

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

- - - - - x

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

Plaintiffs, :

-against-

80 Civ.1683(R.O)

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

Defendants. " :
- - - - - x

Deposition of Plaintiff GENERAL PUBLIC
UTILITIES, by ANDRE J. DOMINGUEZ, taken by
Defendant, pursuant to subpoena, at the offices
of Davis Polk & Wardell, Esqs., One Chase
Manhattan Plaza, New York, New York on Tuesday,
August 17, 1982 at 9:20 a.m., before Nancy A.
Rudolph, a Shorthand Reporter and Notary Public
within and for the State of New York.

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PDR ADOCK 05000289
T PDR



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369 LEXINGTON AVENUE
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A p p e a r a n c e s :

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BY: ANN McDONALD, ESQ.,

of Counsel

Also Present:

EDWARD HILL

-oOo-

IT IS HEREBY STIPULATED AND AGREED by
and among the attorneys for the respective
parties hereto that the sealing, filing and

certification of the transcript of the within deposition be, and the same hereby are waived; that said transcript may be signed before any Notary Public with the same force and effect as if signed before the Court; and that all objections except as to the form of the question, are reserved to the time of trial of this action.

-oOo-

A N D R E J. D O M I N G U E Z, having
been first duly sworn by a Notary Public,
testified as follows:

EXAMINATION BY MS. McDONALD:

Q Please state your name for the record.

A Andre J. Dominguez.

Q Where do you live?

A 254 West Fourth Street, Bloomsburg,
Pennsylvania 17815.

Q Mr. Dominguez, you are appearing here

1

2

today pursuant to subpoena, is that correct?

3

A That's correct.

4

Q And you are represented by Mr. Glassman of
Kaye, Scholer?

6

A Correct.

7

MS. McDONALD: I would like to mark as

8

B&W Exhibit 908 the resume of Mr. Dominguez.

9

(Document consisting of one-page resume

10

of Andre J. Dominguez, was marked B&W Exhibit

11

908 for identification.)

12

Q Mr. Dominguez, is this a resume you

13

prepared in order to come to this deposition?

14

A Yes.

15

Q Is it an accurate and complete resume of

16

your job and education history?

17

A Yes.

18

Q I see you went to Pennsylvania State

19

University. What did you study there, what was your
major?

20

21

A Bachelor of science, mechanical

22

engineering.

23

Q Did you take any physics courses while at

24

Pennsylvania State?

25

A Yes.

1

2

Q How long did those courses or that course last?

3

4

A I took a total of five physics courses. Each course lasted approximately three months.

5

6

Q Did you take any course specifically directed at nuclear physics?

7

8

A No.

9

Q Did you take any course which included as part of what you were being taught some nuclear physics?

11

12

A Yes.

13

Q What was the name of that course, if you can recall?

14

15

A I don't recall the name.

16

Q Did you learn in that course about how a pressurized water reactor works generally?

17

18

A No.

19

Q When was the first time you were told anything about how a pressurized water reactor works?

20

21

A In 1966.

22

Q And that was while you were in the Navy?

23

A When I was in the Navy, yes.

24

Q While you were at Penn State did any of your training include discussions of thermodynamics?

25

1

2

A Yes.

3

Q Did you learn about -- generally about --

4

concepts of heat transfer and fluid flow?

5

A Yes.

6

Q Did you learn that the boiling point of

7

water rises as pressure is applied to water?

8

A Just a minute. Yes.

9

Q And you learned that while you were at

10

Penn State?

11

A Correct.

12

Q Or before that?

13

A Both places.

14

Q You learned that also in high school, I

15

take it?

16

A I don't recall.

17

Q Have you taken any courses since being

18

at Penn State of any sort?

19

A No.

20

Q Other than at your various jobs, I take

21

it?

22

A That's correct.

23

Q Did you learn about a concept called

24

"saturation" as it relates to water and steam while

25

you were at Penn State?

1

2

A Yes.

3

Q What did you learn at Penn State on that

4

subject that you can recall?

5

A Basically that while in the saturated

6

condition, temperature and pressure are dependent

7

upon each other.

8

Q What do you mean by that, "dependent upon

9

each other"?

10

A While in the saturation state the

11

temperature will be constant for a particular pressure.

12

The opposite is also true.

13

Q You went into the Navy in 1965, did you

14

have any training there?

15

A Yes.

16

Q What was the first position that you held

17

in the Navy?

18

A I was a naval recruit, E-1.

19

Q What were your job responsibilities when

20

you first went into the Navy?

21

A I didn't have any.

22

Q Were you being trained?

23

A That's correct.

24

Q What training did you receive?

25

A In that position I went to basic training,

boot camp, and after we graduated from boot camp we went on to the next rank.

Q In the course of your approximately six years in the Navy, you I take it held various positions?

A That's correct.

Q Can you give me the highlights?

A Yes.

MR. GLASSMAN: Would you just like the names of the positions or some more detail?

MS. McDONALD: As we go through the names of the positions, I would like to know what that job entailed.

A The best way to describe this would be that for the first two-and-a-half years in service I underwent training. At that point I then held the position of a machinest mate. A machinest mate is one responsible to maintain mechanical equipment. I also was an engineering laboratory technician, the ELT as they call it. I was responsible for the health physics, chemistry portions of the nuclear power plant.

As a machinest mate I was also a mechanical operator on a nuclear plant trained, and he does basically the same things that a machinest mate on a

1
2 fossil plant would do, and that being maintaining the
3 mechanical equipment, running, repairing, et cetera.

4 Q What nuclear plant was that?

5 A It was the USS GREENLAND submarine.

6 Q Was that the only nuclear ship that you
7 served on?

8 A That's correct.

9 Q Mr. Dominguez, were you ever involved
10 while in the Navy in the operation of the primary
11 system of a nuclear reactor?

12 A No.

13 Q Did you receive any training while in the
14 Navy with regard to how a nuclear reactor works?

15 A Yes.

16 Q You mentioned that for the first two-and-a
17 half years approximately you were in training.

18 Can you describe what kinds of courses you
19 had with relation to nuclear reactors? I don't want
20 to hear about boot camp, but tell me about the nuclear
21 courses that you had in the Navy.

22 A Okay, from what I can recall, we were
23 instructed as to the basic operation of the S5W type
24 submarine which is a pressurized water reactor system.

25 We also received training concerning

1

2

radiation. Basic thermodynamic principles, basic nuclear physics, mathematics, chemistry. That's all I can recall.

4

5

Q In the course of learning about

6

thermodynamic principles, did you learn about heat transfer and fluid flow in a pressurized water reactor?

8

9

A I cannot recall the specifics, but heat transfer and fluid flow are things that I can recall the terms being used during those periods of time.

10

11

12

Q Were you trained in the Navy that the

13

water in a pressurized water reactor is on occasion

14

maintained at a temperature substantially higher than 212 degrees Fahrenheit?

15

16

A Yes.

17

Q Were you taught why it was that that water didn't boil?

18

19

A The water in a pressurizer always boiled.

20

Q I am referring to the water in the

21

reactor coolant system other than in the steam space in the pressurizer.

22

23

A If I understand the question correctly,

24

you are asking why didn't the water in the reactor

25

coolant system itself boil?

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Q What I think we can all agree to is the atomospheric boiling temperature of water?

A Yes, they explained that to us.

Q What did they say?

A The reason why the water would not boil in the reactor coolant system is because the pressure was maintained above the saturation temperature of that water.

Q How were you taught that that pressure was maintained?

A With the pressurizer.

Q Were you taught that it was necessary to keep a steam bubble at the top of the pressurizer in order for it to fulfill its function of keeping the steam pressurized?

A Yes.

Q Based on your training in the Navy, was it possible to control pressure in a pressurized water reactor with no bubble at the top of the pressurizer?

MR. GLASSMAN: Perhaps I don't understand the question, but that seems to be the same as the last question you asked.

MS. McDONALD: Let me explain.

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Q What I mean by "control" is raise the pressure or lower it in a planned way without a bubble at the top of the pressurizer.

MR. GLASSMAN: I have the same objection.

I think it's the same question. The witness can try again if he wants to.

A Yes, I would like to clarify.

Pressure can be raised and lowered in a controlled fashion without a bubble during other than normal operating periods. During operating periods the method that we utilized and were instructed was to control the pressure in the primary was the pressurizer.

Q When you refer to raising or lowering pressure with no bubble in the pressurizer, could you explain what you were referring to?

A Yes. You can raise the pressure in the primary system if it is solid, that being the pressurizer is also full of water, by increasing the pressure with high pressure pumps.

Once you raise the pressure utilizing that kind of method, you can also lower it by draining the water off.

Q Did you learn in the Navy about what I

1
2 will call solid system operation of a pressurized
3 water reactor?

4 A Not that I can recall.

5 Q When you were in the Navy, did you ever
6 see a solid system and by solid I mean completely
7 full of water, the whole RCS including the pressurizer
8 completely full of water?

9 A I don't recall ever seeing that situation.

10 Q Based on your training in the Navy, if
11 you had a solid system, the whole RCS and the
12 pressurizer full of water and you turned on the high
13 pressure pumps as you just described them and started
14 pushing water into the system, would you expect a
15 rapid rise in pressure?

16 A Yes.

17 Q After you left the Navy, you went to
18 Metropolitan Edison, is that right?

19 A No, I went to Penn State.

20 Q You went back to Penn State? I'm sorry, I
21 misunderstood you before.

22 A No, I went to Penn State after I left the
23 Navy.

24 MS. McDONALD: Off the record.

25 (Discussion off the record.)

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Q You went to Metropolitan Edison in 1975, is that right, Mr. Dominguez?

A That's correct.

Q And from 1975 through some point in 1976, you were an engineer level 1, is that correct?

A Correct.

Q What were the responsibilities of engineer level 1?

A I would like to talk about my responsibilities.

Q That's what I would like to know about.

A The primary job that I had during that period of time was a scheduler, and I worked on the scheduling of the two major outages of Three Mile Island.

Q Refueling outages?

A One was a reactor coolant pump seal outage, the other was the first refueling outage.

Q During your first year at Metropolitan Edison, did you receive any training?

A Yes.

Q And what training was that?

A I received a systems course. I believe that was the extent of that first year. It was a

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systems course.

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Q After that year did you receive further training at Metropolitan Edison?

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A We are talking from the period of time from '76 to '78?

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Q Why don't we just do it this way: Why don't you describe to me after the systems course what further training did you have at Metropolitan Edison until you left Metropolitan Edison?

A The other training which I received was a, we will call it a TMI-2 systems course which was given in preparation of being a shift test engineer.

Q How long did that training last or was it ongoing or what?

A Approximately three months, two hours a day.

Q Do you remember anything you learned in that course?

A Yes.

Q Were you told anything about thermodynamics?

A I don't recall addressing thermodynamics in the courses.

Q Once you became a shift test engineer,

1

2

did periodic on-the-job training go on?

3

A No.

4

Q Do you remember any of the people that

5

taught this course on TMI-2 systems?

6

A Yes.

7

Q Can you name the ones that you recall?

8

A Myself, Craig McMullin, John Ulrich,

9

Jack Garrison.

10

Q Was there a Mr. Hawkins?

11

A Hawkins.

12

Q What was his position at that time?

13

A Assistant test superintendent.

14

Q All of these people were GPU or

15

Metropolitan Edison employees, is that correct, the

16

people you have named?

17

A Yes, that's correct.

18

Q Did you know a person named Nelson?

19

A Max Nelson, yes.

20

Q What was his position?

21

A I don't know what his position was.

22

Q Do you know who he was employed by?

23

A General Public Utilities.

24

Q Did you learn anything in this course

25

about procedures?

1

2

A I don't recall that specific topic.

3

4

Q Did you learn anything about how a
pressurized water reactor works generally?

5

A Generally, yes.

6

7

Q Did you learn about how pressurizer,
learn more, I guess I should say in your case, about
how the pressurizer works?

8

9

A Yes.

10

11

Q Did you recall anything that you were
told about how the pressurizer works in a pressurized
water reactor?

12

13

14

A I can't specifically recall the things
that were instructed to us at that time.

15

Q Did you know a fellow named M.J. Perry?

16

A I don't recall the name.

17

Q How about Carl Gatto?

18

A Yes.

19

Q Who is Mr. Gatto?

20

A Mr. Gatto was a startup test engineer.

21

Q At GPU?

22

A He was an employee of GPU.

23

Q R.R. Lentz?

24

25

A Yes, I recall the name. He was an I&C
expert, that being instrumentation and control. I

1

2 believe he was also employed by GPU.

