December 30, 1978?

5 A Prior to -- yes.

6 Q Is that correct?

7 A That is correct except for one or two isolated
8 cases that we had been asked to do some specific review
9 on.

10 Q Do you remember if there were isolated
11 cases?

12 A There was one I remember.

13 Q What would that have concerned?

14 A An independent review of turbine plant piping
15 snubber support anchor seal.

16 Q Why would you have been asked to look into
17 that matter?

18 A The General Office Review Board raised the issue,
19 and for some reason it was assigned to Met Ed to do the
20 review rather than GPU.

21 Q And you undertook that review?

22 A Another engineer and myself.

23 Q And reported back to GORB?

24 A Yes. We wrote a letter back to GORB -- I believe
25 it was to GORB -- we wrote a letter, I don't remember

18.3

2 who we addressed it to. I think we addressed it to the
3 project manager for GPU at the time. I don't think we
4 reported it directly back to GORB. We brought the issue
5 back to GPU's attention.

6 Q Once you became in control of the
7 engineering, after TMI 2 went commercial in December 30,
8 1978, were you briefed as to decisions that were made
9 prior to TMI 2 going commercial?

10 A No.

11 Q Did you meet with people at GPU to discuss
12 certain decisions that were made?

13 A Not an overall briefing. I did not attend the
14 meetings. There were other people -- people did come
15 down and give a presentation on some of the items that
16 were continuing and that continued to need to be done,
17 where they were, but there was no specific briefing
18 that sat down and said, "Hey, here is everything that
19 happened in the design of Three Mile Island. You are
20 fully up to speed."

21 Q There was a presentation made by certain
22 people at GPU to the people on your staff?

23 A Yes, the Met Ed people.

24 Q Why were you not in attendance at that
25 meeting?

18.4

2 A There was something going on that -- I had another
3 commitment.

4 Q So you would have been included if another
5 commitment hadn't had a conflict?

6 A Yes.

7 Q Do you remember what that other commitment
8 was?

9 A No, I don't. Again, this was only on issues that
10 were -- these were specifically with regard to design
11 projects that were underway and were to be instituted
12 at the first refueling. So it was not to go over what
13 the whole history was, to say, "Here are things that
14 were under way that we are still working on that need to
15 be done. We want you to be aware of them because they
16 are going to come up in the first refueling." So they
17 were in that limited context.

18 Q And with respect to those issues, Met Ed
19 would have responsibility; GPU had withdrawn at that
20 point?

21 A Certain issues GPU was going to continue the
22 technical follow-up on.

23 Q Which issues were those?

24 A I don't remember all the details. I only remember
25 two that they were continuing to follow; that was the

18.5

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Fritzen

85

2 design, again, for the Unit 2 high pressure injection
3 line small break fix, and there was another one raised
4 on some feedwater system changes. Since they had been
5 so deeply involved in the start of the engineering, they
6 were going to continue to handle that for Met Ed.

7 Q Do you remember specifics of those particular
8 issues that GPU was concerned with?

9 A I know basically the high pressure injection fix
10 was the same, basically the same, as we were going to
11 institute on TMI 1.

12 Q That was a result of this B&W analysis that
13 we referenced earlier?

14 A Yes.

15 Q Was there any written memoranda concerning
16 these particular issues that GPU was going to have a
17 continuing input on?

18 A I don't know.

19 Q You did not receive any memorandum concerning
20 that?

21 A I can't remember if I did.

22 Q Would you have retained those memoranda?

23 A No.

24 Q Would you have delegated those memoranda to
25 somebody else on your staff?

18.6

2 A I don't have a person that just keeps track of
3 items like that, no.

4 Q Could you explain what you feel the morale
5 was at Met Ed prior to the accident at TMI 2?

6 A Prior?

7 Q Right.

8 A Excellent.

9 Q Concerning promotions or integration
10 between the various units, was that good?

11 MR. YUSPEH: Would you state the question
12 again?

13 Q Concerning integration between the various
14 units?

15 A I guess -- I can't answer that.

16 MR. YUSPEH: What is the question?

17 THE WITNESS: Morale between integration of
18 the two units, as I understand it.

19 Q The working relationships between the people
20 within the various divisions within Metropolitan Edison?

21 A You mean between us and Unit 2 engineers and
22 Unit 1 engineers, or between Unit 2 engineers and Unit 1
23 engineers?

