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PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

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DEPOSITION of GENERAL PUBLIC UTILITY SERVICE
CORPORATION by HERMAN MAIER DIECKAMP, held at the
offices of Shaw, Pittman, Potts & Trowbridge,
Esqs., 1800 M Street, NW, Washington, D.C. 20036,
on the 15th day of August 1979, commencing at
8:35 a.m., before Stephen McCrystal, Notary Public
of the State of New York.

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

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METROPOLITAN EDISON COMPANY:

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SHAW, PITTMAN, POTTS & TROWBRIDGE, ESQS.
Attorneys for Metropolitan Edison Company
1800 M. Street, NW
Washington, D.C. 20036

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BY: ALAN R. YUSPEH, ESQ.
of Counsel

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PRESIDENT'S COMMISSION ON THREE MILE ISLAND:

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JOAN GOLDFRANK, ESQ.
Associate Chief Counsel

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H E R M A N M A I E R D I E C K A M P ,

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having been first duly sworn by Joan

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Goldfrank, Esq., took the stand and testified

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as follows:

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DIRECT EXAMINATION:

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BY MS. GOLDFRANK:

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Q Could you state your name and spell it
for the record, please.

22

23

A Herman Maier Dieckamp, H-e-r-m-a-n -- M-a-i-e-r
-- D-i-e-c-k-a-m-p.

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25

Q Your present business address?

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1
2 A 260 Cherry Hill Road, Parsippany, New Jersey.

3 Q And your present employer?

4 A General Public Utilities.

5 Q And your present position?

6 A I am president and chief operating officer
7 of General Public Utilities. I am a member of
8 the Board of GPU and I am a member of the Board of
9 each of the GPU subsidiaries, that is Jersey Central,
10 Metropolitan Edison, Pennsylvania Electric Company,
11 and the GPU Service Company.

12 Q You also are the president of the Service
13 Corporation, correct?

14 A That's right.

15 Q When did you first become employed by
16 General Public Utilities?

17 A I joined GPU on the first of March 1973.

18 Q And what position did you have at that
19 time?

20 A It was executive vice president of the Service
21 Company.

22 Q When did you become president?

23 A I became president about a year later and
24 I don't happen to know the exact date of that,
25 but, you know, sometime in 1974.

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2

Q You became president of the Service

3

Company about a year later?

4

A Yes.

5

Q When did you become president of GPU?

6

A The same time I became president of GPUSC.

7

Q And where were you prior to coming to

8

GPU?

9

A I worked for Rockwell International, their
Atomics International Division, and just prior to
joining GPU I was the president of the Atomics
International Division of Rockwell.

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Q How long had you been employed by

14

Rockwell International?

15

A Well, I went to work in 1950 for North
American Aviation, and the segment of North American
Aviation that was called the Aerophysics Laboratory
subsequently became the Atomics International Division,
and then in 1967, North American Aviation merged
with Rockwell Standard to form Rockwell International,
so I was effectively with the same organization
through name changes starting around 1950 through
the early part of 1973.

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Q Prior to 1950 --

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A I was in school.

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Q Where were you in school?

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A University of Illinois.

4

Q What did you receive your degree in?

5

A In Engineering Physics.

6

Q Was that a Bachelor of Science?

7

A Yes.

8

Q Do you have any graduate degrees?

9

A No graduate degrees.

10

Q Have you served in any of the armed

11

forces?

12

A No.

13

Q What was your first position with

14

North American Aviation?

15

A Well, I guess you could best describe it as

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new engineer laboratory flunkey almost. The

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activities that were being conducted by that

18

group at that time were largely associated with

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radiation damage to materials, and one of the

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initial things I became involved in was measurement

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of physical properties of graphite as a function

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of temperature as its radiation defects and damages

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were being annealed out by those temperatures.

24

The organization also was working on what are

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called lattice studies where you have a mechanical

1
2 or physical array of fissionable material inside
3 a moderating material which was D20 heavy water.
4 So I assisted in some of that kind of work to
5 study the characteristics of that kind of thing.

6 Very shortly thereafter we were involved
7 in constructing a Van de Graff electronic accelerator
8 that I was strictly involved in the operation of
9 and subsequently used for performing radiation
10 damage experiments on metals.

11 So, you know, just a broad spectrum
12 of those kinds of laboratory kind of things relating
13 largely to basic behavior of materials when sub-
14 jected to radiation.

15 Q And you gradually worked your way up
16 within the structure until you left Rockwell
17 International in 1973, and at that time you were
18 president of the division?

19 A Yes.

20 Let me just thread a couple of things
21 there. The next area that I was involved in was
22 the startup of research reactors, solution-type
23 reactors. These are ones that are quite small and
24 the water solution of uranium nitrate that makes
25 them work. And I spent a fair amount of time

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starting up a 50 kilowatt research reactor at the Armour Institute of Technology in Chicago, and I guess that must have been in 1956-1957 or so kind of a time period.

I spent time in that same 1957-1958 time period planning and sort of thinking out the activities of the startup of a 20 megawatt thermo-sodium graphite reactor that we had built in California. It is one of the early reactor development programs for the AEC then.

From that point, in about, I guess, 1958 or so, I moved into what was called the SNAP Program, which was Systems for Nuclear Auxiliary Power and that ultimately led to the successful launching and operation in orbit of a reactor powered power plant to produce 500 watts of electricity for a satellite.

It was a defense-related application in the early periods.

That program also led to other elements that led to the development of reactors intended -- small, of this size (indicating) that intended to operate at outlet temperatures up to 1300 degrees Fahrenheit, based on zirconium hydrate as the

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moderating material -- an ally of zirconium and hydrate.

After that I moved in to the fast reactor work that we were doing at Atomics.

Somewhere around that time period I also became vice president of Engineering for Atomics International for perhaps a period of five years or so, which would make it 1968, 1967 through 1972 and early 1973. I was heavily involved in fast reactor designs and Startup Project Management, and I guess you could almost call it selling and lobbying, almost, trying to work with utilities and work with the Government Congressional Committees to try to gain acceptance of fast breeder reactors for this program, and it was through that program, starting in about 1967 or 1968, that I became acquainted with the people at GPU, because we formed an alliance, an agreement with GPU wherein they became our utility sponsor for a portion of this fast breeder development work, and then that gave me a several year time period during which I became known as the GPU management, and that subsequently led to an employment offer from GPU, which I accepted in early 1973.

1
2 So now I have told you the whole history.

3 I notice one of the questions here is
4 "What licenses do you hold?" I don't hold any now,
5 but in that 1955 time period, I was granted one of
6 the AEC early, very early reactor operator's
7 licenses for the research reactor activity.

8 But I must hasten to add that is a
9 long ways from today's large power reactors.

10 Q You never had a license on a commercial
11 power plant?

12 A No.

13 Q In March of 1973 when you came to GPU,
14 your first position was as executive vice president
15 of the Service Corporation?

16 A Right.

17 Q And what were your responsibilities
18 in that position?

19 A Well, the responsibilities largely related
20 to the technical portions of the organization
21 as contrasted with the financial aspects of
22 the organization, even though I was in a position
23 to and encouraged to apply my background and experience
24 to all aspects of the ongoing activities.

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But, you know, if you just said what were the things I immediately paid the most attention to, they would be the technical operating, engineering aspects of the company; and my participation in the financial areas, rate-making areas, was almost more of an on-the-job kind of thing. You know, it was a different environment, a different set of goals, a different set of standards and objectives, and so it takes a while for one to accommodate to those and assimilate all those various differences over an organization, you know, basically in character with the manufacturing organization and the piece that I was dominantly associated with was heavily involved in R&D type of work.

So again, I became involved in the technical and basically all parts of the activity, but clearly also a carry-through from my background was the interest in the nuclear activities of the company.

Q When you initially came to the Service Corporation, was it explained to you the rationale of why the Service Corporation was set up?

A Well, I am sure that the concept of a service

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2 company and the concept of a holding company tends
3 to be somewhat mystical or obscure to most people,
4 but when asked about it, I usually say that I think
5 you should think of the service company as though
6 it were a corporate staff and it really does basi-
7 cally two different things; it does corporate staff
8 functions, and then it provides actual services,
9 and I think there are a number of things developing
10 in the utility industry that led to the transition
11 to the point where a service company or a stronger
12 corporate staff became a desirable thing, and you
13 will see that pattern in a number of utility holding
14 companies.

15
16 Probably one of the initial impetuses
17 was the nuclear activities -- and I am sure you
18 have heard of the establishment, I guess, in
19 what, the late 1960's, 1966 or 1970, something
20 like that of what is called the Nuclear Activities
21 Group and the fellow that headed that up at the
22 time was Lou Rodish and the purpose of that was
23 to aggregate the company's competence in the nuclear
24 field and to not attempt to reproduce that same
25 competence over and over in each of the sub-
sidiaries in a complete sort of way.

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2 At the same time, though, the onset
3 of large scale computers suggested, you know, the
4 advantages and economies of centralized computing,
5 and so that was one of the key services rendered.

6 The service company or the corporate
7 staff performs another function of providing cross-
8 functional coordination, information transfer, and
9 policy guidance to their like functions in the
10 operating subsidiaries of the company.

11 The service company also manages the
12 financings for the individual operating companies.
13 The service company also manages the rate case
14 activities for each of the subsidiaries in re-
15 lationship to its state regulators, so there is
16 a spectrum of sorts of policy guidance, direct
17 services, aggregation of skills so as to improve
18 the effectiveness, hopefully minimize the minimum
19 critical mass kind of a problem of how many people
20 do you have to have to do a given operation,
21 things of that sort.

22 Now, one of the things is that in a
23 utility holding company we end up with some rules
24 on the part of the Securities & Exchange Commission
25 stemming from the Holding Company Act that limits

1
2 the manner in which operating companies of a holding
3 company can charge for the work performed back and
4 forth among them, and the service company is an
5 acceptable vehicle for doing that.

6 A service company can have the charter
7 to perform services and bill the individual subsidiaries
8 for that work, so, too, in a sense, there is kind
9 of a structural issue that arises out of these
10 SEC Holding Company Act limitations that causes us
11 to give it that formalized terminology of a
12 service company as contrasted with simply calling
13 it a corporate staff as you would in an ordinary
14 corporate structure.

15 Q Once you came to the Service Company,
16 was there any discussion of merging the operating
17 functions of the utilities with the Service
18 Corporation so that the utilities would merely
19 be distributors of electricity?

20 A I am not aware of any particular thrust
21 along that line. We did, about the time I joined
22 the company -- but I think it was something that
23 was under way for quite a while -- merge together
24 two operating companies in New Jersey, Jersey
25 Central Power and Light and New Jersey Power and

1
2 Light, something, New Jersey Power and Light or
3 Jersey Central -- I am not sure what their names
4 were -- were merged together and that was strictly
5 a matter of just efficiency of operations to not
6 have to have duplicating management and also to
7 simplify the matter of rate-making so that instead
8 of having to have individual rate cases for two
9 individual subsidiaries, you could do this in one
10 activity. That move had been under way for quite
11 a while to combine those two. They had even had
12 joint management for some period of time.

13 In terms of the move towards segregating
14 into a generating company versus distribution
15 companies, that is the subject that was discussed
16 off and on, but we never really made any significant
17 steps in the direction of doing it.

18 If you will look at other companies,
19 probably New England Electric Systems is one of
20 the better examples of that kind of an
21 operation and sometimes, depending upon the degree
22 of financial difficulties or stress that you are
23 facing, there is a tendency to think that perhaps
24 the major investments associated with generating
25 stations and the rate-making challenges associated

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2 with those developments, might be more -- let me
3 say it slightly different -- might be subject to
4 less local politics if they came under the jurisdiction
5 of the FPC or what is now FERC as contrasted with
6 the local state regulators, and so in a sense, there
7 is also the feature that if you could pool all
8 of these assets into a generating company, you
9 would have a bigger individual base of capital
10 from which to support the additional increments of
11 capital that you need to build for the future.

12 But there are some very difficult
13 problems, both financial and legal, and I am not
14 even in a position to describe these complete.
15 They are very difficult problems, difficult bar-
16 riers at this sort of time in the history of
17 the state of development of GPU to be able to
18 effectively achieve that kind of a thing, to move
19 all of these activities into a generating company
20 and thus relieve the operating companies of the
21 management responsibility for generation and
22 let them devote their energies towards distribution,
23 customer service and things of that sort.

24 Again, it is a difficult kind of thing,
25 and so though this idea was also something that

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2 seemed to have degrees of appeal, the barriers to
3 getting there were such that we never felt we
4 were in a position to make that move.

5 We also discussed, in the earlier period
6 of my presence -- it didn't ever progress in any
7 way -- we discussed the relative merits of having
8 individual nuclear operations at Jersey Central,
9 Met Ed, and the Service Company, and from a technical
10 point of view, management point of view, early on
11 I felt that there were some potential advantages
12 of merging these nuclear operations.

13 One of the things that I found very
14 disturbing is that within the same company we would
15 find a great absence of a commonality in specifica-
16 tions, particularly in areas that could be common,
17 things like Quality Assurance, Health Physics,
18 Security, and things of that sort, and what we
19 were sort of frustrated with was that each plant,
20 in the process of trying to serve its needs and
21 in a process of negotiating with a separate segment
22 of the NRC and perhaps only separate in the sense
23 of a different individual, would apparently come
24 up with a different set of words, a different
25 solution to what could have or what should have

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2 been a common problem, and so there is a frustration
3 there that tended to make each of these operations
4 unique, and again, impeded their simple putting
5 together.