3 Q Steve Poje?

4 A Yes, I recall Steve. He was also a
5 startup test engineer.

6 MR. GLASSMAN: Can we take a short break?

7 MS. McDONALD: What is the purpose of
8 this?

9 MR. GLASSMAN: I would like a one-minute
10 break.

11 MS. McDONALD: To coach your witness,
12 Mr. Glassman? This is ridiculous, Mr. Glassman.
13 You just walk out of the room!

14 (Recess taken.)

15 Q Mr. Dominguez, prior to coming to this
16 deposition were you asked to look for documents which
17 might relate to this case?

18 A Yes.

19 Q Did you do so?

20 A Yes, I did.

21 Q And did you turn over to your lawyers
22 everything that you found?

23 A Yes.

24 Q Several notebooks have been produced to
25 us by Kaye, Scholer, Mr. Dominguez' attorneys. There

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are four notebooks. I wonder, Mr. Dominguez, if you
can identify those for us as documents that you
turned over?

4

5

A Yes, these are the documents I turned over.

6

Q Did you turn over any other documents?

7

A Yes, I turned over an entry in my personal
log that discussed a very brief conversation with an
NRC person.

9

10

MS. McDONALD: Mr. Glassman, I specifically

11

requested any notes that Mr. Dominguez had of

12

conversations with the NRC. I asked

13

Mr. Eickemeyer for those things last week, and

14

he tried to produce them, and I do not have

15

them and I specifically said to him I will ask

16

Mr. Dominguez this.

17

It will certainly save time if you produce

18

them and we can call Mr. Eickemeyer right now.

19

He specifically agreed to this.

20

MR. GLASSMAN: Ms. McDonald, perhaps,

21

there has been a problem with the mails or

22

something of that sort. I am familiar with

23

the file, and I had understood that

24

Mr. Eickemeyer or someone else from our office

25

was forwarding it to you. I can make a call,

1
2 but if not I happen to have a copy of that
3 document anyway and would be more than happy
4 to produce it for you here now.

5 MS. McDONALD: But you are not objecting
6 to its production?

7 MR. GLASSMAN: No, as is our policy, when
8 you make a specific request for a document if
9 we can locate it we will produce it and we will
10 be glad to do so here as well.

11 MS. McDONALD: Well, I would appreciate
12 its production. Thank you.

13 MR. GLASSMAN: Off the record.

14 (Discussion off the record.)

15 MR. GLASSMAN: Although I believe that
16 this has been produced, so as to avoid any
17 misunderstanding we herewith produce a copy
18 again.

19 MS. McDONALD: Mr. Glassman, I am sure
20 you intended to produce it. I am sure it was
21 not produced, but I thank you for producing it
22 now.

23 BY MS. McDONALD:

24 Q Mr. Dominguez, what are those documents,
25 generally?

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A They are lectures that were prepared by the people who taught the TMI-2 systems courses.

Q Did you turn over anything other than those documents and the personal log entry that we just discussed?

A No.

Q In the course of this systems course, did you have any training in transient response?

A Not that I can recall.

Q Were you ever asked to review any operating emergency procedures for either TMI-1 or TMI-2?

A I don't recall ever being requested to do that.

Q You said that you taught some part of this course. Can you remember what you taught?

A Yes.

Q What was that?

A The types of lectures which I prepared and taught were concerning support systems to the plant, some examples would be Ammertap.

Q What is Ammertap?

A Do you want this on or off?

Q I have no idea what they are. Just describe them generally.

1
2 A The Ammertap system is a water cleaning
3 system. They inject tiny little sponge balls into
4 the circulating water system. They pass through the
5 tubes and scrub the tubes as they pass through. We
6 collect the balls at the end and recirculate them
7 into it.

8 Q Did you ever teach anything about the
9 condensate polishers? You know what I am referring to?

10 A Yes. I don't recall.

11 Q Have you ever received any licenses, by
12 that I mean control room operator or senior reactor
13 operator licenses?

14 A No.

15 Q From 1976 to 1978 while employed by
16 Metropolitan Edison you were a shift test engineer at
17 TMI-2, is that correct?

18 A Yes.

19 Q Did Metropolitan Edison run the startup
20 and test program at TMI-2?

21 A No.

22 Q Was that run by GPUSC or GPU?

23 A Yes.

24 MR. GLASSMAN: You are asking this witness
25 either or, the question unclear.

1

2

Q Who did run it?

3

A GPU.

4

Q Did Metropolitan Edison loan GPU personnel
to assist with the startup and test program?

6

A Yes.

7

Q How did that come about?

8

MR. GLASSMAN: Are you asking for this
witness' knowledge of how other people reached
such a decision or are you asking him what he
was told?

12

13

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15

16

MS. McDONALD: I am asking what he knows
about why Met Ed personnel were working for
startup and test from whatever sources he knows
it. Obviously, if he knows it he must have been
told it.

17

18

MR. GLASSMAN: Are you now asking
generally or of Mr. Dominguez?

19

20

21

MS. McDONALD: Generally. You are looking
for his knowledge, you are not asking him to
guess?

22

23

MS. McDONALD: No, I don't want him to
guess. I just want to know if he knows.

24

25

A I don't know what was involved into the
actual decision to have that come about.

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Q When in 1978 did you leave Metropolitan Edison and go to Pennsylvania Power & Light Company?

A Approximately September.

Q And your position at Pennsylvania Power & Light beginning in 1978 and up to the present day is power production engineer, is that correct?

A Not completely. In 1978 I had the position of power production engineer and I have been promoted to the position of senior project engineer.

Q What does a senior project engineer do, what do you do as a senior project engineer?

A I am responsible to resolve problems that arise in the residual heat removal system and I manage 16 engineers.

Q The Susquehanna Steam Electric Station, what kind of plant is that, it's not a nuclear plant is it?

A Yes, it is a nuclear plant.

Q What kind of a nuclear plant?

A It is a boiling water reactor.

Q Do you recall being trained at Metropolitan Edison as to what the normal operating level of the pressurizer was?

A I recall that there was a normal operating

1
2 level in a band to operate between.

3 Q Do you recall that that level was
4 approximately 220 inches?

5 A No.

6 Q Do you recall that it was 400 inches?
7 It was less than 400 inches,
8 wasn't it?

9 A It was less than 1000, it was greater than
10 zero. I don't recall.

11 Q Do you recall how many inches the
12 pressurizer level could have an indication in TMI-2?

13 A No, I don't recall.

14 Q Do you recall in any of your training up
15 to the time you left Metropolitan Edison, and by
16 that I am including the Navy and Penn State and all
17 your training, hearing of the concept of flashing as
18 it relates to water and steam?

19 A Could you rephrase that. I'm sorry. I
20 don't need a rephrasing. The question again, did
21 I recall being --

22 MR. GLASSMAN: Could we have the question
23 reread?

24 (Question read.)

25 MR. GLASSMAN: I am going to note an

objection as to form.

THE WITNESS: Would you reread the question again?

MS. McDONALD: Why don't I ask it again.

THE WITNESS: No, I can answer the question.

Q Up to the time you left Metropolitan Edison, have you ever heard of the term flashing?

A Yes.

Q What did it mean to you?

A Flashing to me means turning liquid into vapor.

Q Up to the time you left Metropolitan Edison, have you ever heard that flashing could occur in the primary system of a pressurized water reactor in a place other than the pressurizer?

THE WITNESS: Could you reread that, please?

(Question read.)

A I don't recall.

Q Since the Three Mile Island accident, have you ever testified under oath apart from today?

A No.

Q Have you ever been interviewed by

1
2 anyone in connection with the Three Mile Island
3 accident?

4 MR. GLASSMAN: Are you talking about
5 apart from conversations with counsel?

6 MS. McDONALD: Oh, yes, apart from
7 conversations with counsel.

8 A No.

9 Q After the Three Mile Island accident were
10 you ever interviewed by anyone relating to anything
11 at Three Mile Island?

12 A No.

13 Q Have you ever heard of a Mr. John Craig
14 of the NRC?

15 MR. GLASSMAN: Are you asking up until
16 today?

17 MS. McDONALD: Yes.

18 MR. GLASSMAN: Obviously counsel is
19 reading from a document which we just turned
20 over, a particular note there.

21 MS. McDONALD: Well, obviously
22 Mr. Dominguez knows about his interview with the
23 NRC, and I am trying to figure out what game
24 is being played here.

25 MR. GLASSMAN: Let me interrupt,

1
2 Ms. McDonald, I thought you were going to try to
3 express some question here. I think
4 Mr. Dominguez told you a little earlier that he
5 did receive a phone call from someone at the
6 NRC.

7 We have just produced another copy of this
8 document a few moments ago. Perhaps you could
9 clarify this by asking him whether that was an
10 interview.

11 BY MS. McDONALD:

12 Q I would like to know why you have excluded
13 an interview that you apparently had on the phone with
14 the NRC from your answers to the last two questions?

15 MR. GLASSMAN: Objection. There has been
16 no basis established that there was an interview.
17 I mean, if you would like to ask him whether he
18 had an interview --

19 MS. McDONALD: Let's mark as B&W 909, the
20 document that has just been produced which
21 Mr. Glassman so desperately wants to put before
22 the witness.

23 MR. GLASSMAN: It's up to you. I think
24 we are wasting time. You are getting into a
25 semantics game. It's obviously a document that

1
2 you are placing before the witness which begins,
3 "Received a call from John Craig (NRC)." And
4 you can ask the witness any questions you want,
5 but I hope we don't get caught up in a semantics
6 game.

7 MS. McDONALD: It is not I who is being
8 caught up in a semantics game.

9 MR. GLASSMAN: You can ask any questions
10 you like.

11 MS. McDONALD: Can we mark that document
12 as B&W Exhibit 909.

13 (One-page handwritten document marked
14 B&W Exhibit 909 for identification.)

15 BY MS. McDONALD:

16 Q Mr. Dominguez, can you identify B&W
17 Exhibit 909 for me?

18 A Yes, that's a copy from my personal log.

19 Q Do you regularly keep a personal log?

20 A No, I do not.

21 Q Why were you keeping this particular
22 personal log?

23 A I have a logbook that I record bits of
24 information that come across my desk that I would like
25 to recall. It's not a regular thing.

1

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Q How long have you been doing this?

3

A Approximately nine months.

4

5

Q What kinds of events or things that come across your desk do you tend to write down in your personal log?

6

7

A Things which I believe will be of value to me in the future.

8

9

Q Mr. Dominguez, do you see the entry opposite 5/21/81?

10

11

A Yes.

12

Q That is your handwriting?

13

A Yes, it is.

14

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Q Is everything on this page your handwriting other than the typed portion at the top that says "Notes: Andre' J. Dominguez"?

16

17

A Everything on this page is by my hand.

18

19

Q Do you recall receiving a call from Mr. John Craig of the NRC on or about May 21, 1981?

20

A Yes, I do.

21

22

Q Did Mr. Craig tell you why he was calling you?

23

A Yes, he did.

24

Q What did he say?

25

A He said he was interested in a log entry

I had made in a shift test engineer's log concerning an event which had occurred on September 1977.

Q Did you respond to his inquiry?

A Yes, I was very congenial.

Q When you were on the phone with him, did you pull out your personal logbook and take notes?

A No, I did not.

Q Did you, subsequent to the phone calls, take some notes regarding what had transpired to the conversation?

A Subsequent to the conversation I made this entry into the logbook.

Q By "this entry" you mean the one on B&W 909?

A That's correct.

Q How long after the phone call did you make this entry?

A Approximately three hours.

Q At the time you made this entry, did you have a clear recollection of what had transpired in the conversation at the time you wrote this, three hours later?

A Yes, I did.

Q Did you write down anything in this log

1
2 entry that was false; in other words, that had not
3 transpired in the phone conversation?

4 A The things that are entered into this log
5 outside of the quotes, that being "formation of a steam
6 bubble in the loops" are my words and they're
7 interpretation of the phone conversation.

8 Q Do you have a present recollection of
9 what transpired in the phone conversation?

10 A I do not have a complete recollection of
11 it, but I do have a recollection of it.

12 Q Do you recall that Mr. Craig asked you
13 about an entry in the shift test engineers log for
14 September 1977 concerning formation of a steam bubble
15 in the loops?

16 A Yes, I do.

17 Q And did you tell him in words or substance,
18 and I am reading now from the document, "that steam
19 bubble was not the most appropriate word, but rather
20 a vapor bubble of very low quality was specifically
21 what had formed due to the cooling down of the loops"?

22 A Would you read that back, please.

23 (Question read.)

24 A Yes.

25 Q Did Mr. Craig tell you why he was

1
2 interested in finding out about this event?