24 Q Within Unit 2, the relationship between
25 the supervisors, let's say, and engineers?

18.7

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Fritzen

87

2 A I guess I can't answer that not having experience.

3 Q The particular individuals that you have
4 contact with, Mr. Kunder or Gary Miller, would you say
5 that your relationship was good?

6 A Yes.

7 Q What kind of working hours would you
8 normally keep?

9 A Normally, I guess you would say 8:00 to 5:00
10 except when there are problems which does not happen
11 very often except during refueling additives where they
12 may go up to 12-hour days, and periodically a couple of
13 weekends.

14 Q Are you paid overtime?

15 A No, we are not.

16 Q Do you feel that your chances or the oppor-
17 tunity for promotion within the Metropolitan Edison
18 organization are good?

19 A I like my job. Promotional reasons are not the
20 reasons I am happy.

21 Q But do you feel there are promotional
22 opportunities?

23 A Yes.

24 Q Do you feel that there are good lines of
25 communication between GPU and Met Ed?

18.8

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Fritzen

88

2 A When we need to, we develop good lines of commu-
3 nications.

4 Q Are there open channels of communication?

5 A Yes.

6 Q And you would not hesitate to use those
7 channels?

8 A When we need them, we don't hesitate.

9 Q What type of communications is there between
10 Metropolitan Edison and Jersey Central Power & Light?

11 A In my contact there isn't.

12 Q You have no direct contact with anybody at
13 Jersey Central?

14 A Correct.

15 Q Would your superior have contact with any-
16 body at Jersey Central?

17 A Mr. Lefin normally would not.

18 Q Under certain circumstances he would?

19 A I don't know. I don't know of any time he has.

20 Q Were you aware of a time schedule that Met Ed
21 was functioning under to bring TMI 2 into commercial
22 operation?

23 A There is always a schedule, yes. There is always
24 a schedule for getting any unit either back on the line
25 or into commercial operation.

1

2 Q Who would have established the schedule
3 with respect to bringing TMI 2 into commercial operation?

4 A I don't know.

5 Q You had no input into that schedule?

6 A No.

7 Q Were you aware that for various reasons
8 the schedule was not met?

9 A I guess the answer to that has to be yes. It is
10 part of the facts of life; you never meet your schedule.

11 Q Do you know factors that went into deter-
12 mining that TMI 2 would become commercial on December 30,
13 1978?

14 A No.

15 Q You had no input into that?

16 A No.

17 Q I believe at this time we will recess this
18 deposition, that at the moment we don't anticipate that
19 we would have further questions to ask you, but there
20 is a chance that we would want to call you back at some
21 future date.

22 (The deposition was concluded at 12:00 noon.)

23

24 Jeffrey Frederick Fritzen
Subscribed and sworn to before me
25 this _____ day of _____ 1979

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I N D E X

<u>WITNESS</u>	<u>DIRECT</u>
Jeffrey Frederick Fritzen	2

E X H I B I T S

<u>FRITZEN DEPOSITION FOR IDENTIFICATION</u>	<u>PAGE</u>
1 Resume of Jeffrey Frederick Fritzen	4

o0o

C E R T I F I C A T E

1
2
3
4 STATE OF NEW YORK)
5 COUNTY OF NEW YORK) ss:

6 We, STEPHEN McCRYSTAL, a Notary Public of the
7 State of New York, and STANLEY RUDBARG, a Certified
8 Shorthand Reporter and Notary Public of the State of
9 New York do hereby certify that the foregoing deposition
10 of JEFFREY FREDERICK FRITZEN was taken before us on the
11 19th day of July, 1979.

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

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

18 We are not related by blood or marriage to
19 any of the said parties, nor interested directly or
20 indirectly in the outcome of this matter, nor are we in
21 the possession of any of the counsel.