6 So, you know, as we can see, as in
7 anything there are some pluses and minuses of
8 making any kind of an organizational move, and
9 you have to ask yourself the question, "Am I really
10 making an improvement or am I simply shuffling the
11 blocks, and when it is all over, perhaps I still
12 have the same people and have I really changed
13 anything?"

14 So we did not move aggressively in that
15 direction.

16 It is true that towards the beginning
17 of 1979, as we were encountering some problems,
18 particularly at Oyster Creek with Health Physics,
19 compliance and just the quality of the operation
20 there, we renewed our thinking about merging
21 the nuclear operations so as to provide a single-
22 minded, concentrated management of those operations.
23 We were talking about it. We were in the process
24 of kind of formulating our thoughts, not feeling
25 any extreme urgency about it when the accident

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2 occurred.

3 Some time then after the accident, we
4 did file with the FEC in order to achieve the
5 necessary charter revisions for the Service Company
6 to allow us to do that.

7 There is another feature of that that
8 I think has its merits and one that we need be
9 working on again, which is not limited by organiza-
10 tional structure, but potentially influenced by it,
11 and that is we felt, as time went on, that it was
12 increasingly important to break down any organizational
13 barriers between the operating companies and the
14 Service Company, with particular emphasis on the
15 business of making sure that the kinds of technical
16 decision making that went into the new plants
17 adequately and properly reflected the kind of ex-
18 perience that we were having with the operating
19 plants. And the direction that we were moving in
20 to achieve that was one of building to the engineer-
21 ing capabilities of the Service Company so as to
22 be in a position to provide additional levels of
23 direct engineering support and thus involvement
24 in the day-to-day, ongoing activities at the
25 operating plants and thus, through a common pool

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2 of engineering specialists, talent, serving both
3 the operating needs of the operating companies
4 and participating in the design, direction, design
5 review of new plants, we would achieve a mechanism
6 of this transfer of experience from the operations
7 into the new generating stations. And we felt that
8 that could be an effective way to do that.

9 Again, I have to say that when one
10 thinks about these kinds of things, there are many
11 barriers to the simple accomplishment of them.

12 At least they are perceived as barriers.
13 I don't mean to say that they are such that it is
14 impossible to do it, but any time you start to
15 do something like that and you say, "Well, my gosh,
16 what is the problem we are going to have with the
17 NRC of transferring the license, do we have to
18 shut down the plant and have a hearing while somebody
19 ascertains whether the new structure is okay or
20 whether the new structure has the financial capa-
21 bilities, what have you? We have also got these
22 problems, with the Holding Company Act," just
23 as I said.

24 If you were in an ordinary industrial
25 environment and you wanted to set up some kind of

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2 a modification to the operations of a given activity,
3 you just go ahead and do it. In the utility business
4 you are constrained by the Holding Company Act,
5 and as a demonstration of that, you have to go to
6 the SEC and get this charter revision.

7
8 So while you could get it done, it
9 is not an impossible task by any means of the
10 sort, I am just saying that there are these kinds
11 of little impediences all the way along to hinder
12 you from doing it, but as I said, I don't think we
13 felt at any point that the structure we had was
14 inadequate or inappropriate. We rather felt that
15 there were ways in which we wanted to improve it
16 as we kept building towards the future.

17
18 Again, I say with respect to the operations
19 I was always troubled by these differentials in some
20 of the specifications and Quality Assurance Plans,
21 Health Physics Plans, things like that. It impeded
22 the ability to just take maximum advantage of a
23 cross-coupling of operations, a transfer of infor-
24 mation, a commonality of procedures and an ability
25 to transfer people back and forth because they were
almost forced to be different by the licensing
mechanism.

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2 We wanted to move in the direction of
3 improving the coupling between the operating plants
4 and the new plants, and we felt that greater common
5 engineering pool was a way to do that.

6 We also anticipated a lessening of the
7 amount of outside industrial support that we might
8 be able to call on in the event that the nuclear
9 industry weakened just due to a lack of sales or all
10 of those problems that we relate to the nuclear
11 industry.

12 So we felt for the future it was going
13 to be increasingly important for us to achieve a
14 higher degree of technical, technological self-
15 sufficiency, recognizing that we could never
16 approach true technological self-efficiency in the
17 nuclear business.

18 And so these were the directions that
19 we were going and the things that we were trying
20 to do.

21 I guess I have talked for a long time
22 about a generating company.

23 Q That is fine. That is what we are
24 here to talk about.

25 You indicated that one of the concerns

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2 about merging the nuclear operations into one corporate
3 entity was the differences between Oyster Creek and
4 both units at TMI. Do you feel that there should
5 be a standard nuclear plant with standard --

6 A Well, let's back up on that. The plants are
7 clearly different technically and there is nothing
8 you can do about that, and I think it will be
9 a long time before anyone is able to be very clear
10 about the merits or demerits of the degree of
11 technical diversity that we get from boiling
12 water reactors and pressurized water reactors.

13 The specific item that I was thinking
14 in terms of was the procedural, regulatory relation-
15 ships to what I would call supporting functions
16 that are not that specifically related to the design
17 as to whether it is a pressurized water reactor
18 or boiling water reactor, and that namely is
19 the procedures and the regulations relative to
20 things like Security, Health Physics, Quality
21 Assurance.

22 Now, in a sense, let's just talk about
23 those. As a general matter I would not suggest
24 that those be absolutely common throughout the
25 industry because I think a regulatory body or the

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2 Government or whoever has difficulty when they
3 are rigid in terms of the details of the require-
4 ments and provide no latitude for organizational
5 preferences, peculiarities, styles, whatever it is.
6

7 So I think there is some degree of
8 flexibility there that is useful, but within the
9 GPU System, I would have preferred if we had the
10 same Quality Assurance Plan for the two plants which
11 required the same paperwork, the same approaches
12 and things of that sort. I would have found that
13 useful to us.

14 I couldn't assert though that that would
15 be the optimum for the situation for Utility Z
16 off to the side.

17 (Continued on the next page.)
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2 Now, with respect to commonality of design,
3 again, I think, you know, I would not say one design
4 because I think there is always some benefit in a
5 diversity of design approach. I think also one has
6 to recognize that when you begin to talk about this,
7 you are talking about going back and recreating
8 the world over the last 20 or 30 years. It is
9 naturally an option that is readily available today,
10 except for some in-the-future kinds of activities.

11 Philosophically, though, I do happen to be one
12 of the believers that, knowing what I know today as
13 contrasted with what I knew 15 years ago, I think that
14 we could have done a more effective job in the intro-
15 duction of nuclear power and potentially achieved a
16 higher degree of operating reliability -- I don't know
17 about safety, but maybe -- if we minimized the numbers
18 of designs, and I think a significant feature of that
19 would be to make the operating experience from the
20 operating plants more directly intercomparable and
21 intercorrelatable, so that you could feel more
22 comfortable about the validity of any observations
23 that came out of the operating experience because you
24 were dealing with a situation where the designs would
25 be essentially common, and operating observations

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2 would add meaning to that design, and you wouldn't
3 be confused with whether these observations were in
4 some way a unique product of a unique design, and
5 thus a certain reluctance to recognize or accept
6 that observation as having general generic value.

7 So I think that if one had a minimum number of
8 designs, you would be in a posture where you could
9 more readily deduce generic behavior, good and bad,
10 more readily deduce its significance and feed it
11 back into the improvement process and thus more
12 rapidly achieve a level of reliability, a level of
13 confidence in the safety features.

14 Now, I also have to hasten to add that the
15 regulatory environment would have had to be recon-
16 structed in my perfect world. Instead of the regulatory
17 requirement that we have had, which has, you know,
18 more or less experienced also a continuing growth in
19 its knowledge and awareness and the depth of levels
20 of concern, and thus an ever-changing set of require-
21 ments and criteria and interpretations with respect
22 to design implementation, which directly militates
23 against any attempt to have a common design, but
24 however, again, if I were redesigning my perfect
25 world, what I would say to the industry and the

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2 regulators is, "Let's have Design A, and let's leave
3 Design A basically fixed for some number of plants,"
4 whether it is 10 or 20 or 30, I don't know, and then--
5 after having, you know, not just blindly freezing
6 but not willy-nilly changing -- you know, if anything
7 came up that was truly substantial, surely you would
8 have to make that change -- but have a basic commitment
9 to commonality, and then after some level of experience
10 with those plants through the design, construction, and
11 operational phases, to assess the quality of that
12 design and let that assessment be the basis for Mark I,
13 the next block of plants, and again, a rolling pro-
14 gression then, but each time recognizing that "I am
15 not necessarily smart enough with total paperwork
16 analysis to be sure that my sense of values about
17 how to optimize the design is correct; I need
18 experience feedback to tell me more about that sense
19 of values to make sure that I haven't strayed, that
20 I haven't misplaced my emphasis on one thing or
21 another."

22 Now, I think in the safety area, I think you
23 would have again had this ability, then, to observe
24 safety-related performance and reliability, dependa-
25 bility, what have you, and gained a sense of values

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2 about the relative importance of things, and I think
3 in doing that, one of the major advantages that you
4 might have enjoyed is to achieve the same, if not
5 higher reliability of safety with less complexity
6 because I think one of the serious problems philo-
7 sophically -- I can't prove it; I don't think anybody
8 can prove it one way or the other -- and that is,
9 by virtue of adopting almost every analytical idea
10 without any really hard way to assess the relative
11 merits of these ideas, we have added complexity to
12 the plant without necessarily recognizing the degree
13 to which that complexity, of itself, may be militating
14 against the increment of safety that you are trying
15 to achieve. It is very possible, in my mind, that
16 we have gone beyond some point of diminishing return.
17 Again when we think in terms of the levels of
18 reliability that we are looking for, and as the
19 reliability gets better and better, the probability
20 of encountering a deficiency in the design becomes
21 lower and lower, and it becomes difficult, really,
22 in a simple hardware, cut-and-dried approach to
23 achieve that. You have to depend on your analytical
24 insights to a large extent, but still, I think a lot
25 could have been achieved by simplifying systems to

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2 achieve an end result rather than by just continuing
3 to add more and more stuff.

4 I think there would have been other benefits in
5 terms of the ultimate lead times for building plants,
6 the ultimate costs of plants, things of that sort,
7 but again, we are talking now about my reconstruction
8 of the perfect world, and I don't know about our ability
9 to ever do that. And again, that doesn't say
10 what we have done is absolutely bad or wrong. As I
11 said, it is always the case of what I know today
12 versus what I knew X years ago, or what I think I know
13 today; I guess I should say it that way.

14 Q How do you train a utility to enter into
15 the nuclear field, a utility that has traditionally
16 been a fossil fuel utility?

17 A I am not sure that there is a specific pre-
18 scription for that, but certainly there are a number
19 of ingredients that I think contribute to the basic
20 way in which you start from ground zero and get to
21 where you want to be, recognizing that many portions
22 of the plant, just as equipment, are not unlike what
23 you would be operating in a fossil-fired plant. You
24 have got pumps and turbines and generators and boiler
25 feed pumps and condenser pumps and condensate

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2 polishing system, and so all of the water feed, water
3 steam, power conversion side is the same. The main
4 thing that is different, of course, is the nuclear
5 heat source and the recognition of its potential
6 for hazard and the kind of discipline, then, that
7 one has to apply to that kind of an operation in
8 order to achieve the safety that is so mandatory.

9 So I think what has happened is -- again, I
10 have entered this scene when the company had one plant
11 operating for a number of years and two plants under
12 construction -- but inherently one has to start with
13 the generation people that you do have and their back-
14 ground of experience with respect to all of the water
15 technology, steam technology, turbines, pumps, et
16 cetera.

17 Then I am sure that many companies have tried
18 to, in effect, acquire the nuclear "smarts" by hiring
19 people largely from the nuclear Navy, where you had
20 a lot of people who were trained in the discipline of
21 nuclear operations. I suspect that not many utilities
22 have hired many people, or they are harder to come by,
23 the people who have the in-depth analytical knowledge
24 of the behavior of the reactor itself and its physics
25 and its transient or its time behavior, the basis for

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2 accident potential, its heat transfer limitations,
3 all those kinds of things that are very fundamental
4 to safety.

5 Then I think you inherently, in the process
6 of a long term, during which you participate with
7 the architect-engineer and the nuclear steam supplier
8 in the decision-making to build the plant and to get
9 the plant licensed, so that provides you a considerable
10 time period then, during which you have to assemble
11 the staff, and that staff becomes knowledgeable about
12 engineering technical decisions and the basis for them.
13 Again I think the key piece of that is the utilities'
14 prime role vis-a-vis the NRC in carrying forward the
15 safety analysis and the licensing process, even though
16 a major fraction of the analytical backup and input,
17 you know, the detailed code calculations, may well
18 come from the nuclear steam supplier.

19 Then, as the plant nears operation and you go
20 through an extended startup period, you have the
21 opportunity for the plant staff to gain a real
22 hands-on familiarity with the plant and the operation
23 of the equipment as you go through the non-nuclear
24 startup testing program.

25 Then you couple that with other kinds of

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2 training programs relating to nuclear technology, and
3 procedure preparation is a major task that kind of
4 forces you to think your way through a lot of the
5 problems and the basis for the handling or the
6 solution of those problems, and then the simulator
7 training for the operators and the like.