3 A He indicated that it was due to a review
4 that the NRC had made in relation to the Three Mile
5 Island accident.

6 Q Did he tell you or did you just know
7 what possible connection a steam bubble in the loops
8 could have to the Three Mile Island accident?

9 I will ask it in two questions: Did he
10 tell you?

11 A Yes, he did.

12 Q What did he say?

13 A He indicated that the particular word,
14 that being "steam bubble formed in the loops,"
15 resembled something which had occurred during the
16 accident and he thought there was a connection there.

17 Q At the time you had this conversation,
18 did you know anything about the Three Mile Island
19 accident yourself?

20 MR. GLASSMAN: Are you talking about did
21 he have actual knowledge or did he hear
22 something?

23 MS. McDONALD: Did he know anything from
24 whatever source he might have known it, whether
25 he was told it or he knew it.

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A Yes.

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Q What did you know about the Three Mile Island accident?

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MR. GLASSMAN: I object to the use of the word "know" because there is no testimony that people conducted an investigation.

8

9

MS. McDONALD: I would like to know his state of mind.

10

11

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MR. GLASSMAN: That's fair.

THE WITNESS: Could you define "state of

mind"?

13

14

Q What did you know or think you knew about the Three Mile Island accident?

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A I made it a habit not to know very much of what occurred there because there was such a proliferation of documents that came out. I basically knew the sequence of events.

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Q And prior to the time you talked to Mr. Craig, did you know that in the course of the Three Mile Island accident voiding had occurred in the primary system and resulted in formation of steam bubbles in the primary system other than in the pressurizer?

A No, I didn't know that.

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Q Mr. Dominguez, what were your duties and responsibilities as a shift test engineer in TMI-2?

A Our duties and responsibilities were to conduct the pre-operational testing of Three Mile Island Unit 2 and they were pretty much limited to that.

Q In the course of your duties as a shift test engineer, were you required to fill out any kind of logs?

A Yes, I was.

Q What logs were those?

A The shift test engineers log.

Q What was the purpose of the shift test engineers log?

A The shift test engineers log supplied a list of all the testing that we had performed. It also documented or reviews what the shift test engineers did prior to conducting tests, and we also used it to put pieces of information that would be of value to both ourselves, the shift test engineers and our supervisors.

Q Was there a procedure for filling out the shift test engineers logs?

A I don't recall the procedure.

1

2 Q Did you receive any training?

3 A Yes, we did.

4 Q On how to fill out the log?

5 A Yes, we did.

6 Q Do you remember who that was from?

7 A That was from Mr. Toole.

8 Q What was Mr. Toole's position?

9 A It was the startup and test superintendent.

10 Q Was it part of your responsibility to
11 fill out this log as accurately as you could, based
12 on your knowledge when you were filling it out?

13 A Yes, correct.

14 Q When specific tests were being run, was
15 it the practice in filling out this log to write down
16 the number of the test procedure in the margin of the
17 log?

18 A Yes.

19 Q Prior to assuming your position as shift
20 test engineer, was it your practice to review the
21 prior log entries back until your last entry?

22 A Yes, it was.

23 Q Was that required by the procedure for
24 filling out the log?

25 A I am not familiar with the procedure.

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Q Was it told to you in your training that that is something that you should do?

A I believe it was.

Q Was it your practice to consult with the shift test engineers who had the shift before you came on as to what the condition of the plant was, and what tests had been conducted during your shift?

A Yes, it was.

Q Did you also on occasion consult with control room operators?

On occasion, yes.

Q And shift foreman?

A Yes.

Q And shift supervisors?

A Yes.

Q Did you generally make yourself aware of the condition that the plant was in when you came on shift?

A Yes.

Q Do you know whether Mr. Toole made it a practice to review the log periodically?

A Mr. Toole reviewed the log.

Q And on occasion did you see in that log entries by Mr. Toole indicating that he had reviewed

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it, and then he would on occasion make certain
comments?

A Yes.

Q Did you ever record anything in the shift
test engineers log that at the time you were recording
it you knew to be false?

A No.

Q Do you know of anyone else who did that?

A No.

Q Even if a test, a specific test, was not
in progress during one of your shifts, would you
nevertheless make entries into the log, the shift
test engineers log?

A That's correct, yes.

Q And was it your practice to record any
unusual events or parameters that came to your
attention in the log?

A It was not our habit to record any
unusual parameter.

Q Was it your habit to record some unusual
parameters?

A Yes.

Q Such as?

A Those deemed significant at the time.

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Q Let me just show you what's already been marked as B&W Exhibit 173, and I am just going to ask you if you have ever seen that document before.

The document is entitled "Test Instructions Number 17 Shift Test Engineers Log, Prepared by J.P. Miller."

A Would you re-read that, please.

(Question read.)

A I don't recall ever having seen this.

Q While you were a shift test engineer, were you familiar with something called an Unusual Occurrence or Events Report?

A No, I wasn't.

Q While you were a shift test engineer, were you aware of any regulations or laws requiring that GPU or Met Ed report anything that came to their attention which might endanger the public health and safety?

A There is such a law. I am aware of it.

Q Were you aware of it while you were a shift test engineer?

A Yes.

Q While you were a shift test engineer, were you told that you had any responsibility for

1
2 bringing to your superior's attention things that
3 might endanger the public health and safety?

4 A Yes.

5 Q Was it your understanding when you were a
6 shift test engineer that certain things had to be
7 reported to the NRC, certain significant or unusual
8 events?

9 A No.

10 Q No one ever told you that while you were
11 at Met Ed?

12 A I don't recall ever being instructed as to
13 the requirement or necessity to report specific types
14 of unusual events to the NRC.

15 (Recess taken.)

16 Q Could you tell me, Mr. Dominguez, what you
17 remember today about what went on during the incident
18 that is referred to in B&W 909?

19 MR. GLASSMAN: Are you talking about the
20 entire incident or a particular aspect described
21 on this document?

22 MS. McDONALD: The entire incident.

23 A Foremost in my mind was that there was a
24 resin migration into the nuclear services closed
25 cooling water system which forced all the pumps to

1

2 trip off after a period of time. That system cools
3 the reactor coolant pumps and subsequently they had to
4 be turned off to prevent damage to them..

5 Q Do you remember anything else about the
6 event?

7 A It is not clear in my mind what we did
8 directly after that. The only other thing that
9 really sticks out in my mind was the fact that there
10 was a lengthy investigation as to the extent of the
11 resin problem.

12 Q Did this event continue for a few days?

13 A As I recall it did.

14 Q Do you recall that in the course of the
15 event a vapor bubble of some kind was formed somewhere
16 in the reactor coolant system other than in the
17 pressurizer?

18 A I don't recall that.

19 Q Referring to B&W 909, you testified before
20 that you told Mr. Craig of the NRC that a vapor
21 bubble of very low quality was specifically what had
22 formed due to the cooling down of the loops.

23 When you told him that, did you have a
24 recollection of that or were you lying to him?

25 A As it relates to the incident in 1977,

1
2 September, I didn't recall formation of a steam
3 bubble. What Mr. Craig had done here is to read
4 something which he indicated I had written. I don't
5 recall ever having written that. I don't know if
6 I ever did write it. Under the assumption that
7 perhaps I had written it, I felt that the choice of
8 words "steam bubble" was inappropriate, but rather
9 that specifically if you had some kind of voiding
10 occurring in the loop, it would be a vapor bubble
11 of very low quality. They use thermodynamic terms
12 in here to describe it to Mr. Craig.

13 The conversation between myself and
14 Mr. Craig was at best a big guessing game. He caught
15 me completely off guard. I had no documents in front
16 of me, and I explained to Mr. Craig that everything
17 would have to be off the record because I really
18 wasn't sure what he was talking about.

19 Q And at the time of your conversation with
20 Mr. Craig, as you testified before, you didn't know
21 what had happened really at Three Mile Island, is
22 that right?

23 A That's correct.

24 Q So without knowing anything, very little,
25 anyway about what had happened at Three Mile Island,

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2

you knew that vapor could be formed in the reactor

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coolant system outside the pressurizer, is that

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correct?

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MR. GLASSMAN: Objection as to form. I

6

think he's answered already.

7

Q Would you just describe what you were

8

trying to tell Mr. Craig, where did you get the

9

understanding that vapor could be formed in the

10

reactor coolant system outside the pressurizer?

11

A Every time that you cool down the loops,

12

depressurize the pressurizer, something forms in the

13

loops, the high points of the system, that is what I

14

call a vapor space, or a vapor bubble.

15

What I had in mind when I was talking to

16

Mr. Craig was when you heat back up again you

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pressurize the pressurizer. You have to force all

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that void space, this vapor bubble out to make sure

19

the loops are filled with water. And that's why I

20

said that specifically what you would have in a

21

situation like that would be a vapor bubble of very

22

little quality because in my mind that's what it would

23

be called as opposed to a steam bubble.

24

Q And I take it that you knew when you were

25

a shift test engineer at Three Mile Island that vapor

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bubbles of very low quality could form in the reactor coolant system outside the pressurizer, is that true?

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MR. GLASSMAN: Objection. The witness has already told you where specifically that might or might not form as to his understanding.

Q And I want to know if you knew what you just told us when you were a shift test engineer at Three Mile Island?

Is that right?

A We knew that when you cooled down and depressurized that between the time that had occurred and you pressurized back up again that the hot legs and the other high points would have vapor in them.

Q Based on your understanding at that time, why would the hot legs get vapor in them?

A Geometry.

Q What do you mean by that?

A The highest points of the system are the hot legs. If you let all the water drain down to some level below that, you are going to create a vapor space up there.

Q Was it your understanding that vapor could form prior to draining?

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A No, I never expected it to occur prior to draining.

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Q So you would have considered that to be unusual, is that right?

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MR. GLASSMAN: You can't ask him to speculate about what he would have considered if he didn't actually consider it.

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A I would have to say I never really considered it.

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Q Based on your knowledge when you were a shift test engineer that you just testified about, did you ever see vapor, experience vapor forming in the reactor coolant system outside the pressurizer to the system being drained of water?

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A I can't recall ever seeing that happen.

Q The cooldown that you have just been describing where vapor sometimes formed was that a normal cooldown that occurred in every cooldown based on your understanding when you were a shift test engineer?

24

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A Yes.

Q Do you know whether the control room

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operators at Three Mile Island knew that?

A No, I don't know.

Q Did you ever have any conversations with control room operators, shift test engineers or shift foreman at Three mile Island regarding this phenomenon during cooldown?

A I don't recall having conversations of that nature.

Q Did any control room operator or shift foreman or shift supervisor ever indicate to you that he knew that vapor could form in the reactor coolant system during normal cooldown?

A I don't recall ever hearing that.

Q How did you come to know that?

A I witnessed it.

Q On how many occasions?

A I can only recall one occasion.

Q When was that?

A I can't recall a specific date or time.

Q Was it during the event which started with the resin migration?

A I can't recall.

Q When I refer to the event which started with the resin migration, you know what event I am

1
2 talking about?

3 A You are talking about the event
4 September 1977?

5 Q Correct. Do you remember anything during
6 that event about behavior of the pressurizer level?

7 A I don't recall anything specifically about
8 the pressurizer level.

9 Q During the normal cooldown that you have
10 been describing in which on occasion vapor may form
11 in the hot legs, was it your understanding that that
12 vapor would cause pressurizer level to rise?

13 A No, it wasn't.

14 Q Was it your understanding that that vapor
15 formation would have any effect on pressurizer level?

16 A No.

17 Q Were you ever taught while at Metropolitan
18 Edison anything about the desirability or
19 undesirability of operating Three Mile Island in the
20 solid state?

21 A I don't recall any training that discussed
22 the operation in a solid state.

23 Q Was it normal based on your experience
24 as a shift test engineer to operate the plant with
25 the pressurizer completely full of water?

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A No.

3

Q Did you ever see that happen?

4

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A I never saw operation of the plant with the pressurizer full of water, no.

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Q Is it correct that the only time you saw the pressurizer full of water was during hydrostatic testing at Three Mile Island?

9

10

MR. GLASSMAN: I think the witness just answered that he never saw it.

11

12

13

MS. McDONALD: He used the word "operation," I thought he might be making some distinction there.

14

THE WITNESS: Yes, I was.

15

16

Q Did you ever see the pressurizer full of water, Mr. Dominguez?

17

18

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A I observed hydrostatic testing of the plant. I don't recall what the condition of the pressurizer was. It has to be full in order to do that.

20

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Q That hydrostatic testing is the only occasion that you remember seeing the pressurizer full of water?