22 IN WITNESS WHEREOF, we have hereunto set
23 our hands this 19th day of July, 1979.

24 Stephen McCrystal
25 Stephen McCrystal

Stanley Rudbarg
Stanley Rudbarg, CSR

1. Q Who would have established the schedule
2 with respect to bringing TMI 2 into commercial operation?

3 A I don't know.

4 Q You had no input into that schedule?

5 A No.

6 Q Were you aware that for various reasons
7 the schedule was not met?

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9 part of the facts of life; you never meet your schedule.

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11 mining that TMI 2 would become commercial on December 30,
12 1978?

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16 Q I believe at this time we will recess this
17 deposition, that at the moment we don't anticipate that
18 we would have further questions to ask you, but there
19 is a chance that we would want to call you back at some
20 future date.

21 (The deposition was concluded at 12:00 noon.)

22 Jeffrey Frederick Fritzen
23 Jeffrey Frederick Fritzen

24 Subscribed and sworn to before me
this 30th day of August 1979

William L. ...
Notary Public

BENJAMIN REPORTING SERVICE

NOTARY PUBLIC

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

Corrections to July 19, 1979, Deposition of Jeffrey Fritzen

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
5	8	for -- in general,	in
5	9	and I guess preparation	preparation
5	19	tested the required exposure	tested to the required exposure
6	5	design for the	design on a
6	6	Ship Refueling, did	Ship Refueling concept and did
6	7	refueling, at which time	refueling. After which
6	12	theoretical course?	theoretical or practical course?
6	13	Combination, both	Combination of both
6	17	what we had	what we had learned
7	12	went through, I think	went through I don't know but, I think
8	13	created ---	created about then ---
8	21	although	as
8	23	a structure department	a departmental
8	25	of the Metropolitan, you know, when I came, the	of the

Jeffrey Fritzen
Jeffrey Fritzen

Subscribed and sworn to
before me this 3rd day
of AUGUST, 1979

William S. [Signature]
Notary Public

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

Corrections to July 19, 1979, Deposition of Jeffrey Fritzen

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
9	2	Section was	Section. It
10	2	be two	be at TMI for
11	3	support that	support operations
11	6	to support that	to support operations
11		that effort these	
11	11	or supervisor or	, the supervisor of
12	11	well, it	well, there
12	13	interviewing	engineering
12	15	to ourselves	or ourselves
12	19	in this area	in an area
12	23	gone about	and proceeded
13	10	that department	of the plant
13	11	could	would
13	12	that	those
14	15	builds	builds
15	15	realizing	summarizing

Jeffrey Fritzen
Jeffrey Fritzen

Subscribed and sworn to
before me this 3rd day
of August, 1979

Richard L. House
Notary Public

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

Corrections to July 19, 1979, Deposition of Jeffrey Fritzen

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
16	20	because I know that I remember	to the best of my memory
16	21	Or if there were and	Or if there were,
16	22	I was -- I lose track of the timing of things.	, I lose of the timing of things,
16	23	that were in the	that were
16	24	engineering and were turned	turned
16	25	So our organization	So far our organization
17	3	slipping	shifting
17	10	When they were addressed	Who they were addressed to
17	11	they were addressed to, but they would be on several --	exactly, I am not sure but they would be to one of several

Subscribed and sworn to

before me this 31 day

of August, 1979

Robin Schenck
Notary Public

Jeffrey Fritzen
Jeffrey Fritzen

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

Corrections to July 19, 1979, Deposition of Jeffrey Fritzen

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
17	11	some of them would have been addressed,	persons and
17	13	Mr. Kunder and	Mr. Kunder. It
17	24	to Engineering	to the engineer
18	17	identified here.	identified here (TMI).
20	4	approvals, I	approvals.
20	5	guess. They	They
21	2	Yes. There are changes -- there	Yes, except for minor changes. There
22	3	leak	leaks
22	16	plus if we initiate the change, in the case of	if they initiated the change such as in the case of
22	17	a caulking valve, we did, but	the leaking valve. But
23	9	Met-Edison	Metropolitan Edison

Jeffrey Fritzen
Jeffrey Fritzen

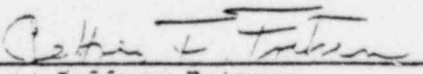
Subscribed and sworn to
before me this 3rd day
of August, 1979