8 I think that, and I know it has been our hope
9 or, you know, it was our purpose to feel that we had,
10 for a number of reasons, the safety obligation, but
11 also just the business of the extreme degree to which
12 financial resources were committed to nuclear power,
13 that we had to be sure that we understood what it was
14 that we were biting off, and so we have had a tendency
15 to be as involved as we could be in the management of
16 the design and construction of the nuclear plants,
17 and we have attempted to move in a direction to acquire
18 this spectrum of skills that would let us do a lot
19 of our own calculations in the limiting area of the
20 reactor dynamics and reactor heat transfer and the
21 kind of things that, on the one hand, contribute to
22 steady state fuel management and power level limits,
23 but at the same time are the same elements that are
24 the guts of whether the plant is safe or not, as to
25 whether that reactor is cooled.

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2 So we have felt that we needed to acquire knowhow
3 in that, recognizing that we, again, might not ever
4 get to the point of being self-sufficient -- we would
5 always be going back to either the nuclear steam
6 supplier or the fuel supplier for a high degree of
7 support in those detailed safety analysis calculation
8 kind of things -- but by having our own competent staff
9 in the field, we would be better able to understand
10 what was being done by our support contractor or sub-
11 contractor or supplier, better be able to stand up
12 ourselves and say, "Yes, we understand what is done,
13 and yes, we agree with it," being better able to com-
14 municate with that support organization and know what
15 they are doing, still recognizing, though, that I
16 think it would be very difficult for a utility to get
17 to the point of having the full range of nuclear
18 science technology to be totally self-sufficient,
19 and this goes all the way back, then, to not only the
20 business of having the necessary calculational tech-
21 niques and people and codes, but also the basic
22 laboratory-level development work where some of the
23 correlations and codes are found that validate these
24 things. And I think it would be a mistake to try
25 to reproduce those. It would not be sensible one

2 way or the other.

3 I think -- well, so you said, how do you make
4 this transition, and I think that there are a number
5 of things that happen in parallel over a long, fairly
6 long period of time. You know, we are talking maybe
7 10 years from the time you place the order until the
8 time the plant is starting to operate, and if you
9 go back, let's say -- in the GPU companies, it wasn't
10 that long with, let's say, Oyster Creek, but then
11 also, the companies have experienced a significant --
12 let's face it, a growth in the awareness of the
13 obligation.

14 When you look at the earlier plants, it was
15 thought that they could be operated with a staff of
16 maybe 75 or 80 or 90 people. At Three Mile Island
17 today, we have more guards than that, leave alone full
18 staff. Clearly there is a problem of acquiring this
19 different level of skill to get there.

20 I think there is also, certainly, the problem
21 of making sure that management is aware that a dif-
22 ferent skill is involved and that there is a different
23 level of technology that one has to have insight into
24 because it is the basis for your procedures and your,
25 you know, your overall sense of values about the care

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2 of the operation.

3 You know, one of the things I always say is
4 that we need to approach these plants in a different
5 way than driving a Chevrolet off the showroom floor.
6 We can't make the assumption that just anybody can
7 operate it without understanding what is in the guts
8 of it, what makes it tick, what limits it, what
9 potential does it have, what undesirable potential
10 does it have, and therefore, how do we cope with that.

11 So I think the time, the mechanisms, the ability
12 to do it are there. I am sure that it is done in
13 varying paths and varying degrees and then, you know,
14 as you get into it, as you have your first plant, well,
15 of course, then you become more knowledgeable about
16 the demands of that plant; you have an increasing
17 number of people, a base from which to build and
18 opportunities for training and things of that sort.

19 Q Do you think that it would be beneficial
20 to a utility entering the nuclear generating field
21 to go through some kind of an apprenticeship with
22 another utility whereby they could gain experience
23 that way?

24 A Well, I have never really thought about it
25 that way. We certainly have, in effect, been able --

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2 and I think fortunately -- been able to utilize the
3 nuclear Navy as a major apprenticeship relative to
4 plant operators. I am not sure that working with
5 another utility relative to an operating plant now --
6 certainly it is not a bad thought at all. I am not
7 sure, though, of the relative merits or relative
8 importance of that in contrast with the business of
9 simply working on your own problems during that
10 extended procurement, construction and licensing phase.
11 I am sure that there are certain things that you don't
12 really appreciate until you are faced with them
13 yourself, and oftentimes, simply observing somebody
14 else doing something doesn't quite get you a full
15 recognition of what it takes to achieve that.

16 Then I think we shouldn't lose sight of the
17 fact that I think one of the things that is changing
18 relative to the utility industry, and I think espe-
19 cially the nuclear people in the utility industry, is
20 that there is a much higher degree of mobility among
21 those people than there was, let's say, in the other
22 traditional aspects of the business, the fossil
23 generation and transmission and distribution. These
24 people are in demand, and they tend to move around
25 more. They are younger people. They are less --

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2 there is less of a feeling of having taken on a
3 lifetime job and that kind of thing.

4 But, you know, I think the idea is not, or the
5 suggestion or the concept is not a bad one. I
6 couldn't feel, though -- I don't think I could feel
7 that it would be a major difference. I somehow kind
8 of feel that maybe it would be a 10 percent add to
9 what you have got to do, rather than the real central,
10 dominant piece of how you get there, and again, I
11 guess the question comes down to do you get that
12 better by having six guys on assignment or ten guys
13 on assignment with Company Z, or do you go get that
14 simply by hiring ten guys who have some nuclear
15 background, whether it is from another utility or
16 whether it is from one of the Government enterprises,
17 the national laboratories or the Navy program or the
18 suppliers. I think you probably get the same kind
19 of thing.

20 Q As I understand it, the Service Corporation
21 was responsible for the design and construction of
22 Three Mile Island Unit 2.

23 Q And in that position, the Service Company
24 would or had a contract with an architect-engineer,
25 Burns & Roe, to design the nuclear power plant and

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2 would review those designs?

3 A Yes.

4 Q How much reliance is placed on the
5 architect-engineer in terms of the kind of design?

6 A Could I back up just a little bit and say that
7 the Service Company's role I would liken unto that
8 of a program manager with some degree of technical
9 staff, and the role of the program manager is to inte-
10 grate, coordinate the activities of a number of sub-
11 contractors that make up the team that are going to
12 ultimately put that power plant into place, and the
13 nuclear steam supplier, B&W or Westinghouse or whoever,
14 is certainly a very central part of that team because
15 he is supplying the primary nuclear components of
16 the system.

17 The role of the architect-engineer, then, is to
18 provide what we might almost call the housing for
19 those elements, to couple that nuclear portion to
20 the non-nuclear, conventional steam portion of the
21 plant, to provide the auxiliary support systems,
22 and to, in that role, sort of act as the guy who is
23 putting together all the drawings and specifications
24 that then get constructed.

25 Then the role of the Service Company as program

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2 manager for this thing was really to make sure that
3 the various elements of this composite team were
4 working together, were working towards the same
5 schedule, working towards the same set of specifi-
6 cations or objectives, were seeking where there
7 were problems that had to be resolved, decisions made,
8 in order for this guy to tell this guy he has got to
9 have this here, that there, this is the requirement,
10 that is the requirement. Sometimes those things
11 have a conflict, or there is a tradeoff that has
12 to be made between this consideration and that
13 consideration, and the Service Company could ensure
14 that that tradeoff was made and that it was made to
15 our satisfaction.

16 Then, in terms of design reviews, recognizing
17 again that the plant ends up with an overall specifi-
18 cation in the form of what you are going to call the
19 preliminary safety analysis, the PSAR, is, in effect,
20 a performance specification for the plant, so a role
21 of the Service Company or the manager of this effort,
22 then, is to try and ensure at all times that the pieces
23 and parts and composite thing that is being put together
24 by the supplier and the architect-engineer, indeed,
25 conforms to those requirements of the PSAR, and then

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2 in addition, to kind of provide a design review,
3 overcheck or the like, to kind of test whether this
4 does that or does it meet the requirements or does
5 it reflect a certain degree of experience or
6 preference that we, as an organization, may have,
7 and the design review, I think, not in the sense of
8 a detailed double-checking or the like, but rather
9 design review in the sense of kind of an overview,
10 occasional spot-checking of things to see that it is
11 meeting our objectives and conforming to the specs,
12 that problems are being identified and getting
13 solved in a reasonable way.

14 But in terms of the details of a lot of the
15 design work, we, indeed, look to the architect-engineer
16 to bring to the job the requisite competence to do
17 that work in a dependable kind of way. We don't
18 attempt to double-team him; we rather attempt to
19 provide, as I say, some overview, occasional checks,
20 with the primary concentration, though, on cross-
21 coordination to make sure that interfaces are
22 identified, requirements are identified, problems
23 are solved, conflicts are resolved, and that we meet
24 the specifications.

25 You know, maybe I should just back up and say

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2 that when you look at the utilities, there is a wide
3 range of approaches to this. Some companies have
4 centrally a complete in-house engineering organiza-
5 tion that accomplishes this function of the architect-
6 engineer. Some companies do virtually nothing; they
7 essentially have one or two guys who sign a contract
8 with the architect-engineer, and the architect-engineer
9 delivers a finished product, in effect.

10 We have attempted to be kind of a middle ground
11 of playing a more active role in this pulling to-
12 gether of these constituent parts of the program and
13 managing it because, as I say, we have felt a couple
14 of things: one, that we needed to understand what
15 it was that we were getting, and we needed to be
16 assured that it was reflecting the kind of things
17 that we felt we wanted, and I guess another piece of
18 it was we felt that this kind of participation was a
19 way for us to be better ready to move in and accept
20 and operate that plant when it came time to operate,
21 and that included not only the design phase, but also
22 the construction phase in the field.

23 Q Was there ever any long-range plan to
24 have the Service Corporation serve as its own
25 architect-engineer?

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2 A I have said and I have felt that that was not
3 a particularly advantageous position to try to move
4 towards starting from where we are today and the like.
5 I have rather felt that we could have our greatest
6 effectiveness if we could achieve this level of
7 central engineering competence, skill, breadth and
8 depth necessary to provide solid engineering services
9 to the operating companies that supported the plant,
10 thus couple these people to the real world of the
11 operating plants, and then have these people concentrate
12 on providing the preliminary designs, preliminary
13 layouts, preliminary PSI diagrams, you might call them,
14 but the basic documents that prescribe the plant layout,
15 the plant performance, the key features of the plant,
16 and then turn that over to an outside organization
17 for detailed translation into drawings and detailed
18 specifications for procurement.

19 Again, we put our emphasis on the front-end
20 definition of the job, and then the subsequent
21 managing of the job in terms of resolving interface
22 problems, making sure the decisions are made, making
23 sure that the thing is tied together technically,
24 rather than devoting our attention and our resources
25 to the more detailed business of production of

2 drawings or that kind of thing, and that was sort of
3 the goal that we would have liked to have gotten to
4 in a period of perhaps three to five years. It is
5 not one that you just, tomorrow, decide I am going
6 to do, but I have not felt that starting from where
7 we were today to attempt to replace or supplant the
8 architect-engineer was a particularly worthwhile
9 objective because I think there are things that an
10 architect-engineer can bring to the job in terms of a
11 spectrum of experiences. You probably can prevent
12 yourself from becoming excessively in-bred by working
13 with an outside organization who has other experiences
14 with other clients and things of that sort.

15 So I think there is a balancing of what is
16 the right mix for something of that sort of thing.

17 Q With respect to the design and construc-
18 tion of Unit 2, Three Mile Island Unit 2, the Service
19 Corporation would have sent down certain design
20 criteria for Burns & Roe to then implement in a
21 design?

22 A I think that the thing you would have to point
23 to as being the source of those kinds of criteria
24 would be a combination of the PSAR and the design
25 criteria as they issued forth from time to time

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2 from the NRC.

3 I think in the time period that Unit 2 was
4 started, our input in terms of very much detail
5 relative to design criteria was probably not there
6 beyond what is contained in the PSAR, which is a
7 statement of the criteria, the performance levels
8 that the plant shall meet.

9 Q Was that because at the time, the Service
10 Corporation did not have as much depth in engineering
11 as would be gradually developed?

12 A I think it is a combination of things that,
13 you know -- when did Unit 2 start into engineering?
14 Probably in the 1968 kind of time period -- and so
15 certainly the company did not have the same level of
16 depth that it has even today, and clearly not what
17 we were shooting to get to.

18 Secondly, I think the general awareness on the
19 part of the utility industry in terms of the manner
20 in which this new device was going to involve much
21 greater attention to detail than prior experiences
22 with fossil plants was going to demand, and thus the
23 early establishment of design criteria and also a
24 lesser awareness of the manner in which the changing
25 criteria over the lifetime of the design and

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2 construction effort would impact the project, just
3 were not recognized in 1967-1968 at all. So I think,
4 again, we are back to that item that says, "If I knew
5 then what I know today as a result of what we have
6 gone through," and sort of what we have experienced
7 in a sense of values that we have acquired during this
8 time period, we would want to approach these jobs
9 differently, and that, again, was the basis for
10 having set out a plan to try to get there, again
11 recognizing that it takes a long time, and again
12 recognizing, if you even go to our next job prior to
13 the accident which had been moving toward high gear,
14 namely the plant at Forked River in New Jersey, it
15 is also difficult once a project gets under way to
16 sort of shift gears and backfit it.