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MR. GLASSMAN: Just so we are clear, the witness just said he doesn't recall actually seeing that.

1
2 Q Do you remember any time other than the
3 obvious time of hydrostatic testing that the
4 pressurizer was full of water?

5 A I don't recall.

6 Q Based on your training and your knowledge
7 while at Metropolitan Edison I want you to think back,
8 would you have considered it unusual to have the
9 pressurizer full of water while the plant was being
10 operated?

11 A Yes, I would consider that unusual.

12 Q Now, Mr. Dominguez, I would like to show
13 you portions of the shift test engineers log and the
14 pages I would like to show you come from what has been
15 previously marked B&W Exhibit 175, and the pages I am
16 going to hand you are pages stamped W06066 through 06080.
17 I would like to ask you if you recognize that as part
18 of a shift test engineers log?

19 A I recognize this as the shift test
20 engineers log.

21 Q Have you reviewed this portion of the
22 shift test engineers log since the Three Mile Island
23 accident other than with counsel?

24 A No, I have not.

25 Q During this time period, namely

1
2 September 1977, up through the time you left
3 Metropolitan Edison, did the shift test engineers
4 have three shifts a day?

5 A Yes.

6 Q They were 8-hour shifts?

7 A Yes.

8 Q Did they go from 11:00 p.m. to 7:00 a.m.
9 and then from 7:00 a.m. to 3:00 p.m., and then from
10 3:00 p.m. to 11:00 p.m. were those shifts, the 8-hour
11 shifts?

12 A Give or take an hour, yes. I don't recall
13 the exact time.

14 Q But there were three 8-hour shifts?

15 A Yes.

16 Q Would you refer to page W06069, please.

17 Do you see the entry that begins at the
18 bottom of the page and is dated September 8, 1977?

19 It starts "Relieved, Jack Garrison."

20 A Yes.

21 Q Can you tell based on your knowledge of
22 how these logs were kept that that is the entry for
23 the first shift on September 8, 1977? I note that the
24 entry previous to that is dated 9/7/77.

25 MR. GLASSMAN: I think we can stipulate

1
2 that that's what it appears to be. Obviously
3 the witness is hard-pressed to recall and say
4 exactly --

5 MS. McDONALD: I am asking for the added
6 knowledge that he might have known how these
7 logs were kept.

8 A The time and day.

9 Q Was it approximately the 11:00 to 7:00
10 shift give or take an hour?

11 A Yes, I would say that was the first entry
12 for September 8th, that being the 11:00 to 7:00 shift.

13 Q Would you turn the page. At the bottom
14 of page 06070, towards the bottom, there is an entry
15 "Opened RCV155 and V137, and started venting the
16 pressurizer to the reactor coolant drain tank."

17 Do you recall that at some point during
18 this event the pressurizer was vented to the reactor
19 coolant drain tank?

20 MR. GLASSMAN: You are asking the witness
21 for a present recollection rather than an
22 interpretation of this document.

23 MS. McDONALD: Or if this log refreshes
24 his recollection.

25 A I don't recall.

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Q Do you recall that there were vent valves on the top of the pressurizer which led to the reactor coolant drain tank?

A I recall that there was at least one, yes.

Q Do you recognize either one of these valve designations as being valves at the top of the pressurizer?

A No, I don't recall those valve designations.

Q When you say you recall at least one, which one was that?

A I recall that the pressurizer had a vent, how many valves were associated with it or how many different vents there actually were, I don't recall.

Q Were these vents at the top of the pressurizer, generally?

A Generally, yes.

Q Would you turn over the page to page 06071. Do you see your handwriting anywhere on that page?

A Yes.

Q Is the entry beginning with "Relieved John Ulrich," is that your entire entry in your handwriting through to the next page where you signed your name?

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A Yes.

3

4

5

Q What do you recall was occurring when you took over this shift, and if this document refreshes your recollection feel free to make use of it.

6

7

MR. GLASSMAN: You want the witness' recollection now?

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A I don't recall exactly where we were at the time of this entry in terms of plant conditions other than what is recorded at the top.

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Q Sort of two-thirds down the page, do you see an entry which says "Pressurizer level unexpectedly increased when venting the pressurizer, and decreased pressure from 500 psig to 460 psig. Pressurizer level increased about 150 inches during this evolution. Pressurizer temperature was about 340 Fahrenheit. Apparently the reference legs have flashed and there was no steam in pressurizer to fill the reference legs. One reference leg is going to be filled to verify the correct level."

21

Do you see that?

22

A Yes, I do.

23

Q That is in your handwriting?

24

A Yes, it is.

25

Q Do you recall that during this event

1
2 pressurizer level increased approximately 150 inches,
3 and that that was unexpected to you?

4 A Yes. I would like to say one other thing.
5 I don't really recall this particular conversation,
6 but I believe it to be correct, that there was an
7 unexpected increase in level.

8 Q Can you recall why you considered it to
9 be unexpected?

10 A Prior to this time I had never entertained
11 the -- this particular situation from occurring so it
12 was unexpected.

13 Q I thought that it's written here that
14 pressurizer level unexpectedly increased. Did you
15 mean unexpectedly by the way?

16 A We didn't expect it.

17 Q This occurred when venting the pressurizer
18 and decreased pressure from 500 to 460 psig. Had you
19 ever before experienced the phenomenon of pressurizer
20 level going up at the same time that pressurizer level
21 was going down?

22 A I don't recall ever having witnessed that
23 prior to this.

24 Q Was it your understanding when you made
25 this entry that opening a valve at the top of the

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pressurizer and venting it would tend to decrease pressure in the reactor coolant system, everything else remaining the same?

A Oh, yes.

Q You wrote apparently the reference legs have flashed and there was no steam in the pressurizer to fill the reference leg.

Can you recall what you meant by that?

A Yes. As we described before, flashing would be that the reference leg liquid had flashed into steam. Since we knew there was no steam in the pressurizer, there would be no way to fill that reference leg back up.

MS. McDONALD: Would you read that answer back.

(Question read.)

Q Fill that reference leg back up with what?

A Liquid.

Q You wrote apparently the reference legs have flashed, what caused you to think-that?

MR. GLASSMAN: Objection. There has been no testimony that was Mr. Dominguez' thought or anyone else's thought at this point.

MS. McDONALD: He wrote that.

1
2 MR. GLASSMAN: There has been no
3 foundation, you haven't asked him whether or
4 not particular notes reflect his thoughts or
5 someone else's thoughts or any or all of the
6 above.

7 There is no foundation.

8 Q I just want to know why you wrote
9 apparently the reference legs flashed?

10 A The word "apparently" was used because
11 apparently there was no proof, if you will, that that
12 was the actual cause of the observed phenomena.

13 Q Did you write that because you suspected
14 that that might be one cause?

15 A To me that seemed the most logical
16 explanation for what had occurred.

17 Q So as far as you recollect, you wrote this
18 based on a conclusion that you thought might be
19 possible rather than someone else telling you this?

20 A I cannot recall if this is my own
21 original thought. It wouldn't be unusual to have
22 discussed it prior to coming to that conclusion.

23 Q While you were on this shift, do you
24 recall having any conversations with any of the
25 control room operators or shift foreman or shift

1 supervisor who was in the control room?

2 A I don't recall having conversations with
3 them.
4

5 Q Based on your understanding at the time
6 you wrote this, why did you consider flashing of the
7 reference legs as a possible explanation for the
8 pressurizer level behavior?

9 MR. GLASSMAN: Are you asking for his
10 current recollection of what he was thinking
11 then?

12 MS. McDONALD: His recollection, unless
13 I say otherwise that's what I'm asking him.

14 A The conclusion would be drawn that there
15 would be an inaccurate level indication in the
16 pressurizer due to the reference legs being in some
17 other state than completely filled with liquid.

18 Q Did it subsequently, subsequently to
19 this entry, come to your knowledge that in fact the
20 pressurizer level which was seen was in fact the
21 accurate pressurizer level?

22 A I don't recall.

23 Q You wrote here one reference leg is going
24 to be filled with water to verify correct level.

25 How does filling the reference leg with

1
2 water verify the correct level based on your
3 understanding at this time?

4 A If the reference leg is filled with water
5 from another source then we know that the reference
6 leg is indeed full, there is a guarantee that in fact
7 everything that is in there is liquid. If that is
8 the case then it would indeed be indicated the level
9 it was calibrated to.

10 Q Would you turn the page to page 06072.

11 Based on your understanding of how these
12 logs were kept, can you review the log and tell me who
13 relieved you, apparently relieved you?

14 A Jack Garrison relieved me.

15 Q Do you recall informing Mr. Garrison of
16 the unexpected pressurizer level behavior that you had
17 witnessed or that you had recorded?

18 A I don't recall the conversation.

19 Q Was it your practice to review with the
20 oncoming shift what had gone on with your shift?

21 A Yes, it was.

22 Q Do you see in the middle of the page 06072
23 an entry which reads, "Pressurizer level transmitter
24 RC-LT3 was backfilled at reference leg. Comparison
25 was made between LT1, LT2 and LT3. All three were

1

2

reading same. Pressurizer level indication as

3

shown in control room is believed to be correct."

4

Do you see that?

5

A Yes, I do.

6

Q Do you recall being told or hearing

7

somehow that the pressurizer level response which you

8

had described in your entry was in fact correct and

9

that the pressurizer level had in fact increased?

10

MR. GLASSMAN: Could I have that read

11

back?

12

(Question read.)

13

A No.

14

Q After you observed this unexpected

15

pressurizer behavior, did you mention that to

16

anyone, did you have any conversations about how this

17

could be?

18

MR. GLASSMAN: Objection. I don't think

19

there has been any testimony that

20

Mr. Dominguez personally observed that. He

21

talked about his notes, but I don't believe

22

he personally observed that.

23

MS. McDONALD: He testified that he

24

remembered this happening.

25

MR. GLASSMAN: I think there may be some

ambiguity.

Q Do you remember the pressurizer level?

A I do not remember this particular phenomenon occurring.

Q Were you accustomed to writing down false things in the log?

A No.

MR. GLASSMAN: Objection. I think the nature of my prior objection and what I had suggested that counsel ask really related to know whether it was true or false. We all see the note and the note is in front of us.

The objection was whether this was a personal observation of Mr. Dominguez or whether he recalls the source of the information contained in the note.

That's all.

Q Do you recall the source of the information contained in the note?

A No, I do not.

Q Do you recall that shift test engineers were required to try to make sure that everything they wrote in the log was accurate?

THE WITNESS: Would you read the question

back, please.

(Question read.)

MR. GLASSMAN: Objection as to form.

By "try to make sure," are you referring to some investigation of it or are you referring to just putting down impressions at that point in time. "Try to make sure" is somewhat vague.

MS. McDONALD: You may answer the question.

MR. GLASSMAN: The witness can answer the question if he understands it.

A Yes.

Q Were you aware of any requirement saying that the shift test engineers are solely responsible for the the accuracy of all entries in the log?

A I don't recall that statement ever being made.

Q Do you recall anyone telling you that it was imperative that all entries into the log be objective, factual, timely and not reflect personal opinion or personalities?

THE WITNESS: Read that, please.

(Question read.)

A Yes.

Q Who told you that, was that during

1

2 your training?

3

A Mr. Toole told me that.

4

5 Q Did you take that to heart and try to
6 comply with that?

7

A Yes, I did.

8

9 Q Again, on page 06072, do you see
10 an entry two-thirds of the way down the page it says
11 "Whenever RC-V137 was opened to vent pressurizer, level
12 would indicate an increase"?

13

Do you see that?

14

A Yes, I see it.

15

16 Q Do you recall any conversations or do you
17 recall it in any way coming to your attention that
18 every time the pressurizer was vented pressurizer
19 level would go up?

20

21 A I don't recall having a conversation of
22 that type.

23

Q Would you turn to the next page.

24

25 Do you see the entry that begins right
below where it is written September 9, 1977?

26

A Yes.

27

28 Q Can you tell who relieved Mr. Garrison,
29 based on your understanding of how these logs were
30 kept?

1

2

A Yes, John Ulrich relieved Jack Garrison.

3

Q Do you know where Mr. Ulrich is presently

4

employed?

5

A I believe he is employed with Metropolitan

6

Edison Company.

7

Q Do you see kind of in the middle of that

8

page, that's page 06073, it says "Closed RCV137 and

9

applied nitrogen to the pressurizer. The pressurizer

10

level came down proving that there was a steam bubble

11

in each of the hot legs. Left nitrogen on until

12

pressure started to slightly increase and secured

13

nitrogen."

14

A Yes.