William J. C...
Notary Public

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

Corrections to July 19, 1979. Deposition of Jeffrey Fritzen

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
23	11	capability in, and	capability in. In these cases we will
23	13	specific -- it	specific individual. It
23	3	any one-person	a one person
24	9	shaping design, plant	sizing design, pump
24	17	lost	lose
25	12	like that. Indeed, I am answering that	like that.
26	25	Scott Ham	Scott Dan
27	4	Scott Ham	Scott Dan
27	13	intercommunications like	small break LOCA
27	14	building up some analysis	high pressure injection flow analysis
27	15	Units 1 and 2, where they	Units 1 and 2. They




Jeffrey Fritzen

Subscribed and sworn to

before me this 3rd day

of AUGUST, 1979



Notary Public

NOTARY PUBLIC

Muhlenberg Twp., Berks County, Pa.
My Commission Expires December 14, 1981

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

Corrections to July 19, 1979, Deposition of Jeffrey Fritzen

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
27	24	requested a crossconnect	requested. It involved a cross-connect
28	14	Unit 2	Unit 1
29	6	-- it	be required to have it installed.
29	11	now -- whether it was --	it now. It
29	14	be -- the design with	be approved later with the design change package and with
29	15	analysis with	analysis. It will
30	17	program, is	program
31	9	established in the said analysis was necessary	established by the B&W analysis.

Jeffrey Fritzen
Jeffrey Fritzen

Subscribed and sworn to
before me this 30th day
of AUGUST, 1979

William S. [Signature]
Notary Public

NOTARY PUBLIC
Muhlenberg Twp., Berks County, Pa.
My Commission Expires December 14, 1982

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND


Corrections to July 19, 1979, Deposition of Jeffrey Fritzen

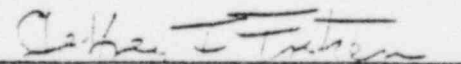
<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
32	11	departments are	departments were
33	20	send out	send out various information
33	21	to me -- they	to me. They
37	23	that that	that it
42	9	that must be made	that must be met
42	11	that we either	that we have either
42	12	ALSI	ANSI
42	21	Mr. Shovlin	Mr. Klingaman
42	23	engineering	engineer, and the chairman

Subscribed and sworn to

before me this 3rd day

of AUGUST, 1979


Notary Public


Jeffrey Fritzen

NOTARY PUBLIC

Muhlenberg Twp., Berks County, Pa.

My Commission Expires December 14, 1984

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

Corrections to July 19, 1979, Deposition of Jeffrey Fritzen

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
42	24	Mr. Shovlin?	Mr. Klingaman?
43	4	For good. I has to be	For good, at the present time.
43	6	I believe --	I believe to the Vice President
43	9	I don't know whether they go -- I	I
44	17	road, along	road
45	16	Department, and every member	Department. A member
47	10	people if we have a REM	people if we have a need.
47	22	always been a formal --	already been a formal review and approval process.

Subscribed and sworn to

before me this 3rd day

of AUGUST, 1979

William S. Renshaw, Jr.
Notary Public

Jeffrey Fritzen
Jeffrey Fritzen

NOTARY PUBLIC

Muhlenberg Twp., Berks County, Pa.

My Commission Expires December 14, 1984

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

Corrections to July 19, 1979, Deposition of Jeffrey Fritzen

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
50	11	that, or which -- or whether	that, or whether
51	9	but is	which is
52	3	trigger	TRIGA
52	20	licensing --	licensing department.
52	24	to --	to the Vice President.
53	23	now	know
55	18	generator and specificall- ly they	generator and reactor vessel materials. Specifically there
55	19	been, and I use the	had problems in
55	20	context of a problem	
55	21	In the Westinghouse Westinghouse combustion	In Westinghouse and Combustion

Subscribed and sworn to
before me this 3rd day
of August, 1979

William S. Curran
Notary Public

Jeffrey Fritzen
Jeffrey Fritzen

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

Corrections to July 19, 1979, Deposition of Jeffrey Fritzen

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
56	14	liability	reliability
59	7	reviewing plants	reviewing only TMI plant items.
59	9	Three Mile Island	Three Mile Island
		--	under the scope of
59	10	Committee, agreed to go	Committee.
		back and	
59	11	review, but I don't recall	I don't recall it
		that.	
59	25	we knew it	they knew it
60	15	a little further	a little more involved than
		that what it was	just the holder tube issue
61	7	faulty -- what do we	utilitites
61	8	facilities	utilitites from

Jeffrey Fritzen
Jeffrey Fritzen

Subscribed and sworn to

before me this 3rd day

of AUGUST, 1979

William L. Lawrence Jr.
Notary Public

NOTARY PUBLIC

Wilmington, Delaware County, Pa.