17 It seems that you are always looking for that
18 opportunity when you can start clean, and somehow
19 it takes a long time to ever get there.

20 You know, when I joined the company, say, in
21 1973, TMI 1, TMI 2, Forked River were all projects
22 in being, and I may not be with the company before
23 they are finished -- by the time they are finished.
24 I don't know. It is long in the sense that it tends
25 to be a bit of a frustration in terms of the speed

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with which you can apply steerage. It is almost like
you are steering this monstrous oil tanker, and if
you are going to turn a corner, you'd better antici-
pate that 10 or 20 miles ahead of time.

(Continued on Page 45.)

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Q What specific lessons or learning experience was acquired from the design and construction of Unit 2 that would have been applied to Forked River?

A Well, I am sure there are a number of things that would have come out of not only the construction, but also the operation, but let me just enumerate some of them.

One of the things I think that one has to observe is that the cost and schedule of building a nuclear power plant is extremely limited by the ability to provide solid, complete engineering and component procurement sufficiently in advance of the construction activity to permit that construction activity to progress smoothly with a continuity of work, with an opportunity for planning of the right sequencing, of putting things in place. So one of the things we had said to ourselves that we were going to try to do was to apply definite ground rules to the extent that we could and would not be somehow forced upon definite ground rules for the degree of completeness of engineering before we would initiate procurement, before we would initiate construction.

I think one of the other things that one observes is that there is so much equipment that is

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intertwined and interwoven in one of these plants and that complex intertwining and interweaving is a great impedece to labor productivity, that we should spend more time thinking ahead of allocation of space or volume to given functions so there can be kind of a freedom of installing something without everything else threading through it and fouling it up.

You also learn that to the degree that you can have things done off the construction site, delivered to the site in pre-constructed, prefabricated, pre-checked out subassemblies or the like, it is of great benefit.

As we looked at Three Mile Island, we observed some very specific things that concern us in terms of the amount of provision or the quality of provision for maintenance in the presence of radiation. Now I think after the accident we perhaps even have a different view in terms of operations and maintenance in the presence of, not of normal operating levels of radiation but emergency levels of radiation. There is one area in the plant that the operating personnel was always fond of taking us to and showing us what was called "Valve Valley" and pointing out how unwieldly it would be to have to maintain anything in that

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2 situation.

3 These are difficult problems because once the
4 thing is embodied, it becomes obvious what the problems
5 are. It is a lot more difficult to, ahead of time,
6 anticipate the degree to which a given area is going
7 to become congested and thus have maintenance impeded,
8 particularly in the presence of radiation, and so I
9 think if you were to look forward today, you would say
10 "I certainly would want to try to do a much better job
11 of anticipating maintenance requirements in the
12 presence of radiation, making sure that things were
13 laid out so that there would be fairly direct access
14 to them and so that you could do these jobs with
15 minimum exposures to the people and the like."

16 One of the other major differences that we did
17 decide to do on Forked River -- I don't know that I
18 would relate it specifically to Three Mile Island 2 --
19 but we had made the decision three or four years or
20 something to go to the next level of technology
21 relative to the control room display and control
22 techniques and information availability approaches and
23 levels of computer assistance in the Forked River
24 plant. And I think while that was presenting a
25 significant cost uncertainty and a significant number

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2 of technical uncertainties, we felt that that was a
3 desirable trend in which to, you know, stick our neck
4 out and try to move. We recognized that we would like
5 to improve the ability of the operator to quickly be
6 aware of what was going on in the plant and understand
7 it. Again, I don't know that we were thinking in
8 terms so much of extreme emergency situations, but
9 just in terms of the normal operations, to better
10 couple the thing.

11 I think, you know, that is kind of the spectrum
12 of kinds of things. I am sure there are also a number
13 of detailed kinds of things that we became aware of in
14 the process of Unit 2. I know one of the things we
15 have talked about many times was limiting the numbers
16 and varieties of valves in the plant. Instead of
17 having each valve selection be a unique decision, just
18 start out by saying to the designer "This is the list
19 of valves to choose from" and maybe that wouldn't be
20 a perfect valve or the optimum valve for that point,
21 but let's just minimize the number of different pieces
22 and parts that we have to handle and accommodate,
23 restrict that list to things that we had experience
24 with in terms of maintenance problems, that kind of
25 thing, you know, just a wide variety of things of these

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1 kinds of learning.

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3 In fact, I would say that during my period with
4 the company, one of the things that I felt good about
5 was in observing the performance and response of the
6 organization during the final period of construction
7 and startup of Unit 2 as contrasted with Unit 1.
8 When we got around to doing Unit 2, we had a cadre of
9 fellows who had been through it before. They were
10 better able to anticipate the sequence of going through
11 the startup program, better able to anticipate the
12 kinds of problems they needed to be prepared for and
13 might encounter, and once those problems were
14 encountered, better able to resolve them. It was
15 just a stronger feeling of "We have been here before;
16 we know what to expect. When we have a problem, we
17 know how to handle it." And that was very evident
18 even though the Unit 2 startup was plagued by a couple
19 of very specific problems. The general capability of
20 the organization to move -- there was sort of a sure-
21 ness of foot that came, again, as I say, from having
22 been there before, and you would see it in terms of
23 the ability to anticipate problems and recognize what
24 we were going to have to do about it.

25 So, you know, it is hard to latch onto any one

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2 hard idea, but just a whole spectrum of learnings that
3 I think one can see as being translated forward as we
4 moved along.

5 Q With respect to the experience gained
6 from constructing and operating Unit 2, also Oyster
7 Creek and Unit 1, and to be applied specifically as
8 Forked River or other future nuclear plants that would
9 have been constructed, would that have been the func-
10 tion of the Service Corporation to gather and analyze
11 that experience at the previous or the existing
12 nuclear plants to be applied to future plants?

13 A The Service Company is responsible for the
14 design and managing the construction, and in that
15 sense certainly had that responsibility. We also, as
16 I say, were in the process of trying to tighten the
17 coupling to the operating plants to a common engi-
18 neering support function. I think we would have
19 improved the translation of operating experience which
20 would have been, you know, largely a matter of what
21 kind of components give trouble, what are the main-
22 tenance problems, what are the reliability problems,
23 what are the location problems, and things of that
24 sort.

25 In addition, we felt that we always wanted to

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2 try to transfer some people from the intended operating
3 organization to be part of the service company project
4 management function during the design and construction.
5 So, for example, in Oyster Creek -- and I think in the
6 last year we had transferred one or two guys speci-
7 fically out of the operating organization to join with
8 the service company program manager so that we had
9 right on board some of that operating point of view
10 sense of values.

11 The other thing that we were looking forward to
12 trying to do more of than we accomplished on Unit 2,
13 even though I think on both Unit 1 and Unit 2 we
14 accomplished some, is we felt that there were a number
15 of critical activities in the course of constructing
16 and starting up the plant that were ideal learning
17 experiences for the people that would subsequently be
18 in charge of the operation and maintenance of the
19 plant, and so we were starting to think about how the
20 manning for the next plant would take place and how
21 many of the people that were part -- one of the things
22 that happens is the basic manning put in place by the
23 operating company to operate the plant has to devote
24 an awful lot of its time and its energy, the dominant
25 part, to the development of procedures and all the

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2 training that is necessary -- but we felt also that
3 we wanted to see a number of people assigned speci-
4 fically to the construction and startup operation
5 that would be intended ahead of time to stay with that
6 plant as it moved into its operational phase because
7 there could be no better way for them to become
8 intimately aware of what was in the various bowels
9 of the plant and why it was where it was then to
10 simply be directly involved when it was being assembled
11 and constructed and checked out.

12 So we were, again, seeking ways in which to
13 minimize what might seem like a simplistic approach
14 of one isolated group of guys builds the plant and
15 another isolated group of guys comes in and operates
16 the plant. That is kind of the driving off the show-
17 room floor concept that we clearly did not feel was
18 in our best interests. And the ability to achieve
19 this jointness of effort while still recognizing that
20 the reason we had the design and construction manage-
21 ment in the Service Company was because we felt that
22 we would have the best level of competence if we
23 aggregated that into one solid group that could afford
24 this spectrum of skills necessary and didn't distribute
25 it among the different operating companies, and we

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2 felt that the business of managing engineering and
3 construction was, in many ways, a different set of
4 skills than those associated with operating and safely
5 operating the plant once it was built. But still,
6 those were not absolutely separate distinct functions.
7 There was a need for a conscious level of overlap, a
8 conscious mechanism for awareness and for transfer as
9 you went downstream, and ultimately the best way to
10 achieve that was with people moving back and forth
11 rather than paper moving back and forth.

12 Q How was the integration with the engineering
13 and the operating accomplished with respect to Unit 2?

14 A I think there was some of that. I think there
15 was not as much as we felt we wanted to put into place
16 as time went on. I think Met Ed people did, to some
17 degree, participate in the design reviews, even though
18 I am sure that was not as extensive as -- you know,
19 if you look at it today you would say we would have
20 liked to have had as perhaps an extensive participa-
21 tion as the operating people say they should have had.

22 Again, I think it was a compromise of trying to
23 get the composite job done without asking each guy
24 to do everybody else's job at the same time, and then,
25 of course, there was a significant transition that

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2 happens during the latter part of construction and
3 the startup program when the operating people are,
4 in fact, manning all of the activities and are getting
5 ready to sort of take over the -- what should I call
6 it -- the responsibility for the plant. I think in
7 the process of looking at that in the past, I, myself,
8 felt frustrated by the demands for the procedure
9 writing, control room training, and those kinds of
10 things, because they tended to be such a dominant
11 objective and requirement on the part of the operating
12 people that it left them virtually no flexibility to
13 assign people to the construction and startup activity
14 other than just people that were going to be then the
15 ultimate operators, so that there could be a transi-
16 tion smeared out over a longer period of time.

17 There was another point I wanted to make about
18 that, but again, I think the other feature about it is
19 that many of the fellows involved in Unit 2 were inti-
20 mately involved in the design and construction and
21 startup of Unit 1, so they carried forth that piece of
22 experience, and we did have mechanisms -- again, I
23 can't be absolute about their degree of effectiveness --
24 but there were mechanisms for the sort of problems of
25 Unit 1 to be available, or for the progress managers

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2 for Unit 2 to be aware of Unit 1 problems, so as they
3 moved forward on Unit 2, to the extent possible, they
4 would try not to reproduce those problems or get
5 around those problems, to approach them, in, hopefully,
6 a better way.

7 (A brief recess was held.)

8 Q You indicated that one of the desires of
9 the Service Corporation -- and I believe you had
10 already implemented a plan to have certain operating
11 people come and be involved in the engineering end of
12 the operations.

13 A Sort of join the team of program managers.

14 Q How do you insure that the reverse is also
15 true, and the operators have enough of a basis or
16 understanding of exactly how the nuclear power plant
17 operates from an engineering standpoint as opposed to
18 an operating standpoint?

19 A Joan, I don't know that we had specifically
20 approached that question other than to feel that in
21 the course of meeting their license requirements, the
22 plant staff would have to have that requisite compe-
23 tence, and to the extent that that competence wasn't
24 there, we would get warning of that from observing
25 the various NRC inspection results and things of that

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Now, in some areas we were supplying analytical support to the operating companies, the dominant piece of that being in the core physics, core heat transfer, fuel management kinds of things, and I am sure we were also providing a degree of support in the licensing and environmental areas. I don't think in terms of any specific assessments that we made to say "Do you or do you not have the requisite technical skills."

From my point of view it was understood that the operating responsibility for the plant rested with the operating subsidiary and their vice-president of generation. I looked to the service company and vice-president of generation to be cognizant of the level of staffing, the degree of competence available within each of the operating company organizations. I couldn't say, though, that there were any objective measures that we applied or could have applied that said "You ought to have one heat transfer man, one safety analysis man, three this or four of that," or that kind of thing.

I did have a habit of having the NRC inspection reports distributed directly to me and even though I didn't particularly study them, I would try to find

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2 time to try and scan through them and observe whether
3 we were encountering areas of non-compliance.

4 I also felt that the activities of the GORB,
5 the General Office Review Board, was a mechanism for
6 gaining a sense of adequacy of the operating organi-
7 zation. I know that the GORB for Oyster Creek speci-
8 fically pursued the issue of technical and managerial
9 strength. I am not aware of a similar kind of assess-
10 ment or pursuit of the issue at Three Mile Island,
11 even though there were a number of common people on
12 the Oyster Creek and Three Mile Island GORBS.

13 Even though it is kind of a non-quantitative
14 thing, I also felt that the Management Review Committee
15 function at least provided me some degree of visi-
16 bility into the quality of staff, you know, not
17 certainly the details of the depth of people or their
18 detail knowledge, but one can gain a feeling or an
19 impression just from observing how an organization
20 responds in a briefing question and answer kind of
21 period, something of that sort.

22 But I think while there were mechanisms for
23 visibility and mechanisms for awareness or appraisal,
24 I would not have listed it as one of the responsi-
25 bilities of the service company to assess the adequacy

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2 of the operating company organization, even though
3 I am reasonably confident that if that organization
4 had been significantly inadequate our various mechanisms
5 for interaction would have brought that forward any
6 number of ways and frankly, I was of the view that
7 the Met Ed-Three Mile Island organization was a
8 competent group.