15

Q Just for the record, Mr. Dominguez, N₂ is

16

nitrogen?

17

A That's correct.

18

Q Do you recall having it come to your

19

attention that when the vent at the top of the

20

pressurizer is closed and nitrogen was applied

21

pressurizer level came down?

22

A Please read that?

23

(Question read.)

24

A I do not recall the specific instance.

25

Q Would you look at page 06074. Can you

1

2 tell from this log entry that you relieved Mr. Ulrich?

3

A Yes.

4

5 Q Again, was it your practice when coming
6 upon shift to discuss what had gone on in the plant with
7 the shift test engineer that preceded you on shift?

7

A Yes.

8

9 Q Was it also your practice, as I believe you
10 testified before, let me just ask it again, to review
11 the prior log entries when you came on shift?

11

A Yes, it was.

12

13 Q Do you have any reason to believe that you
14 did not review Mr. Ulrich's log entry when you came on
15 shift on September 9, 1977?

15

A No.

16

17 Q Do you recall having any discussions with
18 Mr. Ulrich regarding where he apparently had written
19 that the pressurizer level came down proving that there
20 was a steam bubble in each of the hot legs?

20

21 A I do not recall a conversation with
22 Mr. Ulrich.

22

23 Q Based on your understanding of how the
24 system worked and your training up to this date, did
25 you understand how it could be that there would be a
steam bubble in the hot legs?

1

2

A No.

3

4

Q You don't recall going and asking anybody how that could be?

5

6

A I don't recall having conversations of that nature.

7

8

9

10

11

Q Was it your understanding at or about this time that in a reactor coolant system which was solid and filled with water that when nitrogen was applied to the top of the pressurizer level would go down or would it stay the same?

12

13

MR. GLASSMAN: Are you asking him whether that was ever considered?

14

15

MS. McDONALD: I am asking whether based on his knowledge at that time.

16

17

THE WITNESS: Please reread the question.
(Question read.)

18

19

A I don't believe I ever considered the situation.

20

21

22

23

24

25

Q Well, Mr. Dominguez, you had a bachelor of mechanical engineering from Penn State. You had training on pressurized water reactors in the Navy. You had several courses in physics and you have had some courses in thermodynamics. You had been trained to a certain extent at Met Ed.

1
2 I am asking you not whether you
3 specifically considered that possibility. I am asking
4 you based on all of the knowledge that you had
5 thinking back to what kind of knowledge you had then,
6 what would you have expected to happen?

7 MR. GLASSMAN: I object to the totally
8 hypothetical realm. The witness said he did
9 not consider it. Moreover, I think he testified
10 sometime earlier that he had never even seen
11 solid operations except in hydrostatic testing,
12 and even there he didn't know that he had
13 actually seen them so you can ask him a question
14 about something he recalls, but it's
15 inappropriate to get into some hypothetical area
16 about whether piecing together some part of some
17 education which we haven't identified --

18 MS. McDONALD: I have identified it. And
19 I am entitled to ask him what all of his training
20 led him to know about the operation of a
21 pressurized water reactor. I do not have to be
22 limited to things which actually happened in the
23 pressurized water reactor.

24 MR. GLASSMAN: You can ask him that, what
25 his training told him.

1
2 MS. McDONALD: That's all I asked him.

3 BY MS. McDONALD:

4 Q Can you answer the question?

5 MR. GLASSMAN: Do you understand the
6 question?

7 THE WITNESS: Yes.

8 A If the loops are completely full of water
9 and the pressurizer is completely full of water, and
10 pressure is applied to the top of the pressurizer I
11 would expect to see no change in level of significance
12 in the pressurizer.

13 Q Well, whether or not you remember discussing
14 Mr. Ulrich's apparent entry with him on that day, do
15 you recall any conversations with anyone up to the time
16 you left Metropolitan Edison regarding the possibility
17 that a steam bubble had formed in the hot legs during
18 this September '77 event?

19 A I don't recall having a conversation as
20 to that nature.

21 Q Do you recall any surprise registering in
22 your mind with regard to anything that happened in
23 this event regarding bubbles in the hot legs, possible
24 bubbles in the hot legs?

25 A You are referring to John Ulrich's entry

1

2

there?

3

Q Yes.

4

A I don't recall any particular reaction
after reading that entry.

6

Q Would you refer to page 06078 of this log.
Do you see the entry beginning at the bottom of that
page, it says "Relieved Craig McMullin"?

9

A Yes.

10

Q If you would review the next couple of pages
through 06080, can you tell that that is in fact the
beginning of your entry, your signature appears to be
on page 06080 with the exception of some writing on
06079 which may not be yours.

15

MR. GLASSMAN: I am somewhat confused now.

16

MS. McDONALD: All I want to know is,
apparently, Mr. Dominguez began entering on
06078. It continues on 06079 and is interrupted
with some other writing and then continues on
the bottom of the page and he signs it,
apparently, on page 06080.

22

Is that correct?

23

THE WITNESS: That's correct.

24

Q You talked before about Mr. Toole having

25

the practice of reviewing the log. Do you see an entry

1
2 in the middle of your entry on 06079 which appears to
3 be written by Mr. Toole?

4 A Yes.

5 Q Are you familiar with Mr. Toole's
6 handwriting for reviewing these logs?

7 A No, I am not.

8 Q Was it your practice to review whatever
9 Mr. Toole had written in the log?

10 A Yes, it was.

11 Q Towards the end of Mr. Toole's entry,
12 number 6 reads: "There is no reason given for how we
13 got into problems on pressurizer level. A change to
14 cooldown procedure could be made if we knew what to
15 do."

16 You will recall discussing with Mr. Toole
17 a problem about pressurizer level that had occurred
18 during this incident?

19 A I don't recall having a discussion with
20 Mr. Toole concerning this incident.

21 Q Do you recall reviewing this entry?

22 MR. GLASSMAN: Aside from any review with
23 counsel?

24 MS. McDONALD: Yes, reviewing this entry
25 at or about the time it was written.

1

2

A I don't recall reviewing it, no.

3

Q But it was your practice to do so, however?

4

A But it was my practice to do so, yes.

5

Q What training, if any, did you receive

6

after this September incident to explain to you what

7

had happened?

8

A The September incident?

9

Q This incident we have been discussing here.

10

A Training subsequent to that particular

11

incident to explain it?

12

Q To review or go over what had happened

13

during the incident.

14

A Well, I don't recall anything. I don't

15

recall any training to explain the phenomena.

16

Q As far as you recall up until the time

17

you left Met Ed you never got an explanation of why

18

that pressurizer level had gone up unexpectedly? As

19

far as you know no one ever told you why?

20

A I don't recall receiving an explanation

21

as to why that occurred.

22

Q Do you know who Mr. Illjes is, Ted Illjes?

23

A The name is familiar. I cannot recall what

24

position he had.

25

Q Do you have any recollection of what

1

2 Mr. Illjes was doing, if anything, with relation to
3 this incident?

4

A No, I do not.

5

Q You testified that you were in part
6 concerned with the resin migration in this incident,
7 is that right?

8

A Yes.

9

Q What did you do with respect to the resin
10 migration?

11

A I was instructed to assist Metropolitan
12 Edison's staff in their investigation as to the extent
13 of the resin migration and come up with plans to
14 determine the extent of it and means of resolving the
15 problem.

16

Q So I understand, did you have to go
17 somewhere out of the control room to look at where the
18 resins might be?

19

Do you understand the question?

20

A Yes. The time frame of this would be --
21 the investigation occurred several days after the
22 actual incident occurred. The corrective action that
23 was taking place occurred over a period of a month or
24 so subsequent to the incident.

25

Q As far as you remember you were not

1
2 involved in investigating what had gone on with
3 respect to the resin until a few days after the
4 event?

5 A That's correct.

6 Q At the time you wrote the entry that's on
7 page 06071, were you in the control room?

8 A I would be unable to place my location in
9 the control room at any specific time during the shift.

10 Q Well, can you from reviewing the log and
11 based on your knowledge how you made log entries tell
12 me whether you were probably in the control room when
13 you wrote something about pressurizer level?

14 A I was not in the control room. It was not
15 my habit to write entries into the log in the control
16 room, but rather in an office that was off to the side
17 of the control room.

18 Q In other words, if you wanted to write
19 something in the log, you would leave the control room
20 and go to some other office?

21 A Yes.

22 Q Where was that office?

23 A It was off to the side of the control room.

24 Q As far as you recollect, however, you
25 weren't somewhere totally different, away from the

1

2

control room when you wrote this?

3

4

MR. GLASSMAN: I think the witness just
said he couldn't tell you that.

5

6

MS. McDONALD: Well, I asked him based
on his knowledge of how he made log entries.

7

8

A From my recollection all log entries were
made in the office that was off to the control room.

9

10

Q Do you recall having any conversations
about this event, by "this event" I mean the one we
were discussing in September 1977 with Mr. Hartman?

11

12

A I don't recall having a conversation with
Mr. Hartman concerning this event.

13

14

Q Mr. Scheimann?

15

A No.

16

Q Mr. Frederick?

17

A No.

18

Q Mr. Faust?

19

A No.

20

Q Mr. Zewe?

21

A No.

22

23

Q Have you ever had any conversations with
anyone other than a gentleman from the NRC and counsel
about this event?

24

25

A I do not recall any other conversations.

1

2

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Q You never received any phone calls from anyone at GPU or Met Ed to ask you what you remembered about this event?

A No, I never received them.

Q Were you ever asked by anyone other than counsel to review this document that I am about to show you which has been previously marked as B&W 837. I just want to know whether you have ever seen that? The document is entitled "TMI-2 September 1977 Hot Functional Testing Event."

A No, I have never seen this before.

Q Have you ever seen what has been previously marked as B&W Exhibit 838 entitled "GPU Nuclear Technical Data Report Analysis of TMI-2 September 1977 Event During Hot Functional Tests"?

A I don't recall ever seeing this report.

Q As far as you remember then you had no input into these reports?

A I don't recall ever having input to these.

Q In 1981 you were already employed by Pennsylvania Power & Light, were you not?

A That's correct.

Q I would like to refer you to some charts that are attached to B&W Exhibit 838. The pages I

1
2 want to refer you to are headed "Figure 2, Pressurizer
3 Level Increase From 107 to 320 inches 6:30 a.m. to
4 9:15 a.m. 9/8/77" and "Figure 3, Pressurizer Level
5 Increase from 305 to 385 inches, 2100, 9/8/77."

6 I want to ask you if this chart refreshes
7 your recollection in any way as to whether you ever
8 saw pressurizer lever solid indicated at TMI-2 other
9 than possibly in hydrostatic tests?

10 A No, it doesn't.

11 Q Do you see on Figure 3 that for a period of
12 time pressurizer level was somewhere between 350, at
13 least according to this graph between 350 and 400
14 inches?

15 MR. GLASSMAN: Objection. We can all
16 agree that the figure shows what it shows, but
17 this witness hasn't seen it before, so it's
18 inappropriate to ask him questions about that.

19 MS. McDONALD: I want to see if his
20 recollection is in any way reflected by this
21 document prepared by GPU.

22 MR. GLASSMAN: I think he's already told
23 you that it wasn't, but you can ask him that
24 again: The question is whether this document
25 refreshes your recollection.

1

2

A No, it doesn't.

3

4

5

Q I take it you have no reason to believe that this chart attached to GPU technical data report is inaccurate?

6

7

8

9

MR. GLASSMAN: Objection. I instruct the witness not to answer. The witness has not reviewed this document before. He's testified that he had not seen it.

10

11

12

Q Have you ever had any conversations with anyone from something called the Hart Committee, the congressional committee?

13

14

15

16

17

18

A No.

19

20

21

22

Q After the Three Mile Island accident had you had any conversations other than the NRC conversation we have already talked about about anything having to do with your employment at Met Ed?

23

24

25

MR. GLASSMAN: Other than conversations with counsel?

MS. McDONALD: Yes.

A I can't recall any conversations of that nature.

Q Do you recall that any change to the cooldown procedure was made after this September event as a result of what had happened?

1

2

A No, I don't.

3

Q Do you recall any conversations with

4

Mr. Toole regarding his entry, apparent entry, saying

5

a change to cooldown procedure could be made if we

6

knew what to do?

7

A I don't recall a conversation with

8

Mr. Toole concerning that.

9

Q Mr. Hawkins?

10

A Or Mr. Hawkins.

11

MS. McDONALD: Off the record.

12

(Discussion off the record.)

13

Q Mr. Dominguez, I have one other question

14

about this event: Based on your understanding of how

15

the system worked at TMI-2, am I correct in thinking

16

that if the reactor coolant pumps are off that the

17

spray to the pressurizer is inoperable, was inoperable,

18

normal spray to the pressurizer?