My Commission Expires December 14, 1982

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

Corrections to July 19, 1979, Deposition of Jeffrey Fritzen

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
61	9	through this	in a once through
61	10	case, because	case did not start because
61	11	here or because	started because
61	13	those problems -- Most	those problems. Most
62	6	that they are	that they are not
63	11	plant --	plant staff
63	12	it -- to information that B&W	it precisely but to information that only B&W
65	7	technical --	technical question that
65	8	the technical question, I	, I
65	21	that needed to	that are needed to

Subscribed and sworn to

before me this 3RD day

of August, 1979

Victor S. Lawrence, Jr.
Notary Public

Jeffrey Fritzen
Jeffrey Fritzen

NOTARY PUBLIC

Muhlenberg Twp., Berks County, Pa.

My Commission Expires December 14, 1982

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

Corrections to July 19, 1979, Deposition of Jeffrey Fritzen

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
66	2	Sher	Clear
66	7	Usually	Normally
66	14	I have contact with him, you know	I have had contact with him in the past.
66	19	to, you know -- it	to expedite an item. It
68	15	today	that day
69	8	the same way --	the same way. In the balance of plant in particular
69	11	because that is what all the B&W analysis is	because most of the B&W analysis is
69	12	based on is generic	generic.

Subscribed and sworn to
before me this 3rd day
of AUGUST, 1979

Walter S. Cussler, Jr.
Notary Public

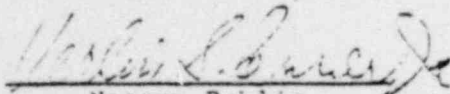
Jeffrey Fritzen
Jeffrey Fritzen

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

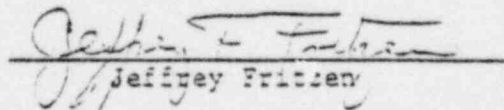
Corrections to July 19, 1979, Deposition of Jeffrey Fritzen

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
69	13	make that, to say	say
69	14	do, once	do, especially once
69	17	Do you	Did you
70	19	do it --	do it but normally it is
71	7	required --	required analysis of equipment
71	11	and prevention of that,	of supply, it
		it	
71	16	didn't	did
72	7	Maybe it is	Maybe if it were
72	7	items	also methods
72	15	hae	have
72	16	bid the design	did the original design.

Subscribed and sworn to
before me this 3rd day
of AUGUST, 1979


Notary Public

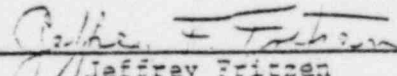
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My Commission Expires December 14, 1982


Jeffrey Fritzen

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

Corrections to July 19, 1979, Deposition of Jeffrey Fritzen

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
76	4	Department	Department identified the problem to us but
76	16	speaking --	speaking for Unit 1.
76	17	they did --	they did for Unit 2.
77	4	solid --	solid at Davis Besse
77	9	to --	to the Davis Besse incident
77	18	was --	only made available to us after the TMI-2 incident.
77	20	when it was issued	exactly when it was issued.
79	14	it anything	it contains anything
82	15	support anchor seal	supports



Jeffrey Fritzen

Subscribed and sworn to

before me this 3rd day

of AUGUST, 1979



Notary Public

NOTARY PUBLIC

Waukegan, Ill., Cook County, Ill.

My Commission Expires December 14, 1982

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

Corrections to July 19, 1979, Deposition of Jeffrey Fritzen

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
83	14	other people -- people	other people on our staff did attend such a meeting. GPU people
83	17	where they were, but	and where they were. But
84	2	that --	that required my attendance.
84	10	were -- these	were ongoing. These

Subscribed and sworn to
before me this 3rd day
of AUGUST, 1979

Verlin S. [Signature]
Notary Public

[Signature]
Jeffrey Fritzen