9 Q One of the things I think that has to be
10 realized since March 28 is that you cannot train an
11 operator on every expected transient.

12 A Every combination and permutation, yes.

13 Q Exactly.

14 How do you insure that an operator will
15 have enough knowledge of exercise judgment to assess
16 what is going on in that plant so that he can
17 adequately handle that situation that has not been
18 anticipated?

19 A Well, I think that goes beyond the question of
20 just operator training. Rightly or wrongly with
21 respect to operator training, I think that my percep-
22 tion or my feeling -- and I suspect of many organiza-
23 tions -- is that the NRC requirements were a reasonable
24 and proper prescription for the level of training and
25 the level of competence necessary. I don't say that

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2 it was their responsibility, I would just rather say
3 I made the assumption that rather than us or each
4 utility independently establishing some criteria, I
5 felt that the composite activity of the NRC seeing
6 all licensees and taking unto itself this role of
7 licensing would have properly prescribed.

8 But now to go beyond your question of how do
9 you make sure, I think one of the things to think
10 about is to back away from the concept of a very
11 sharp awareness of the so-called design basis accident,
12 to back away from a sharp focusing on specific big
13 events, major accidents that have been the design
14 basis, and to broaden this spectrum of awareness of
15 the multitude of combinations, permutations, and not
16 only that, but the kind of thing that some people will
17 describe as Murphy's Law, and that is evident, I
18 think, as people look back at many accidents, that
19 the reason they were accidents is because they didn't
20 go in the way you would have anticipated ahead of
21 time, that many times are compounded by a totally
22 unanticipated combination or sequence of events. So
23 I think by backing away from the sharp focus on big
24 deal accidents and giving everybody a broader sense,
25 then secondly to perhaps think less in terms of a

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2 specific response to each and every accident but
3 rather to think in terms of the minimum number of
4 fundamentally safe end points to go for, don't try
5 to decide whether this is the optimum response, go to
6 this mode almost irrespective because while it may
7 have some drawbacks from an optimization point of
8 view, in the long run you know that it is the funda-
9 mentally right mode or the right condition to
10 establish, and I think that could help the situation.

11 You know, let's take the Three Mile Island
12 accident, and I think, as your Commission has revealed,
13 the hangup on going solid when viewed coldly was
14 really not a proper choice between the lesser of evils,
15 that it was a much lesser evil to let the thing go
16 solid and to just keep pouring water than to prevent
17 the pouring of water to prevent the thing from going
18 solid. So that what I am saying is to let the minimum
19 of responses which tend to cover the waterfront but
20 may not be optimum for each and every situation
21 because I think if you try to be optimum for each and
22 every situation you set up the possibility of confusion
23 and hangups about which is the right way to go.

24 Then I think one of the things which is probably
25 inescapable as a lesson, and that we have reflected

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2 in our recommendations to the NRC, is that we are
3 going to need to put into place on all shifts an
4 individual or individuals that have a broader level
5 of technical training, more understanding of the
6 basic phenomena that are important to reactor safety
7 and core cooling and heat transfer and fluid flow,
8 so that in that residium of situations where the
9 signals are conflicting and where they may be uncer-
10 tainty as to what to do, that maybe this kind of
11 individual with this broader level of insight and
12 knowledge would be better able to size up the meaning
13 of these conflicting bits of information and arrive
14 at the right result, and again, I think that person,
15 to be effective, has to be on the scene at the plant.
16 He can't be at a telephone, he can't be X miles
17 removed, and we would like to hope that that kind of
18 a fellow is never called upon.

19 So I think that the challenge that this will
20 have to make this truly effective will be to give that
21 element, that new element to the staff some meaningful
22 responsibilities that keeps them continually involved
23 in the operations of the plant and the behavior of the
24 plant and its characteristics and its idiosyncracies,
25 its whatever, and my own view of a job of that sort

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2 is to have somebody do what perhaps is a word that
3 is used in a lot of areas, but operations analysis,
4 someone that is watching the behavior or the idio-
5 syncracies of the plant to try to deduce its inherent
6 weaknesses or strengths or characteristics and sort
7 of keep track of those so that incidents of potential
8 meaning with respect to safety have less of a prob-
9 ability of getting lost somewhere in the paperwork
10 shuffle of it all, that there is a specific activity
11 that is looking for occurrences that may have some
12 hidden meaning even though at the moment they seem
13 rather simple, but not just quite at the superficial
14 level of, "Oh, well, nothing really happens," or
15 "It is not that bad."

16 Q Do you think it would be beneficial to
17 have the control room operators, shift foremen, shift
18 supervisors have a Bachelor of Science degree or
19 equivalent to that?

20 A I am not sure that that would indeed be a
21 productive step, and I don't say that in the sense
22 that that level of knowledge could not be useful,
23 but I would rather say in the sense of could we main-
24 tain the alertness and the awareness and the challenge
25 to a person with that kind of training because ideally

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2 the frequency of problems should be such that perhaps
3 once or twice in his professional lifetime, if at all,
4 he would ever be called on for this kind of perform-
5 ance, and so I think one has to be sensitive to the
6 need to balance the people and their interests and
7 their motivations and their skills to the tasks at
8 hand while somehow then not being limited to just that
9 level of skill, having this reserve level of skill.
10 So that is why I think in terms of when we speak of
11 putting a trained technical person with a degree, an
12 engineering degree at the plant, I, as a companion,
13 corollary piece of that, have to think about how to
14 keep that man involved and knowledgeable and moti-
15 vated and interested, and so I think it would be too
16 easy to simply say that if we put a BS or a Ph.D guy
17 at the controls we would solve the problem. In fact,
18 it would be my own guess that they might be not as
19 good operators because, you know, their intellect
20 would be less satisfied with just the detailed, by
21 rote kind of level of knowledge and learning that we
22 expect operators to have. You know, I think a fellow
23 with more intellectual training and curiosity is less
24 happy just achieving a level of detailed knowledge of
25 systems. I think he is more interested in a continually
evolving challenge.

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So I don't want to be negative about the concept of having more skill available in the control room, but I think we have to be cognizant of how we maintain alertness on the part of that skill and how we match the requisite skills to the job so that we don't end up with another bunch of educated robots who really wouldn't be any better, might not be as good.

Q You have mentioned various NRC standards with respect to the qualifications of operators?

A Yes.

Q Also in the design and construction of a nuclear power plant?

A Yes.

Q How are these standards referred to, are these a minimum that is met?

A I don't know that I would look upon it that way. I think they are perceived as a definition of an adequate design basis with conscious levels of theoretical or philosophical margin contained within them to do the job.

So, if I could look beyond your question a little bit and say, well, does one perceive of those as just the minimum that you try to skate

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2 by with?

3 I don't think we have an attitude that
4 is any way manifested in that regard. I think
5 we rather feel that they constitute a meaningful
6 and adequate set of conditions, that if we meet
7 those, we will have done the job and I think it would
8 be somewhat simplistic to assume that someone could
9 just kind of, on his own some where say, "Well,
10 gee, that is an inadequate standard. I am going
11 to do a heck of a lot better than that because I
12 know those guys aren't smart enough to know how
13 to do this right."

14 I think that would be some form of
15 sophistry that wouldn't make a whole lot of sense.

16 Now, I think there are many times and
17 many occasions when you can look at the situation and
18 say, "Look, our own experience, our own practice,
19 our own experience with maintenance or our own
20 experience with reliability of components and the
21 like says to us that probably we ought to do it
22 a little bit different than what the minimum
23 standard requires," and we will go ahead and do
24 that, because we think it is in our own best
25 interests to design the plant that way.

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But I guess I don't conceive of standards either describing the minimum level of thin ice that you can skate by with, and I also don't conceive of our own approach towards those standards as sort of saying, "Well, gee, goody, goody, we just got through that one by a hair and therefore we are okay."

I think our people, whether it is our people or the architect-engineer's people or the nuclear steam supplier's people also have an awareness most of the time of the intent or the philosophical basis, the design basis for some of those standards and recognize what is needed.

But, again, I would want to be careful about just saying, "Well, gee, if it calls for redundant, anybody knows that by putting in three, it is going to be better instead of just two."

Well, I don't think that is right, because I also feel that one of the things that potentially militates against safety is complexity and, you know, given my choice, if I were to redesign the standards -- and I'm just saying this now philosophically -- I sense that the standards have been something that have developed over a period

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2 of time by incremental modifications or decisions
3 here and there and that it would be very beneficial
4 if someone could stand back and say, "Stop a minute.
5 Let's reestablish the laundry list of specific
6 priority of fundamental things that we want to
7 achieve, and now address ourselves and do our
8 criteria, our 70 design criteria or however many
9 there are, do they indeed satisfy those priority
10 objectives with a minimum of complexity, a minimum
11 of pieces and parts and claptrap and controls and
12 active components that depend upon everything working?"

13 I think you could probably gain something
14 on safety, if you did that, but I guess I really
15 don't relate to the concept of either finding
16 extreme satisfaction of just getting by by a
17 hair's breath, or of somehow feeling that we have
18 some superior knowledge that tells us how to double
19 up on a given criteria, thus do better.

20 So I would think we accept them as
21 a valid basis.

22 Q The existing structure of Metropolitan
23 Edison has engineering or technical support at
24 Three Mile Island. In addition, there is an
25 engineering staff in Reading at the corporate

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level. And there is a separate engineering staff within GPU Service Corporation.

A Yes.

Q Why is there this existing condition on two corporate levels and then on-site?

A Well, first of all, in its simplest sense, the Met Ed organization is intended or construed or authorized to be self-sufficient in terms of the spectrum and number of skills that they need to discharge their responsibilities.

Recognizing that, that skill level is augmented by outside consultants, architect-engineers, the nuclear steam suppliers and the like. Beyond that, then, there tends to be a geographic split within Met Ed, and I think we should identify it only as a geographic split between Three Mile Island and Reading; it all reports to the same man, or at the time of the accident it all reported to Jack Herbein. Within the Engineering Division there are other things called engineering associated with the transmission and distribution function, but having to do with generation. So the geographic split then comes in the course of assigning to the plant and its geographic environments those people and

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that spectrum of skills that are expected to be needed on a very intimate, routine, day-to-day, hour-to-hour, direct support of the operations of the plant, and those kinds of skills which are perhaps more broadly applicable to not just the nuclear plant, but also the coal fired, are put into the neutral location of Reading.

Perhaps a good example of that is some of the environmental affairs and licensing types of activities, that don't really need an intimate, day-to-day, on-site presence, but can do their job from Reading and also can work on, let's say, environmental problems, whether they are on the Portland coal fired plant or at Titus or at Three Mile Island, whether it is putting a cooling tower at the Titus plant, some engineering support for that kind of thing, and the like.

Now, there may be elements of that geographic split that don't quite fit my exact description. There may be some that just relate to the pragmatic aspects if a guy is living in Reading and his presence at the site doesn't seem to be enough to ask him to move or he hasn't moved yet or things of that sort.

But in general, I think our approach and our philosophy is to say that the operating organization should have enough technical engineering, scientific, whatever the skill is necessary to support its day-to-day obligations, again, recognizing that there is a choice that could be made now between what fraction of that is inside within the company and what fraction is drawn on from a consultant, and that relates to a degree then to your perception of the degree to which you need a given skill on a full time basis, the degree to which you can attract people in a given area of expertise, the degree to which, you know, you can really maintain an effective organization or also the degree to which it is beneficial to have somebody who plugs into another organization with added strengths.

So that is why I say I don't think you ever think in terms of operating a Three Mile Island completely in a closed bottle all on your own, because you do want access to other than that.

Now, moving to the service company, that engineering organization in the past was dominantly dedicated to supporting the management

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2 of the design and construction of the new plants,
3 and again we aggregated that into one common
4 organization in the service company, because
5 we did not feel that we could attract a critical
6 mass of skills that go beyond simple technical and
7 engineering skills, but include the very definite
8 skills of program management, that we could not
9 produce that two or three times over by having
10 that capability in each operating company, and
11, secondly, that the work load was such that you
12 could build up an organization then not be building
13 something for several years and not need that
14 organization where by gathering together the work
15 load at the service company's centralized service
16 kind of function we could maintain staff continuity,
17 we could better afford to attract and maintain the
18 spectrum of skills.

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You know, it is one thing to say you need
a spectrum of skills, it is another thing also to
say that you have got a work environment and work
objectives that sufficiently challenge people that
they stay with the organization and identify with
it, and so in a sense, in a simplistic sense, the
service company and the design and construction of

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new plants was, in the past, partially decoupled from the operations, or at least significantly decoupled, and each was felt at least to be somewhat on its own, and in the last couple of years and into the future we were moving in the direction of establishing a stronger coupling by saying to the operating companies the following: "We will consciously build a greater level of engineering capability service company so that you can call upon that engineering capability to assist you, not only in some of your day-to-day operating problems, retrofits to the plant, environmental modifications, new licensing modifications, or things of that sort, and call on the service company engineering organization; don't call on an outside consultant," and in turn saying to the service company organization: "When the operating company calls upon you, it is your responsibility to provide them net product and service and not just to be an over the shoulder comentator or consultant."