19

A I believe that's correct.

20

Q I would like to show you a portion of

21

what's already been marked as B&W Exhibit 174 which

22

is a shift test engineers log.

23

Q I am showing you pages 06000 through 06002

24

of B&W Exhibit 174.

25

On page 06001, do you see an entry made

1

2 by you?

3 A Yes.

4 Q The entry starts "Relieved Craig McMullin,"
5 and then continues on the next page until it is signed
6 by you, is that right?

7 A Yes.

8 Q And that's your handwriting and that's your
9 signature?

10 A Yes.

11 Q Is this an entry for August 12, 1977
12 according to the log, can you read the date next to
13 your name?

14 MR. GLASSMAN: That's obviously what it
15 says?

16 A Yes, I didn't hear the question, yes, it is.

17 Q Referring to the bottom of page 06001
18 you wrote, "Started investigating makeup tank level
19 decreasing excessively. Discovered NDTT relief
20 leaking by using downstream temperature indication
21 on computer. Shut RC-V2 and cycled the NDTT relief and
22 reopened RC-V2 with no further leakage noted."

23 Is that your handwriting?

24 A Yes.

25 Q Mr. Dominguez, was the NDTT relief valve

1

2

the same valve as the PORV, but in a different mode?

3

A To the best of my knowledge, yes.

4

5

Q The pilot operated relief valve was a valve at the top of the pressurizer, is that right?

6

A Yes.

7

8

9

10

Q And at certain pressures, is it your recollection that that valve's setpoints would be changed; in other words, to make them the NDTT setpoints.

11

A I don't recall.

12

13

14

Q But in any event this NDTT relief that's mentioned here as far as you recollect was another name for the PORV?

15

A Yes.

16

17

Q What downstream temperature indication on computer were you referring to when you wrote this?

18

A I can only reword what is written.

19

20

MR. GLASSMAN: You are asking for his recollection?

21

22

23

MS. McDONALD: I am asking for his recollection of what indication there was, downstream of what?

24

25

A Downstream of the relief valve pipe there was a temperature indicator that was read

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on the computer.

Q Based on your recollection did you consider it possible to determine or to at least investigate whether the pilot operated relief valve was leaking by use of the downstream temperatures?

THE WITNESS: Reread the question, please.

(Question read.)

A Yes.

Q You went on to write "Shut RC-V2," is that the block valve of the pilot operated relief?

A I believe it is.

Q Based on your recollection of how the system worked why were you shutting the block valve, cycling the relief and then reopening the block valve? I mean, what is the purpose of that?

A When you shut the block valve, you remove the pressure on the relief valve. When you cycle the valve, you are giving it another opportunity to seat properly under a low pressure condition. With that amount of information, that's why we chose to do this.

Q While you were at Met Ed, was it your practice if you thought the PORV might be leaking to perform this evolution or whatever you want to call

1
2 it; namely, closing the block valve, cycling the PORV
3 and then reopening the block valve?

4 MR. GLASSMAN: I don't know what you mean
5 by practice. There has been no foundation as to
6 how often this occurred or whether it occurred
7 more than once.

8 MS. McDONALD: I don't mean to indicate
9 that it occurred a lot by use of the word
10 "practice" but if you thought the PORV was
11 leaking, what would you do?

12 A I would use the same procedure.

13 Q You wrote "Shut RC-V2 and cycled the NDTT
14 relief and reopened RC-V2 with no further leakage
15 noted."

16 How did you determine that there was no
17 further leakage?

18 MR. GLASSMAN: Are you asking for his
19 recollection?

20 MS. McDONALD: I am asking for his
21 recollection, yes. I am always asking for his
22 recollection, Mr. Glassman, and I think it's
23 inappropriate to constantly interrupt in an
24 attempt to remind the witness that he might not
25 remember this.

1
2 MR. GLASSMAN: I am not doing that at all.
3 I object to your comments. There has been no
4 testimony whether his recollection is based on
5 a note by Mr. Dominguez or whether this note is
6 based on somebody else.

7 MS. McDONALD: I don't think it makes any
8 difference.

9 MR. GLASSMAN: Your question had a lack of
10 foundation. You assumed that Mr. Dominguez did
11 something.

12 MS. McDONALD: Well, he wrote this.

13 MR. GLASSMAN: Well, he did write this,
14 yes.

15 MS. McDONALD: Does he just write things
16 out of the blue?

17 MR. GLASSMAN: You know full well as a
18 person with some experience that the notes can
19 reflect various things and you are here to be
20 able to ask him questions about it, not to make
21 assumptions or guesses. You may proceed.

22 Q Mr. Dominguez, how was it possible to
23 determine that there was no further leakage?

24 A It would be possible to determine there
25 is no further leakage by using the downstream

1

2 temperature indication on the computer.

3

4

5

Q Do you mean by that that the downstream temperature would then be lower than it was when you thought it was leaking?

6

A Yes.

7

8

9

Q Do you recall where you got this information that you wrote down here that you observed this or did some control room operator tell you?

10

11

A It was one or the other. I don't recall exactly which one.

12

13

14

Q Do you recall any conversations with anyone prior to the time you left Met Ed about how to determine whether the PORV was leaking?

15

16

A I don't recall having conversations of that nature.

17

18

Q Was that ever mentioned in your training?

19

20

21

Q Did the reactors with which you were familiar in the Navy have relief valves at the top of the pressurizer?

22

23

24

A To the best of my knowledge, yes.

25

Q Did you ever have occasion to investigate leakage on any of those?

A No.

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Q Can you tell me which shift this is based on, your knowledge of how these logs were kept? This being your entry on August 12, 1977.

A Well, Jack Garrison had the midnight shift from 11:00 to 7:00 and -- well, excuse me, that's not true. Craig McMullin had the first shift on the August 12, 1977, which would have been the 11:00 to 7:00 shift.

Q And then you came on, is that right?

A I relieved Craig McMullin so I had the 7:00 to 3 o'clock shift.

Q I would like to show you another portion of B&W 174 pages 06011 through 06015. And specifically I would like to refer you to page 06013 which appears to be an entry by Jack Garrison apparently for August 17, 1977.

Do you see that?

A Yes, I see it.

Q Now, if you follow along in this log, do you see that some later period you relieved Mc. McMullin on August 18, 1977 according to the log?

A Yes.

Q And again it was your practice to go back and review the prior log entries?

1

2

A Yes.

3

4

5

6

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8

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11

12

Q Now, on page 06013 do you see an entry that reads "NDTT relief appears to be leaking into reactor coolant drain tank" Closed RC-V2 and manually opened valve RC-RV2. Closed RC-V2 and reopened RC-V2. Monitored downstream line temperature and reactor coolant drain tank level. Indications were that valve was still leaking. Closed RC-V2 and allowed line to cool to approximately 125 degrees Fahrenheit. Manually cycled valve again and reopened RC-V2. Indicates valve is still leaking. Issued PR Number 5055."

13

Do you recall this event?

14

A I don't recall this particular event.

15

16

17

Q Based on your review today, do you see that it's another example of what we were talking about before?

18

19

20

21

22

23

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25

MR. GLASSMAN: Objection, the witness said he didn't recall it. He is not here to tell you now what he sees with regard to a document that he doesn't recall.

Q Do you recall prior to leaving Metropolitan Edison that on occasion the pilot operated relief valve would leak and that would be determined by use of certain indications such as downstream

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2 temperature or reactor coolant drain tank level?

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A I can recall that that was a method which
I employed to determine whether the valve was leaking
or not.

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Q And as you testified before, part of that
investigation might on occasion involve closing the
block valve and then monitoring the temperatures you
saw, is that correct?

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A Yes, that is correct.

Q I would like to show you a portion of
again, B&W 174, pages 06144 and 06145. Again this is
part of the shift test engineers log.

Do you see an entry on page 06144? It
starts: "Relieved by Andre Dominquez"?

A Yes.

Q And then do you see an entry that you
wrote, that is in your handwriting anyway?

A Yes.

Q Is that entry signed by you on page 06145?

A Yes.

Q Is there a date next to your signature,
October 7, 1977?

A 10/7/77, yes.

Q On page 06144 on the bottom, do you see,

1
2 it's written there, "Opened RC-V2"? Again, that's the
3 block valve, is that correct?

4 A Yes.

5 Q "And temperature downstream RC-RV-2 remained
6 at 123 degrees Fahrenheit"?

7 A Yes.

8 Q Do you remember, based on your understanding
9 and knowledge up to that time why you wrote that, what
10 that meant?

11 MR. GLASSMAN: You don't want him to
12 interpret this document for you now, you want
13 his recollection?

14 MS. McDONALD: Right.

15 A I am not really sure, but it appears to
16 be connected with some prior event as if, perhaps, I
17 was instructed to open the valve and record the
18 temperature.

19 Q Based on your training and knowledge up
20 to this time, was it your understanding that if the
21 block valve had been closed for a period of time and
22 then it was opened and the temperature stayed the same
23 that was at least some indication that the PORV was
24 not leaking?

25 A I believe that it could be interpreted

1
2 as such.

3 Q Having reviewed these log entries that
4 talk about the PORV, do any of them refresh your
5 recollection about any conversations you may have had
6 regarding how to determine whether the PORV was
7 leaking or not?

8 A No, they do not.

9 Q Did anyone ever tell you in your training
10 at Met Ed that you must never close the block valve
11 to the PORV?

12 A I don't recall that statement ever being
13 made.

14 Q Do you recall anyone that you talked to
15 ever expressing concern about closing the block valve
16 to the PORV?

17 A No, I never heard anybody expressing that
18 kind of concern.

19 Q I would like to show you another portion
20 of the shift test engineers log, and this portion
21 comes from B&W Exhibit 174 again, and I would like to
22 show you pages 06042 through 06045.

23 I would like to refer you to page 06044
24 which appears to be an entry made by John Ulrich on
25 August 30, 1977. Do you see towards the bottom

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of that page is written, "Relieved by Andre Dominguez"?

A Yes.

Q Above where it says that, Mr. Ulrich has apparently written "Successfully cycled RC-V2 after open torque switch was set to 1.5. Placed RC-R2 in auto and raised RCS pressure to 2275 psig. RC-R2 lifted at approximately 2250 psig. Sprayed down pressurizer to 2130 psig and RC-R2 never closed.

"The relay which actuates RC-R2 did drop out so it looks like RC-R2 is mechanically binding."

Do you recall reading that entry?

A I don't recall reading this entry.

Q But again it was your practice to review the prior entries and so forth, is that correct?

A Yes.

Q Based on your recollection of when you were the shift test engineer at Metropolitan Edison, can you tell me what relay is being referred to there? I don't mean its designation, but just what it says.

A A relay is a device which changes state, that is, it's either on or off. This particular relay referred to in this entry is the device which will turn on or open the valve or instruct us, if you will, to close.

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Q It was, based on your recollection, an electrical device which commanded the valve to open?

A Yes.

Q And if it was off the valve was electrically told to close, is that correct?

A In a manner of speaking, that is correct.

Q Do you recall it coming to your attention while you were at Metropolitan Edison that even though the status of the electrical signal to the PORV was telling the valve to close that it could nevertheless stay open for some mechanical reason?

Did that come to your attention?

A I don't recall it coming to my attention in this particular instance.

Q Do you recall it coming to your attention in general?

A It's a matter of fact in any case.

Q That a valve can stick open for a mechanical reason despite the status of the electrical signal that's going to it?

A Correct.

Q Do you recall any specific instances at TMI-2 of the PORV being open when it was supposed to be closed or being closed when it was supposed to

1
2 be open, specific instances?

3 A There was an occasion when the pressure --
4 excuse me, when the PORV was open, and the control
5 room did not have that knowledge.

6 Q Do you recall that event occurring in
7 March approximately of 1978?

8 A I don't recall the exact time.

9 Q Do you recall that there came a time when
10 a light was installed in the control room with respect
11 to the PORV?

12 MR. GLASSMAN: Are you talking about the
13 TMI-2 control room?

14 MS. McDONALD: Yes.

15 A I don't recall the actual installation of
16 a light. What I do recall is that there was a light
17 indication given associated with that particular valve.

18 Q Do you recall that that light was put in
19 after the event that you just described regarding the
20 PORV being open when it should have been closed?

21 A Yes.

22 Q Do you recall anyone from Met Ed or GPU
23 telling you what that light was for?

24 A I don't recall any specific instruction
25 as to what that valve -- excuse me, where that light

1

2

came from.

3

Q You do, I take it, remember there was at

4

some point a light there in the control room?

5

A Yes.

6

Q Do you recall that that light showed

7

whether or not power was going to the solenoid, the

8

PORV solenoid?

9

A As I recall that was the case.

10

Q Was it your understanding, in any event,

11

that that PORV could remain open for a mechanical

12

reason even though the electrical signal that was

13

going to the PORV was off?

14

MR. GLASSMAN: The witness just gave us

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his testimony a few moments ago about his general

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understanding regarding valves and electrical

17

signals. The question now is whether he particularly

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understood that with regard to this valve?

19

MS. McDONALD: No, I think really to make

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it more clear my question is:

21

Q Did you understand that what the light

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in the control room showed was the electrical status

23

of the PORV?

24

MR. GLASSMAN: I think he just answered

25

that. He understood that was power to the
solenoid.

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Q Is that right?

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A Yes.

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Q Am I correct in thinking that your

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understanding that you testified about before; namely,

6

that the valve could be open for a mechanical reason

7

despite the electrical status of the valve did not

8

change in any way after the light was installed in the

9

control room?

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MR. GLASSMAN: Objection as to form. The

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witness may answer it.

12

A My understanding did not change.

13

Q Did you have any conversations with

14

anyone after the light was installed regarding the

15

light?

16

A Not that I can recall.

17

Q Could you tell me again. I know we went

18

into this before, when you left Metropolitan Edison,

19

approximately what month was that?

20

A Approximately September.

21

Q Of 1978?

22

A Yes.

23

Q I would like to show you now another

24

portion of the shift test engineers log. This portion

25

comes from B&W Exhibit 176. I am showing you pages

1
2 06452 through 06454.

3 On page 06454, do you see an entry
4 that reads "Relieved by Andre Dominguez," signed
5 apparently "John Ulrich," dated March 29, 1978?

6 A Yes.

7 Q And do you see an entry written by yourself
8 and then signed by you?

9 A Yes.

10 Q Now, could you take a look at Mr. Ulrich's
11 entry and tell me whether you can tell that this entry
12 relates to the events that you testified to just now
13 where the PORV was open when it should have been
14 closed?

15 Just review his entry and see if you can
16 determine that?

17 MR. GLASSMAN: That's inappropriate.

18 If you are asking whether this refreshes his
19 recollection that's appropriate, but he is not
20 here to interpret --

21 MS. McDONALD: All right, I'll ask that.

22 MR. GLASSMAN: It's not in his handwriting,
23 that portion.

24 Can you rephrase the question?

25 Q Do you see on page 06453 it is written

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that 1440, it appears at this time that during ES testing the fuses on 2-IV inverter blew and gave a reactor trip and a full ES actuation. The electromatic relief valve lifted and pressurized the RC drain tank to approximately 100 psig. The inverter was put on alternate source and the HP injection stopped.

Does this refresh your recollection that the events that you were referring to before occurred on March 29, 1978?

A Yes.

Q Mr. Dominguez, do you see Mr. Ulrich's entry on page 06454, something that reads, "The pressurizer level was increased to approximately 200 inches. RCS pressure decreased to approximately 1200 psig before recovery started."

When you relieved Mr. Ulrich, did you have any conversations with him about that particular entry that he had written, apparently written?

A I don't recall.

Q Again, it was your practice to review prior log entries, is that right?

A Yes.

Q Do you recall any discussions while you

1
2 were at Met Ed with regard to pressurizer level
3 increasing reactor coolant system pressure decreasing
4 during this March 29, 1978 event?

5 A No.

6 Q Did you receive any training after this
7 March 29, 1978 event with regard to what had happened
8 during the event?

9 A I don't recall any training.

10 Q Based on all of your training and your
11 knowledge of how pressurized water reactors worked
12 up until this time, March of 1978, and again I want
13 you to think back and give me your recollection,
14 would you have considered it unusual to have
15 pressurizer level increase at the same time pressure
16 was decreasing?

17 MR. GLASSMAN: If you are asking whether
18 this was something that was considered, I will
19 let him answer it, but if you are asking how
20 he might have responded to some hypothetical
21 situation which he doesn't recall then it's
22 inappropriate.

23 MS. McDONALD: Mr. Glassman, we went
24 through this before, and you let him answer and
25 I said based on his training and his knowledge,

1
2 his training from everywhere and his knowledge
3 of how pressurized water reactors worked, would
4 he have considered it unusual to have pressurizer
5 level increase while pressure was decreasing,
6 and I am not limited to whether he knows of a
7 specific event or anything like that.

8 MR. GLASSMAN: You can ask whether he was
9 trained on that. I will permit him to answer
10 that, but to ask him whether he might have
11 considered it to be unusual to see something
12 which he was not trained for is inappropriate.
13 You can ask him what he was trained on and if he
14 was trained on it.

15 Q Mr. Dominguez, were you trained that it
16 was the usual reaction of a pressurized water reactor
17 that pressure would go down while pressurizer level
18 was going up?

19 A I don't recall receiving that specific
20 instruction.

21 Q In fact, weren't you trained the opposite?

22 A I don't recall.

23 Q I take it as best you can recollect, you
24 didn't express any surprise or astonishment to
25 Mr. Ulrich upon reading this entry?

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A I don't recall whether I was surprised or astonished or complacent after reading that.

Q Did you receive any training after this event which indicated to you that it was possible to have reactor coolant system pressure go down while pressurizer level was going up?

A Not that I can recall.

(Recess taken.)

Q Mr. Dominguez, prior to the Three Mile Island accident, did you know that voiding could occur in a pressurized water reactor in the primary system outside the pressurizer, and that that voiding could cause pressurizer level to increase?

A No.

Q Do you know that now?

A I really don't feel qualified in answering that. I have never assembled the facts of what had occurred in Three Mile Island and so I really don't feel qualified to say that.

Q I am not relating my question to anything related to Three Mile Island. I am just wondering if you know that today from any source?

A I have never seen it written or communicated to me that that was a source.

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2 Q Just so the question is clear: I am not
3 limiting my question to something you remember being
4 told or something you remember experiencing. Human
5 beings know things that they can't remember who told
6 them. I know that the sun came up on March 1, 1963.
7 I have no recollection of either seeing it or being
8 told it.

9 I would like to know whether you know in
10 your brain that voiding in the reactor coolant system
11 can cause pressurizer level to increase based on all
12 of your knowledge and training and college degree and
13 information that came into your head?

14 MR. GLASSMAN: Perhaps we are quibbling,
15 and this is a bit silly here, but it's a perfect
16 example, when you say that the sun came up on
17 March 1, in some particular area it may have
18 been cloudy, and you are saying, you know, you
19 are just assuming you know that. You are just
20 assuming that. That's precisely the point. It's
21 a silly example, but, for example, in another
22 part of the world, you could be in a part of the
23 world where it was cloudy.

24 MS. McDONALD: Are you saying that the sun
25 didn't come up if it was cloudy? I am trying

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2 to probe what this witness means by "no." I
3 think you have totally distorted what that
4 means here.

5 MR. GLASSMAN: I am not distorting anything.
6 I think the witness has told you what the state
7 of his knowledge is in this regard.

8 Can you ask him another question.

9 BY MS. McDONALD:

10 Q Mr. Dominguez, do you know today that
11 voiding in the primary system of a pressurized water
12 reactor can cause the pressurizer level to rise?

13 A Let me put it to you this way: I cannot
14 prove it, therefore I don't know it. Aside from
15 anything you feel counsel may have done to me this
16 is something which I determined, you know, that's
17 sort of the way I do business.

18 You must also recall that I haven't
19 even looked or thought of a pressurizer outside of
20 what I read in the papers since I left Metropolitan
21 Edison. It's a subject distant from my mind for
22 almost three years.

23 Do I know it, no, I don't know it. Does
24 it occur, I would say if there is documented evidence that
25 says it does, I would say yes it would; I would draw

2 that conclusion, I would work with it and I would in
3 fact believe it. I don't feel I can sit here and
4 assemble facts to convince myself but perhaps I could
5 convince other people that it was true.

6 Q Ans when you read, according to your
7 practice, Mr. Ulrich's entry in the shift test
8 engineers log saying the pressurizer level came down
9 proving that there was a steam bubble in each of the
10 hot legs, did you disbelieve that?

11 MR. GLASSMAN: I just object. The
12 witness said that he didn't recall actually
13 reading that.

14 MS. McDONALD: He said it was his
15 practice to review the log entries, Mr. Glassman.

16 MR. GLASSMAN: We agree on that, and he
17 said that several times, counsel, but there is
18 a difference between a practice and an actual
19 recollection of a particular entry. He told
20 you he didn't recall reading that particular
21 entry.

22 Q Did you ever recall reviewing any shift
23 test engineers log entry and thinking that what was
24 written there was impossible?

25 A You are treading on the philosophical

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2 regions of the question.

3 Q Can you answer it?

4 A I don't recall ever reading anything in
5 the shift test engineers log and thinking that it was
6 improbable.7 Q And when, and I know you don't recall
8 reading it specifically, and when according to your
9 practice, anyway, you reviewed Mr. Ulrich's entry
10 for March 29, 1978 which reads, "The pressurizer
11 level was increased to approximately 200 inches, RCS
12 pressure decreased to approximately 1200 psig before
13 recovery started."14 Did that remind you of the entry that you
15 had made in September of 1977 where you wrote
16 pressurizer level unexpectedly increased when venting
17 pressurizer and decreased pressure from 500 psig to
18 460 psig pressurizer level, pressurizer level
19 increased approximately 150 inches during this
20 evolution.21 MR. GLASSMAN: The witness said he
22 doesn't recall reading any of these particular
23 entries, it's impossible to say when reading
24 one brought back another.

25 He told you he doesn't recall reading

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2 them, counsel. I object.

3 Q You don't recall thinking that there was
4 any similarity between the events of March 28, 1978
5 and the events of September 8, 1977, you don't recall
6 thinking that?

7 A I don't recall.

8 Q When you heard about the Three Mile Island
9 accident, did that bring to your mind any events that
10 had occurred while you were at Three Mile Island?

11 A No, it did not.

12 MS. McDONALD: Off the record.

13 (Discussion off the record.)

14 MS. McDONALD: We have copied certain
15 portions of the documents which Mr. Dominguez
16 produced, and I will represent that what I am
17 about to mark came from what he produced.

18 The first document I would like to mark is
19 a document entitled "Pressurizer Lecture
20 Outline Prepared By: T. Hawkins."

21 I would like to have that marked as B&W
22 Exhibit 910.

23 (Document consisting of a "Pressurizer
24 Lecture Outline Prepared By: T. Hawkins," was
25 marked B&W Exhibit 910 for identification.)

2 Q Can you tell me what that document is,
3 Mr. Dominguez?

4 A That is a copy of the Lecture Outline
5 that Tom Hawkins used to instruct us about the
6 pressurizer.

7 Q Do you see your handwriting, little notes,
8 anywhere on this document?

9 A Yes.

10 Q Are all the notes in the margin and
11 otherwise your writing?

12 A They should be.

13 Q Do you see anything that's not your
14 handwriting?

15 Just flip through it.

16 A The notes on the letter "REM-II-7," the
17 signature of that, the handwriting on the three
18 pages following the letter. That should be it.

19 Q Is that a document that you maintained
20 while you were an employee of Metropolitan Edison?

21 A This was a document in my possession
22 while I was an employee with Metropolitan Edison, yes.

23 Q And it was part of your training, is
24 that right?

25 A Yes.

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Q Is that true of all of the documents you produced?

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A Yes.

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Q On the second page of this document, is that your handwriting?

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A Yes.

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Q Was this also a lecture outline prepared for your training?

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A Yes.

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MS. McDONALD: I would like to mark as B&W 912, a document entitled "Engineered Safety Features STE Briefing Notes Prepared By: M.J. Perry."

(Document entitled "Engineered Safety Features STE Briefing Notes Prepared By: M.J. Perry," was marked B&W Exhibit 912 for identification.)

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Q As you go through that, Mr. Dominguez, would you note if you see something that's not your handwriting?

A Yes. Page 9 is not mine, page 10, page 11, page 18, the questions on The ESAF Quiz are not mine, the answers are.

Q Referring to that ESAF Quiz, do you see comments on occasion under your answer appear to be written in felt tip pen?

A Correct, those are not mine either. Other than the noted exceptions the handwriting -- the notes on these lectures are mine.

Q And again this was a document you maintained as part of your training, is that right?

A Yes, I had it, correct.

MS. McDONALD: The next exhibit, B&W

913, a document called "Transient Analysis

Lecture Outline Prepared By: M.A. Nelson."