And then it was our feeling that by means of that serving relationship back and forth we would also build into that service company

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2 engineering organization a better sense of
3 values for making the judgment about the con-
4 struction and management of the new plants that
5 were being built, at all times recognizing that
6 we never had an intention of shipping the technical
7 or engineering skills out of the operating company,
8 because we always felt that they needed a significant
9 level of that right at their immediate, direct,
10 first-hand beck and call to serve their needs,
11 but rather that the service company could gain
12 involvement in the operating plants largely by
13 displacing work or taking on work that otherwise
14 would have to go to outside organizations, outside
15 architect-engineers, or consultants.

16 So I think that the rationale has some
17 sense to it and I would go on to say to you that
18 if you were to take all of the GPU nuclear plants
19 and throw them together in to one organization and
20 forget about Jersey Central, Met Ed, and the
21 service company, you would still end up with a con-
22 figuration that would not be terribly different
23 in concept.

24 You would still end up, I think, with
25 each plant, from an operating point of view, each

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2 operating plant having its own integral elements
3 of engineering capability and support, you would
4 end up with a separate entity in charge of design
5 and construction of new plants as contrasted with
6 operation of existing plants, and you undoubtedly,
7 I think, end up with a degree of centralized engineer-
8 ing capability that assisted the operating plants
9 on tasks of a longer term nature, modifications,
10 retrofits, solutions of long-term problems rather
11 than the day-to-day problems, and that engineering
12 organization also providing the engineering backup
13 skill to the program managers for the new plant.

14 So I think that the only real difference
15 is that the same entities now are distributed
16 under three different managements rather than
17 having one current management.

18 Now, along that line, we have, I think --
19 you started to say, "Well, what difference does
20 that do?" Well, there is both good and bad
21 aspects of having one common management. I mean,
22 you have got one central point of view and central
23 approach, you don't have a diversity approach,
24 but on the other hand, you can have a single-
25 mindedness, a dedication, a centralization of

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2 competence and skill in the nuclear area within a
3 central organization, but ultimately it gets
4 down to people and people mobility, and one
5 of the things we have been doing within the GPU
6 System over the last several years, is trying to
7 break down the barriers that prevent people mobility
8 within the system and try to encourage transfers
9 of people between these various functions, because
10 I think ultimately it is the people and the movement
11 of the people back and forth that leads to the
12 transfer of experience and information and
13 approach.

14 So while we, as I say, I think when
15 you look at what we have versus what one might
16 construct as potentially an ideal approach, you
17 would have the same fundamental entities, you would
18 still have largely a similar degree of geographic
19 dispersion. The only difference you would have
20 would be perhaps a common reporting level, and
21 from that, depending upon the individual, it would
22 or would not be better.

23 Q As the organizations exist now or prior
24 to March 23 as they existed, as I understand it,
25 there was a very close relationship and interaction

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2 between the vice president of Generation for
3 Metropolitan Edison and the vice president of
4 Generation for the Service Corporation.

5 A Specifically you mean Herbein and Arnold?

6 Q Correct.

7 A Yes.

8 Q And their respective organizations?

9 A Yes.

10 Q Was this true for Jersey Central and
11 Penn Elec also?

12 A Well, I think that is one of the things
13 where you get down to people and where you get
14 down to the management approach to people. The
15 relationship between Jack Herbein and Bob Arnold
16 was a very complementary, supportive type of
17 relationship because they had worked together
18 at Met Ed, so they established a mutual respect
19 a rapport and the like, which allowed them and
20 encouraged them to work very closely.

21 Any time you have got individual elements
22 of an organization, absent some specific person-
23 to-person relationship, there is a tendency for
24 that element of the organization to want to be
25 self-sufficient. I think each of us wants to

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2 be self-sufficient, each of us is always reluctant
3 to admit that we want to turn to somebody else for
4 some assistance.

5 So I think, in a sense, the relationship
6 specifically between Bob Arnold and the fellows
7 of Jersey Central and Penn Elec would not have
8 the same effect as the relationship with Jack
9 Herbein. However, we made several organizational
10 moves with those very basic recognitions or facts
11 of life in mind.

12 When it came time to appoint a new presi-
13 dent for the Penn Elec Company, we chose Bill Verrochi
14 who was Bob Arnold's predecessor in Design and
15 Construction at the service company.

16 When Bill Verrochi goes to Penn Elec
17 as president of Penn Elec, Bill Verrochi carries
18 with him a knowledge of the rationale, the
19 purpose, the intent, the capabilities of the service
20 company and is able then to say to his people,
21 "Use that capability within GPU; don't try to
22 be totally independent of it."

23 Likewise, when we chose a man to replace
24 Bill Verrochi, we said one of the things we ought
25 to do is not put into that job some outside guy

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2 from an architect-engineering firm or a construction
3 firm who was a wizzard at engineering or construction,
4 let's bring in an guy with operating company
5 experience so that that design and construction
6 activity will have an increased awareness and
7 sensitivity to the approach, attitudes, and problems
8 of an operating company.

9 So we chose Bob Arnold from Met Ed
10 to come into the service company.

11 We haven't gotten to the point of a
12 shuffle with Jersey that would facilitate some
13 of the people-to-people relationships, but I guess
14 the point that I am trying to make is that there
15 are practical facts of life here, and I think we
16 tried to recognize those and deal with those in
17 a very conscious way and try to improve the
18 interrelationship between the service company
19 and the operating companies, and thus the effective-
20 ness of the total structure.

21 Again, it remains to be seen how that --
22 it will always remain to be seen how that kind of
23 thing ultimately works out, but I think we had
24 a definitive rationale for it.

25 At the same time, let me just add that

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2 when we were faced with the stress of the challenge
3 for people and skill after the accident, we were
4 able to draw on both Jersey Central and Penn
5 Elec for people to move into the operation and to
6 provide assistance both in breadth and depth.

7 Q How are you kept informed of day-to-day
8 operations within the operating companies?

9 A Well, the way, you know, the pattern of
10 management style or whatever it is that you want
11 to talk about, the way we work is that the operating
12 company presidents, in effect, report directly
13 to the chairman of the board, my boss. We don't
14 construe it as their reporting through me to him.
15 They report directly to the chairman of the board.
16 He in turn, is chairman of the board of each of
17 the subsidiaries, so that is a natural relationship.

18 I maintain an awareness of what happens
19 in the operating companies by looking to the
20 functional vice presidents of the service company,
21 and having charged them with responsibility to
22 be the internal coordinator, the father confessor
23 of their like counterparts in the operating com-
24 panies, whether it is transmission distribution,
25 financial, generation, or the like.

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2 So when I want to know something about
3 what is going on in a given area, I most of the
4 time will turn to that functional vice president
5 of that area in the service company and ask him
6 about it or say to him, "Is this an area we ought
7 to evaluate or look at, and how to do this or what
8 should we be doing organizationally, what seems to
9 be the problem," things of that sort.

10 In addition to that, of course, there
11 are just a number of internal communications within
12 the organization that always flow up. There are
13 monthly reports that relate to subjects, both
14 operating and maintenance, and capital for con-
15 struction.

16 There are reports that are generated
17 that maintain a running account of the operating
18 reliability or capacity factors of the power plants.

19 The reports contain the generation
20 results, the m.e. of data. We have a monthly Service
21 Company Board Meeting that has presidents of the
22 operating subsidiaries present and we'll review
23 the operational results with them on a monthly
24 basis. Just a wide variety of these kinds of
25 things, but I think it's just talk about the

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2 details of how it works in the subsidiaries, the
3 president reports to the chairman, I sort of act
4 as the chairman's chief staff guide, and I have
5 a group of functional vice presidents who then
6 work cross-ways with their counterparts in each
7 of the subsidiaries.

8 But I don't attempt to, you know,
9 manage the day-to-day activities of the subsidiaries.
10 I think we encourage the subsidiaries to manage
11 their own affairs, to, you know, maintain their
12 responsibility for their operations.

13 Q You set up, I believe in 1975, a
14 Nuclear Management Review Board?

15 A Yes.

16 Q Why did you feel a need to establish that
17 board?

18 A I think the need was several-fold. I felt
19 that by sort of setting for ourselves an objective
20 of visiting each plant once a year, we would
21 maintain a degree of awareness, of what was
22 happening at the plant, an additional source of
23 awareness. We would provide an opportunity for
24 how things looked. You know housekeeping can be
25 a measure of helping us. We can provide ourselves

1
2 a visibility into the staff both ways, so we could
3 see them and how they acted and were able to talk
4 about their operations and explain it, and likewise,
5 we could provide a vehicle for the plant level of
6 people to speak directly to the high levels of
7 management in the company and express their views
8 and their concerns and summarize the problems as
9 they saw them from the plant point of view.

10 I did not construe it as an integral
11 part of the management of the operation. I rather
12 construed it as a way to maintain a level of
13 awareness, to reflect to the operating staffs a
14 management interest in what was going on and to
15 provide them a mechanism for saying something
16 to management about the problems as they saw them.
17 And I think that was pretty much the thinking
18 involved, and unless you set for yourself an objective
19 of doing something like that, there is always the
20 press of business. So for doing something like
21 that -- and if you look at the schedule of visits,
22 they often times get juggled, they don't happen
23 on a perfectly routine basis, but we have tried to
24 do it.

25 Q What functions did you envision or did

1
2 the Nuclear Management Review GORB have as
3 distinguished from the Board?

4 A Oh, I think that is a very definitive dif-
5 ference. I think the GORB is a group of experienced,
6 skilled, competent, largely outside in terms
7 of specific direct-line responsibility for the
8 plant review and assesement of manning or technical
9 safety issues, and so I think that is a far
10 different function with far more tight coupling
11 into the specifics of the mechanisms for safety
12 than what we call the Management Review Committee
13 or whatever we call it -- I don't even know what
14 the exact title is -- but a very sharp distinction
15 in my mind in terms of what they do.

16 Now, the GORB meets monthly, and it is
17 made up of ten members and generally with one or
18 two exceptions, they are people not directly in the
19 line organization for that plant, and their purpose
20 is to specifically review safety related issues, in-
21 cluding organization as a safety related issue.

22 Q And you envision the purpose of the
23 Nuclear Management Review Board as a vehicle for
24 exchange between the plant staff and management?

25 A As much as anything else a way for me

1
2 to maintain, you know, a direct visibility of
3 what was happening and a channel of communications,
4 and I think when you look at the charter, it sort
5 of specifies that we should always have a tour
6 of the plant, there are certain areas that we want
7 to hear about, about the results of the NRC
8 inspections, about the results of the Health Physics
9 Program, the radiation exposure to personnel,
10 personnel problems, just a general review of
11 operations and the problems. And I think when
12 you also look at either some of the prepared material
13 or the after-the-fact brief minutes, you will
14 find that personnel problems were many times a
15 prominent aspect of that whole discussion, you
16 know, the challenge of how do we attract and
17 maintain qualified competent people to meet the
18 demanding requirements of the nuclear plant,
19 how do we try to recognize the compensation
20 requirements to attract and maintain that staff
21 while not getting things excessively out of line
22 with other functions of the organization, and
23 these have been areas of frustration and
24 difficulty; I guess always have been. Each ele-
25 ment of the organization wants to think it is

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2 special, and perhaps the Nuclear Group is a little
3 more special than other special ones, so it has
4 to be a source of continued discussion.

5 Q Was there a similar board set up with
6 respect to the fossil fuel generation plants?

7 A- No.

8 Q Why did you feel a particular need to
9 have this Review Board for the nuclear plants?

10 A Well, I guess I would have to say that I
11 have always been, you know, clearly aware of the
12 differential between the nuclear plants and the fos-
13 sil plants in terms of the safety demands, the
14 need for some kind of managerial and technical
15 excellence and the need to establish and maintain
16 a rapport with the plant people to minimize the
17 probability of finding ourselves with an estranged,
18 disgruntled group who felt that they weren't being
19 recognized, that there were problems that somehow
20 couldn't percolate through some internal structures
21 to higher levels of management where they could
22 be cut through and dealt with.

23 There is no question in my mind of the
24 difference in obligation and importance. I wouldn't
25 want to say that in a way that suggests the fossil

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2 plants are absolute second class citizens, but still
3 I think it is just a recognition of the importance
4 of nuclear operations.

5 Q Looking now at what we have already
6 marked as Finrock Exhibit 11.-- I believe it is
7 a prepared document prior to the January 18, 1979
8 meeting of the Nuclear Management Review Committee.
9 Do you remember attending?

10 A I certainly do.

11 Q Were the concerns of the issues raised
12 at that meeting indicative or representative of
13 a Nuclear Management Review Board Meeting?

14 A Yes, I think so. I think while this document,
15 many people relate to the specific language that
16 Gary Miller used in describing some of his
17 problems or frustrations, the scope of the meeting
18 was not unlike other meetings associated with
19 TMI 1 or Oyster Creek. Yes, it did have a dis-
20 cussion by Dick Dubiel about Health Physics. I
21 think Sandy Lawyer covered NRC relationships.

22 I think there is a fellow that
23 stands out in my mind who talked about the occupa-
24 tional safety program at the plant. There certainly
25 was the discussion by Gary that related to his

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concerns about the level and energeticness, I
guess, of support that he felt he was getting or not
getting from the home office staff in terms of
acquiring people and the sensitivity to the needs
to recognize the kind of extraordinary overtime
demands that were routinely placed on the nuclear
plant staff, and the inadequate housing facilities --
and let me tell you I have not reviewed that
document since the meeting, so you know the
meeting is etched in my memory and I think I
would have no trouble characterizing it as not
having been atypical.

(Continued on the next page.)

Q What response was there to Gary Miller's

concerns?

A One specific response that I remember sharply was saying to Creitz that we should go ahead with the planning necessary to put in place an office building or office structure so that we could provide a decent or pleasant working environment for the people that, you know, kind of -- at least we had recognized -- that with the demand on these guys, that we shouldn't burden them further with lousy working conditions -- all the trailers that you are familiar with, and for which the fellows at the plant had a certain fond expression -- and I think there was routinely -- at this point I am fuzzy -- there was routinely discussion about the need to recognize the turnover that we were experiencing and not let the hiring or people-acquisition problem be bogged down by the details of personnel requisitions and all the various controls that we had in place to put a constraint on personnel levels throughout the organization, but rather to recognize that there was going to be a certain level of turnover, and there were certain gross requirements, and just aggressively try to recruit X people per year or some approach of

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2 that sort, so as to maintain new blood, new people,
3 new styles coming into the pipeline, rather than
4 waiting until the situation presented itself and
5 then saying, "Oh, my God, we have got to do something!"
6 and go out and hire people. I think that was one of
7 the key items.

8 We had many discussions -- I am probably now
9 fuzzy between Three Mile versus Oyster Creek -- about
10 the importance of recognizing overtime and shift
11 differentials, and differentials or compensation to
12 recognize the personal time that operators in particular
13 would put in to maintain the currency of their license
14 and things of that sort, and, you know, I guess my
15 role generally was to encourage Creitz to instruct
16 his personnel and administrative people to recognize
17 the need to support Three Mile Island with these
18 kinds of activities and not let it be bogged down
19 with the administrative details that were more
20 acceptable for some other, less demanding functions
21 of the company that, you know, was requiring less
22 overtime, not requiring shift work, not, you know,
23 being as demanding in terms of having a full comple-
24 ment of skills.

25 Q With respect to concerns raised at a

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2 Nuclear Management Review Board meeting such as the
3 January 1979 one concerning Unit 2, who would be
4 vested with the responsibility of analyzing those
5 concerns, determining whether or how they should
6 be resolved, and then implementing those solutions?
7 Would that rest with the Service Corporation?

8 A No. As far as I was concerned, the resolution
9 of those matters, particularly the ones that related
10 to staffing or training or pay scales or shift
11 differentials, those all resided specifically with
12 the operating company responsible for that plant, and
13 as far as I was concerned, it was their responsibility
14 to do their best to manage those problems. And the
15 purpose of those meetings was to highlight or make
16 those concerns of the plant known and to provide an
17 opportunity for me to express to the operating
18 company president my own reaction to those concerns
19 and any attitude or preference or management view
20 that I might have about them.

21 Now, some of these things -- and also, this
22 would trickle through when it would come time for
23 overall budget review, either at the O&M level or
24 at the construction level -- for example, let's say
25 providing an office building or, for example, in

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2 terms of compensation for senior personnel, we did
3 and we do have in place a cross-system salary review
4 approach for people above a certain salary grade for
5 the purpose of making sure that we treated like
6 functions similarly across the system, and we have
7 been working for some time to sort of upgrade the
8 recognition and, in turn, the compensation for the
9 fellows that carried the day-to-day responsibility
10 for the operating nuclear plants, and again, that
11 is an area where I would sort of carry something home
12 and do something about it when the occasion
13 presented itself.

14 Q You indicated that one of the services
15 that the Service Corporation provides to the operating
16 companies concerns finances or formulation --

17 A Financing, yes.

18 Q Such as the construction of an office
19 building on Three Mile Island Unit 2; that would be
20 the responsibility of the Service Corporation?

21 A Well, only in the sense of recognizing it as
22 part of an approved construction budget for the
23 operating subsidiary. Beyond that, the Service
24 Company and the people in my level would not have
25 been particularly concerned about the details of

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how that facility was put in place.

I think the thing that you have to recognize relative to the Service Company role there is that the major problem and a major demand for a utility system is the continued requirement to attract new outside capital. That new outside capital is required to serve the customers in the future.

In general, we require new capital for construction that is at least equal to and sometimes greater than the amount of internal cash generated from the operations, so in the typical year and in the ensuing years, we would have been going to the external capital markets for \$200 and \$300 million a year of new capital.

In order to be able to place that capital, to sell the bonds or to sell the necessary common stock equity to preserve a proper ratio of securities, capital ratio, capitalization ratios, the company and its subsidiaries have to have a degree of creditworthiness. Creditworthiness really means earnings because earnings are the cushion that provide security for the bondholders and things of that sort.

In terms of managing the utility, one of the dominant considerations is to strike a balance between

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2 the operating and maintenance expenses which impact
3 earnings directly and thus impact the ability to
4 attract and to bring in outside capital versus the
5 amount of capital that is needed to sustain the future
6 obligations of the company, so in that respect, then,
7 the prioritization of capital projects, the new
8 generating stations, the environmental modifications
9 to new generating stations, retrofits for reliability
10 or regulatory requirements of the nuclear plant, or
11 what have you, transmission and distribution, and then
12 finally just other kinds of capital structures like
13 office buildings, so there is a need to prioritize
14 that capital budget so that that appetite is consistent
15 with your ability to provide the capital, and at the
16 same time, that couples back to the ability of the
17 company to provide the creditworthiness so that that
18 capital can be attracted, and that is a continuing
19 sort of major top-level demand of utility management:
20 to strike that balance.

21 Q The Service Corporation also has final
22 review over the operating and maintenance budgets of
23 the utilities?

24 A I don't know whether I would have said "final
25 review." The Service Company plays a role, plays a

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2 corporate staff role in that. The Service Company
3 functional vice-presidents, for example, are the
4 fellows who, within the system of this cross-system
5 visibility, are in a position to compare the needs
6 of Company A with Company B to try to ensure that
7 this prioritization of spending or prioritization of
8 investment is similarly pursued in each of the
9 individual operating companies, and when it comes
10 tim to tighten the belt, they also are the fellows
11 who have the visibility as to where there might be
12 some opportunities for savings, or conversely, if they
13 see areas where the budgeting is not appropriate for
14 doing the job, they are in a position also to make
15 the recommendations as to how to make those adjust-
16 ments or how big those adjustments ought to be. So
17 they really are a staff review, and then ultimately
18 it comes dow, I think, to myself and the chairman and
19 the operating company presidents, and that operating
20 company's board of directors to set a budget for that
21 subsidiary.

22 Q With respect to the operating and main-
23 tenance budget concerning Metropolitan Edison Generation
24 Division, how does the Service Corporation set certain
25 priorities within that budget?

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2 A I don't think the Service Company entered that
3 budget at the operating and maintenance level at a
4 very detailed level. I think the Service Company
5 probably spent more effort, exerted more effort on
6 the prioritization of the capital items.

7 I think when you got down to the internal budgets
8 of the various divisions within Metropolitan Edison,
9 certainly we were cognizant of the generation budget,
10 the nuclear portion of the generation budget and the
11 like, and I think that if on occasion we felt that,
12 let's say, there was a need to hold the line at a
13 certain dollar level or the need to trim a certain
14 amount, we would look dominantly to the operating
15 company management to apportion that, you know,
16 prioritize that spending, and to arrive at what they
17 felt was the optimum distribution, and if anything,
18 I think the Service Company probably acted, too, as
19 a patron for the nuclear budget to make sure that
20 they weren't excessively the source of money-cutting,
21 and the reason for that is because they were routinely
22 the source of the major increases, and so, you know,
23 if you just look at the total management spectrum in
24 the operating company, everybody would look at them
25 with jaundiced eyes and say, "How come I am getting

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PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

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DEPOSITION of GENERAL PUBLIC UTILITY SERVICE
CORPORATION by HERMAN MAIER DIECKAMP, held at the
offices of Shaw, Pittman, Potts & Trowbridge,
Esqs., 1800 M Street, NW, Washington, D.C. 20036,
on the 15th day of August 1979, commencing at
8:35 a.m., before Stephen McCrystal, Notary Public
of the State of New York.

BENJAMIN REPORTING SERVICE
CERTIFIED SHORTHAND REPORTERS
FIVE BEEKMAN STREET
NEW YORK, NEW YORK 10038

[212] 374-1138

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2 cut, and you are spending all this money?"

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4 But I think in trying to leaven that situation
5 and try to balance it, if anything, we tried to keep
6 those budgets up even though I think we were very
7 conscious of the very sizeable operating and main-
8 tenance budgets going into the nuclear plants, and
9 we were looking for ways to evaluate those budgets
10 both on an internal basis and on an external basis
11 for comparison purposes to attempt to find some basis
12 for judgment as to whether the requirements were
13 truly valid or whether there were indeed opportunities
14 for some savings, and I think that after all these
15 kinds of studies and efforts that were put into those
16 kinds of assessments, we never were able to really come
17 up with hard analysis that said we ought to get
18 down to the same spending as Company Z.

19

20 We rather recognized, I think, that our plants
21 had a very good record in terms of capacity factor,
22 and to the extent that our willingness to spend the
23 operating and maintenance monies contributed to the
24 achievement of those capacity factors, we felt that
25 it was a good and proper expenditure and investment.

26

27 You know, I must say that we were never able
28 to prove to ourselves that there was a one-to-one

2 correlation between that spending and the capacity
3 factors of the plants, but on the other hand, we didn't
4 perceive it as being in our best interest to cut those
5 budgets back excessively, and again, it is very
6 difficult to arrive at absolute measures of what is
7 the right amount, and for that reason we sought to
8 correlate our expenditure experience with the same
9 experience of others, and even though one has the
10 commonality of the FPC or the FERC accounting system
11 and the Form Something-or-other reports, there are
12 another variations in accounting procedures and
13 definitions that you are never quite sure about the
14 comparability of the numbers.

15 So we, as I said, I think in general ended up
16 with ample to generous budgets for the nuclear
17 operations.

18 Q During the fiscal year, was there con-
19 tinual review of a budget?

20 A Occasionally there would be, and I guess I am
21 not quite sure how occasional is "occasional," but if,
22 for example, we were to encounter problems with a
23 significant delay in a rate application or some other
24 kind of untoward incident that required a reapportion-
25 ment of the distribution of the budget, that required

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2 some need to modify the budget, those kinds of reviews
3 would occur.

4 From my point of view, I think that is a normal
5 and natural process of managing an enterprise of this
6 size, and it is especially difficult, again, when
7 one recognizes that if you allow unrestrained spending
8 to destroy the earnings posture of the company, you
9 are not simply impacting investors or stockholders;
10 what you are doing is you are impacting the ability
11 to acquire new capital to serve to build the facilities
12 needed in the future.

13 So again, it is a delicate balancing kind of
14 thing to maintain the total enterprise and move
15 towards the objective that needs to be reached. So I
16 couldn't say to you that there were never any occasions
17 when we did not have some mid-year or interim kind
18 of a review that said, "Gee, fellows, we had better
19 hold the line; we had better see what we can do to
20 control this expense or modify our approach here or
21 there to keep the expenses down."

22 I think if you look at those kinds of things
23 historically, the place where they have had the biggest
24 impact has probably been in things like the tree-
25 trimming program which tends to be an incremental

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2 kind of an outside contract expense that can be modu-
3 lated to adjust expenses during a year. At the same
4 time, you are always faced with unanticipated
5 expenses from storms or other problems of that sort.
6 Beyond that, I think we would generally turn to the
7 operating companies and say, "Look, you fellows know
8 best how to adjust your internal budgeting in order
9 to try to achieve a given target."

10 Q But usually if during the year an increase
11 of expenditures was required outside that initial
12 budget, that would go back through the review process
13 within the Service Corporation?

14 A Not necessarily within the Service Corporation.
15 That kind of a thing could be handled at the subsidiary
16 and subsidiary board level. If anything, I think we
17 had occurrences where expenditures were committed and
18 undertaken without formal approval to the extent that
19 the Service Company was involved. I think occasions
20 when there was a need to look not at an individual
21 subsidiary because of its problems, but because of an
22 across-the-board requirement, and the role of the
23 Service Company really being to try to see if we were
24 applying the constraints sort of equally in terms
25 of priorities and bases for priorities and things

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across the company.

Q Between or among Penn Electric, Jersey
Central --

A Right.

(Whereupon, at 12:00 noon, a luncheon
recess was taken.)

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m:lc

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AFTERNOON SESSION

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1:30 P.M. Resumed

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H E R M A N M A I E R D I E C K A M P ,

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having been previously sworn, resumed the stand

6

and testified further as follows:

7

DIRECT EXAMINATION (Continued)

8

BY MS. GOLDFRANK:

9

Q When you came to GPU in 1973, you indi-

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cated that construction for Unit 2 had already

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commenced.

12

A Yes, by quite a bit of time. It was well

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under way.

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Q At that time, you were aware that the

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original design for Unit 2 was drawn up for a second

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unit at Oyster Creek?

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A Yes.

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Q Did you become aware of certain factors

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that went into the decision to transfer that design?

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A I think over a period of time I became aware

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of some of those factors; none of them seemed

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particularly pertinent to the ongoing thing, so I

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have never been terribly curious about it myself

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in terms of really digging back on it, but it is

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true that the plant was originally conceived as being

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2 built adjacent to Oyster Creek and being operated by
3 Jersey Central. That probably contributed largely
4 to the choice of Burns & Roe as the architect-
5 engineer for that plant, and sometime before the
6 construction really got under way, the decision was
7 made to relocate the site to Three Mile Island.