(Document called "Transient Analysis

Lecture Outline Prepared By: M.A. Nelson,"

was marked B&W Exhibit 913 for identification.)

Q Again, could you please note the things that are not in your handwriting?

A The handwriting on the letter entitled

1
2 TMI-2 Reactor Building Spray System. Figure 1, the
3 drawing following figure 1; the felt tip writing on
4 figure 1-1; the printing on figure 2-1. The printing
5 on figure 2-2; 2-3, 2-4, the two graphs following
6 figure 2-4. Figure 2-7; other than the noted
7 exceptions the written notes are mine.

8 Q Do you recall this lecture by Mr. Nelson?

9 A I do not recall this particular lecture.

10 Q Again, this is a lecture outline that you
11 had as part of your training at Metropolitan Edison?

12 A That's correct.

13 Q Do you recall why you were being taught
14 something about transient analysis?

15 A It was required.

16 Q By what?

17 A By Mr. Toole.

18 Q Should all the shift test engineers that
19 you knew of have had this similar training?

20 A Yes.

21 Q Was this training at which only shift
22 test engineers were present or other employees of
23 Metropolitan Edison and GPU present?

24 A The training always had the four STE's
25 present. There were on occasion seven other people

1
2 that could have been present depending upon the nature
3 of the subject.

4 Q There were seven other people, is that what
5 you said or several? I didn't hear you.

6 A Seven, I said.

7 Q Who were the seven?

8 A Typically the startup test engineers were
9 there, an example being Poje or Gatto. I believe there
10 were four, Mr. Toole and Mr. Hawkins were generally
11 present. Depending upon the topic you would have a
12 special lecture such as Lentz or Max Nelson.

13 Q Do you recall what Max Nelson's position
14 was at Met Ed or GPU?

15 A I don't recall what his title was.

16 Q Do you know which organization he was
17 employed by?

18 A GPU.

19 Q Have you ever had any training from B&G?

20 A Yes.

21 Q What training was that?

22 A On two occasions I attended their
23 simulator.

24 Q When were those occasions?

25 A The first occasion was when I was an

1
2 engineer level 1 with Met Ed.

3 The second occasion was following the
4 lecture series that we are discussing.

5 Q And how long a period of time were you
6 down at Lynchb n each of those occasions,
7 approximately?

8 A One to two weeks.

9 MS. McDONALD: I would like to mark as
10 as B&W 914, another document produced by
11 Mr. Dominguez entitled "TMI Unit 2 EP 2202-1.5
12 Pressurizer System Failure."

13 (Document entitled "TMI Unit 2 EP 2202-1.5
14 Pressurizer System Failure," was marked B&W
15 Exhibit 914 for identification.)

16 Q Mr. Dominguez, can you tell me what this
17 document is?

18 MR. GLASSMAN: Is this copied by counsel
19 from part of the same materials?

20 MS. McDONALD: Yes.

21 A I don't recognize the documents.

22 Q Mr. Dominguez, let me show you the
23 original of that document in the notebook that you
24 produced. Maybe it will help you. This notebook
25 bears the file number 2857-3-1.

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BY MS. McDONALD:

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Q Mr. Dominguez, did you put these tabs on this book?

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A Yes, I did.

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Q Could you take a look at the section which

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is tabbed "Emergency Procedures," and I would just like to ask you if that refreshes your recollection as to whether you had any training on emergency or operating procedures while employed at Metropolitan Edison?

7

A No, it does not refresh my memory.

8

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Q The last page of B&W Exhibit 914, is that your handwriting?

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A Yes.

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Q On the front of B&W Exhibit 914 --

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MR. GLASSMAN: So I am clear on this: We have B&W 914, it's not stapled and the material that's been pulled out as part of 914 contains a number of typed pages starting at page 1.0 going through 11.0 and a separate page at the end that in handwriting says "Compatability of material," and "corrosion minimize."

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Q Mr. Dominguez, do you see in the original of B&W 914 that the handwriting is in fact on the back of the last page of B&W 914?

22

23

It was just copied on a separate page when we copied it.

24

A Yes.

25

Q Can you tell me whether the handwriting

1
2 that Mr. Glassman just read in fact relates to the
3 next document in the original exhibit labeled
4 "Primary and Secondary Chemistry Plant Chemistry
5 Lecture Outline"?

6 A I can draw a conclusion, but I couldn't
7 really say for sure.

8 Q I take it seeing none of these documents
9 refreshes your recollection that you at any time
10 reviewed the pressurizer system failure procedure
11 which is in your book here?

12 A No.

13 Q Do you see on the front of that procedure
14 some handwriting, the first page?

15 A Yes.

16 Q Is any of it yours?

17 A No.

18 Q Do you see that somebody has written
19 there "PORC 12/11"?

20 A Yes.

21 Q Do you know what the PORC is?

22 A Yes.

23 Q What was that?

24 A It is the Plant Operation Review Committee.

25 Q What was that committee for?

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Do you recall?

A My recollection of the PORC was that it was to review procedures in light of safety related issues.

Q Do you see the name "Miller" at the top of B&W Exhibit 914?

A Yes.

Q Is that Gary Miller to the best of your knowledge?

A Yes.

Q Can you give me any explanation for why this procedure appears in your book?

MR. GLASSMAN: Are you asking him to guess?

A May I have the book back, please?

MR. GLASSMAN: Are you asking him to review the book and see if that can give him any indications --

MS. McDONALD: Yes.

A I can offer conjecture.

MR. GLASSMAN: We are not here for that. The question is whether reviewing the book -- let the record reflect that the witness has attempted to review the entire book or at least

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2 apparently some beginning portions of it as well
3 as the portions that counsel referred to. The
4 question is does reviewing this refresh your
5 recollection as to why emergency procedures,
6 in particular were included in a particular
7 section of this book?

8 THE WITNESS: I am not sure why those
9 particular procedures were included in that
10 section.

11 MS. McDONALD: I would like to mark as
12 B&W 915, the beginning pages of the book that
13 we have been referring to.

14 Let me just ask you to identify what is
15 going to be marked as B&W 915 is, in fact, pages
16 from the notebook that you produced?

17 THE WITNESS: Yes, they are.

18 MS. McDONALD: I would like to mark as
19 B&W 916 the first page of the emergency
20 procedures section, again, from Mr. Dominguez'
21 book, is that correct, Mr. Dominguez?

22 THE WITNESS: Yes, that is correct.

23 (Document entitled "Training Schedule
24 Update June 11, 1976, was marked B&W 915
25 for identification.)

1

2

(Two-page document entitled:

3

"Emergency and Abnormal Procedures," was

4

marked B&W Exhibit 916 for identification.)

5

BY MS. McDONALD:

6

Q I would like to ask you whether B&W 916

7

has your handwriting anywhere on it?

8

A Yes, it does.

9

Q Do you see opposite where it's written

10

"Pressurizer System Failure," that you have written

11

something?

12

A Yes.

13

Q Does it say "Thermocouple High Temp,

14

Increase Pressure, Temp, Level in Reactor Coolant

15

Drain Tank"?

16

A Yes.

17

Q Is that your handwriting?

18

A Yes, it is.

19

Q Does seeing that there refresh your

20

recollection as to whether you ever reviewed the

21

pressure system failure procedure?

22

A Quite truthfully, no.

23

MS. McDONALD: I have no further questions.

24

EXAMINATION BY MR. GLASSMAN:

25

Q Mr. Dominguez, I believe at the beginning

1

2

of your testimony today, you testified that when you

3

were in the Navy that you had never actually seen solid

4

operations, is that correct?

5

A That is correct.

6

Q Do you recall being told or instructed

7

in the Navy whether or not it was appropriate to

8

operate in a solid condition?

9

A Yes.

10

MS. McDONALD: Object to the form.

11

A Yes, and we were instructed not to operate

12

in a solid condition.

13

Q Were you instructed as to any situation

14

where it would be appropriate to operate in a solid

15

condition?

16

A No.

17

MR. GLASSMAN: I have no further questions.

18

EXAMINATION BY MS. McDONALD:

19

Q Your training that you just described or

20

in the Navy were you told why it was considered

21

inappropriate to operate in a solid condition?

22

A I cannot recall any specific reason why,

23

but to the best of my knowledge it's because it is

24

unsafe.

25

Q Is that because to the best of your

1
2 recollection, is that because operating in a solid
3 condition can result in very rapid pressure increases?

4 A To the best of my knowledge, yes.

5 Q Based on your training in the Navy was it
6 your understanding that solid condition meant all of
7 the reactor coolant system full of water including
8 the pressurizer?

9 A Yes.

10 MS. McDONALD: I have no further questions.

11 (Time noted: 1:25 p.m.)

12 -ooo-

13
14 ANDRE J. DOMINGUEZ

15 Subscribed and sworn to

16 before me

17 this day of , 1982.
18
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15

Dominguez

C E R T I F I C A T E

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

119

I, NANCY A. RUDOLPH, a
Notary Public within and for the State of New York,
do hereby certify that the foregoing deposition
of ANDRE J. DOMINGUEZ
me on Tuesday, August 17, 1982 was taken before

That the said witness was duly sworn
before the commencement of his testimony and
that the within transcript is a true record of said
testimony;

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

IN WITNESS WHEREOF, I have hereunto set
hand this 27th day of August, 1982.

Nancy A. Rudolph
NANCY A. RUDOLPH

I N D E X

WITNESS:

PAGE

ANDRE J. DOMINGUEZ

3

E X H I B I T S

B&W
IDENTIFICATION

908	One-page resume of Andre J, Dominguez.	4
909	One-page handwritten document	29
910	Document consisting of a "Pressurizer Lecture Outline Prepared By: T. Hawkins."	104
911	Document entitled "Decay Heat Removal System Lecture Outline Prepared By: S.G. Poje."	106
912	Document entitled "Engineered Safety Features STE Briefing Notes Prepared By: M.J. Perry."	106
913	Document called "Transient Analysis Lecture Outline Prepared By: M.A. Nelson."	107
914	Document "TMI Unit 2 EP 1101-1.5 Pressurizer System Failure."	110
915	Document entitled "Training Schedule Update June 11, 1976."	115
916	Two-page document entitled, "Emergency and Abnormal Procedures."	116

C E R T I F I C A T E

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: ss.:
COUNTY OF NEW YORK)

I, NANCY A. RUDOLPH, a
Notary Public within and for the State of New York,
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of ANDRE J. DOMINGUEZ was taken before
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my hand this 27th day of August, 1982.

Nancy A. Rudolph
NANCY A. RUDOLPH

I N D E X

WITNESS:

PAGE

ANDRE J. DOMINGUEZ

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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

-----X
GENERAL PUBLIC UTILITIES CORPORATION, :
JERSEY CENTRAL POWER & LIGHT COMPANY, :
METROPOLITAN EDISON COMPANY and : 80 Civ. 1683 (RO)
PENNSYLVANIA ELECTRIC COMPANY :
 : AFFIDAVIT
Plaintiffs, :
 :
- against - :
 :
THE BADCOCK & WILCOX COMPANY and :
J. RAY McDERMOTT & CO., INC. :
 :
Defendants. :
-----X

STATE OF PENNSYLVANIA)
 : ss.:
COUNTY OF *LUZERNE*)

I have read the transcript of my deposition taken on
August 17, 1982 and together with the attached corrections, it
is accurate to the best of my knowledge and belief.

Andrés Domínguez

A. C. Domínguez

Signed and sworn to before me
this *26* day of October, 1982.

Margaret C. Jetter

Notary Public

MARGARET C. JETTER, Notary Public
BERWICK BORO, LUZERNE COUNTY
MY COMMISSION EXPIRES MAR. 4, 1985
Member, Pennsylvania Association of Notaries

Corrections to A.J. Dominguez Deposition Transcript
September, 1982

<u>Page</u>	<u>Line</u>	<u>Correction</u>
8	18	"machinest" should read "machinist"
8	23	"machinest" should read "machinist"
8	24	"on a nuclear plant trained," should read "on the nuclear plant,"
8	25	"machinest" should read "machinist"
9	5	"Greenland" should read "Greenling"
22	6	"recirulate" should read "recirculat
25	2	"level in a band to operate between" should read "level band to operate i
32	6	"they're" should read "they're an"
35	18	"documented or reviews what" should read "documented reviews that"
42	11	"They use" should read "I used"
54	5	"particular conversation" should rea "particular log entry"
58	8	"indicated" should read "indicating"
75	8	"lever" should read "level"
86	15	"Dominquez" should read "Dominguez"
89	24	"us" should read "it"
102	6	"Ans" should read "And"
109	19	"B&G" should read "B&W"