8 Q What were some of those factors that went
9 into that decision to relocate?

10 A Well, I think, you know, as I understand it --
11 again, I am strictly on the hearsay basis of not
12 having, myself, bothered to look into it in detail --
13 that as a hangover or residual from the Oyster Creek
14 construction, the labor unions and some of the un-
15 desirable factions of the labor unions were very
16 strongly entrenched in the shore area, and there
17 were very direct and overt overtures to the company
18 to, in effect, demand payment for labor peace and
19 things of that sort, and, you know, on these kinds
20 of construction projects, the labor happiness,
21 tranquillity, peace -- whatever you want to call it --
22 can be a very significant factor in the ultimate
23 cost and schedule and effectiveness of the project,
24 and I think the company felt that in no way were they
25 willing to be subject to that kind of continuing

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2 blackmail, and the best way to escape that was to move
3 the plant in the early time period when there was
4 still a lot of freedom; they weren't locked in by
5 having a lot of expenditure and commitment in place
6 that would have to be abandoned; so the decision was
7 made to move it.

8 Now, I am sure there may have well been some
9 other considerations that I am less aware of, but
10 it is my understanding that the prospects for
11 reasonable labor relations and the absence of threats
12 of blackmail and violence were a significant factor
13 that led to that decision.

14 Q How close is Forked River to Oyster Creek?

15 A Oh, it is within eyesight. I think it is
16 probably a couple of thousand feet away.

17 Q So that the initial concerns that prompted
18 the transfer of the original design for Oyster Creek
19 to Three Mile Island Unit 2 did not, at a future date,
20 prevent GPU from --

21 A Well, there was time for that situation to
22 cool off, time for some individuals to go to jail,
23 a few things of that sort that I think led to the
24 feeling that the labor situation was acceptable,
25 even though, you know, it continues always to be a

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2 matter of concern as to the manner in which some kind
3 of organized crime activities can infiltrate a massive
4 effort the size of building a nuclear power plant.

5 You know, when you have a couple of those
6 construction workers on the site, you have oppor-
7 tunities for all kinds of things, and it is a difficult
8 challenge to try to make sure that that job just
9 doesn't become a happy hunting ground for some of
10 those unsavory activities.

11 Q When it was decided that for Unit 2 the
12 NSSS supplier would be B&W, what did B&W inform you
13 as to the kind of training that would be needed with
14 respect to that particular supply system? Was there a
15 distinction made between that supply system and the
16 one that was already in Unit 1?

17 A Joan, I was not on the scene at that time, and
18 I have no awareness of any discussions, you know,
19 either positive or negative, one way or the other,
20 about that feature of the Unit 2 supply arrangement
21 or the relationships with B&W, and I guess during
22 my tenure, I have not sought or had an opportunity
23 to see any record of any differences that were brought
24 to our attention, and again, that doesn't mean that
25 they were or were not; it is just that I have not

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2 looked into that matter.

3 Q Could you explain what it means to have
4 a nuclear plant declared commercial?

5 A Yes. It goes back to FPC and FERC accounting,
6 and it means a number of things in a number of senses.

7 One thing that it means, which is a less im-
8 portant thing, but one thing that it means within
9 the PJM families of companies that form that pool is
10 that when we declare a plant commercial, it is made
11 available to the system dispatchers to call upon that
12 plant for generation when it is needed. So it is,
13 in effect, officially made available to provide power
14 to the pool, but that is -- I don't know -- not a
15 terribly significant thing.

16 The more critical feature relates to the FPC
17 accounting rules, which I think needs to be there, is, as
18 I was saying, that while I am sure that there is an un-
19 derlying presumption that "commercial" means that the
20 plant has reached some degree of dependability relative
21 to usefulness and power output and availability and
22 reliability. There are no criteria along that line
23 that, to my knowledge, are articulated or are
24 available or established by the FPC. The only
25 evidence of a rule or regulation says that in the

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2 event that 120 days passes from the time of initial
3 power operation and the plant has not been declared
4 commercial, you are obligated to inform the FPC as
5 to why that has not occurred.

6 The specific things, then, that happen that
7 are important to the company relative to declaring
8 it commercial are that you change the accounting basis;
9 you no longer capitalize the interest charges, and you
10 no longer capitalize the operating and maintenance
11 costs associated with startup. You begin to charge
12 those operating and maintenance costs to the income
13 statement. You begin to take depreciation charges
14 against income. You cease the capitalizing of the
15 returns on investment, sometimes referred to as the
16 AFC -- in other words, you begin again to incur
17 expenses directly reflected in the income statement
18 for the interest on any associated bonds, preferred
19 stock, or common stock dividends, and they now are
20 reflected directly against the operating income
21 statement of the company, and so now, absent rate
22 relief or rate recognition that grants operating
23 revenues to offset those items of expenses that are
24 now recognized currently, the income of the company
25 begins to suffer a significant impact. And that

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2 is really the most concrete and definitive thing that
3 happens when you declare a plant commercial.

4 So in these times, probably more so than in
5 periods 20 years ago or 15 years ago, with the extreme
6 investments of, you know, several hundred million
7 dollars that are outstanding at the time that a plant
8 is ready to be made commercial, it becomes terribly
9 important that rate-making activities with the State
10 regulators have a chance to go forward so as to
11 attempt, as best you can, to synchronize the granting
12 of revenues to offset those expenses and the time
13 at which you declare the plant commercial and begin
14 to incur those expenses. If you do not, there is a
15 time period of expense for those items of O&M
16 depreciation and fixed charges that are forever lost
17 and directly impact the income of the company.

18 (Continued on Page 107.)

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Q Were there certain tax advantages that

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would accrue to the company if Unit 2 was declared

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commercial prior to the end of 1978?

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A Let me just back up one minute and say that I

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am sure that in the material that you have collected

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through the, you know, the process of subpoena and

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the like has provided a letter in 1978 to the

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Pennsylvania PUC and the Jersey PUC in which we

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attempted to, as simply as possible, portray the exact

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effects and criteria and results of declaring the

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plant commercial. So there is a good reference from

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our point of view.

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One of the motivations for us having done that

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with the absence of definitive criteria on books of

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the FPC that could be used, so we were attempting to

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provide a set of ground rules that everyone could work

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to.

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Now, on the matter of taxes, let's just

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identify that there are two tax related items that

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are of significance; one, the investment tax credit,

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and that tax credit is taken in a way with respect to

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deferral of taxes such that the effect of that tax

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credit shows up in the income statement over a period

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of years and gets recognized in the rate-making so

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2 that any benefits of the investment tax credit flow
3 to the rate payer and not to the investor, so that
4 that tax credit gets recognized in calculating or
5 reflecting the tax obligations of the company which,
6 in turn, the derivation of the revenues required or
7 thus the rates that the customers must pay. So since
8 that credit is reflected in these tax obligations in
9 the future over a normalizing time period of some
10 number of years -- I think generally over the life of
11 the plant -- in effect, the tax credits flow to the
12 customer and do not flow to the investors.

13 The second area of tax effects relate to what
14 is sometimes, I guess, called the half year conven-
15 tion on depreciation that says if a plant goes in
16 service anytime during the year, and let's say
17 specifically the last half of the year, for tax
18 purposes, you are able to take a full half year of
19 depreciation but you need to show on the books for
20 income purposes only a pro rata share of appreciation
21 in accordance with the actual number of days, weeks
22 or months that the plant is in service. So there can
23 be, in effect then, acceleration of the availability
24 of that tax deduction associated with accelerated
25 depreciation which can be of benefit to the company

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2 in terms of cash flow which, in turn, gets recognized
3 many times in rate-making as being called customer
4 supplied capital. It is not capital that we had to
5 put up by selling bonds or stock but rather capital
6 that is made available by the customers having paid
7 revenues but we did not have to pay the tax obligations
8 until later. So there is some cash leftover in the
9 meantime, so there is that effect, but that gets
10 recognized in rate-making.

11 Then there is the further effect then that to
12 the extent that that depreciation impact in a year in
13 one of our jurisdictions, in New Jersey, is normalized
14 -- that is spread over the future, again so that it
15 gets recognized in rate-making whereas in Pennsylvania
16 they do not recognize normalization and thus it can be
17 taken currently and can have a minor impact on the
18 stated income of the company for that time period,
19 keeping in mind though that to the extent that you
20 have taken that tax effect and that credit down, it
21 isn't available to you later at some other time in
22 the life of the property. So it is really a timing
23 difference on that depreciation benefit of property
24 ownership.

25 So, yes, there is a degree of benefit to the

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2 company from the six-month convention on accelerated
3 depreciation if we could get to the point where the
4 plant could be recognized as depreciable property in
5 this time period before the end of the year.

6 Detailed looks at the tax law indicate so that one
7 did not have to declare the plant commercial in order
8 to be able to do that. There are tax cases in the
9 case histories and records, or whatever you legal
10 folks call them, that say that when the plant gets to
11 a certain degree of readiness to operate or some
12 fuzzy measure of operability, that then one can
13 qualify for this six-month conventional depreciation
14 and the impact that has on the income statement and
15 the like.

16 Q Were you advised of that in the fall or late
17 fall of 1978?

18 A We were aware of that tax effect and that
19 accounting treatment. Frankly, we worried mostly
20 about whether or not the regulatory environment,
21 whether we should treat the Pennsylvania piece the
22 same way as the Jersey piece, namely of normalizing it
23 so it would be spread over the life of the property
24 and subsequently taken to account in rate-making or
25 whether to do it immediately as an effect on 1978

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2 income. That was the principal feature of our concern,
3 again recognizing that the rate-making process is one
4 that has so many degrees of freedom in terms of the
5 manner in which costs and expenses and revenues are
6 adjusted and normalized and rates of return are
7 established in that the regulator always has the
8 ability to adjust the numbers to get the end results,
9 and so one can simply fool himself by trying to take
10 advantage of a timing differential on the recognition
11 of a certain tax deduction. But we ultimately did go
12 ahead and take advantage of that six-month convention
13 in the Pennsylvania portion of our revenues and
14 expenses and earnings, keeping in mind then that this
15 was not a unique situation; this absence of the
16 normalization procedure is pretty well established in
17 the Pennsylvania regulation. It had been done before
18 by us and others with other plants. I could hardly
19 identify it as having been a major consideration
20 relative to the specific activities of the plant
21 startup program.

22 Q In 1978 did GPU take that half year
23 convention or what they called a modified half year
24 convention?

25 A Joan, you are beyond my detailed knowledge of

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2 the tax law with respect to that difference, whatever
3 it is.

4 MS. GOLDFRANK: I would like to request
5 that we be provided with the GPU consolidated
6 tax return for 1978.

7 Q You indicated that with respect to invest-
8 ment tax credits, that that would be passed onto the
9 consumer in establishing the rates.

10 A Yes.

11 Q Would all of that be passed onto the
12 consumer or is a certain percentage of it --

13 A I think all of it because it all shows up in
14 calculating the tax obligations of the company and
15 thus the revenue requirements to provide a given level
16 of earnings in the regulatory process.

17 Q It is all calculated in to determine the
18 rate base; is that how --

19 A Not the rate base, the earnings required to give
20 a rate of return so, you know, after we get down to
21 the operating revenue, operating income and after we
22 take off the income taxes, which income tax is then an
23 add in the income taxes, which income taxes may be
24 reduced by virtue of some investment tax credits.
25 That, in turn, leads then to an operating income of

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2 income taxes which the regulator then relates to a
3 rate of return on the capital that is employed in the
4 business, giving recognition to the actual interests
5 costs, the actual preferred dividend costs, and then
6 setting an allowed rate of return on the common equity
7 and then using those three parameters against the
8 capitalization ratios, and many times also adding a
9 fourth increment of capital, namely customer-supplied
10 capital at a zero rate of return. Then it equates
11 this income to that rate of return on rate base and
12 the income is calculated, recognizing any income tax
13 obligations that are there.

14 Again, that can be different on a cash flow
15 basis. While one has a statement of income tax obli-
16 gation, those taxes may not be paid in cash in that
17 time period but ultimately they have to be paid if
18 normalized and spread over some time period in the
19 future.

20 Q You indicated that you were aware that this
21 half year convention could apply independent of when
22 Unit 2 was declared commercial.

23 A Yes.

24 Q Were you aware of that in 1973?

25 A Yes.

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2 Q And who advised you as to that?

3 A I think it came as a combination from our
4 comptroller and the Tax Department that reports to him
5 and the general counsel of the corporation.

6 (Discussion was held off the record.)

7 MS. GOLDFRANK: If the manner in which
8 Unit 2 was depreciated by GPU in 1978 is not
9 attached to its consolidated tax return, we
10 would request that we be provided with a
11 schedule of that depreciation.

12 Q In the fall of 1978 a Commercial Operation
13 Review Board was established?

14 A Yes.

15 Q To determine the technical and operational
16 readiness of Unit 2 to be declared commercial?

17 A Yes.

18 Q Were you involved in establishing that
19 board, that mechanism?

20 A Yes, I was involved in establishing the mechanism
21 and I think it effectively was applied before Unit 2 of
22 TMI. It seemed to me that because of the interface,
23 organizational interface relationship between the
24 service company conducting the design and the
25 construction and the operating companies being the

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2 owners of the plant and the subsequent operators of
3 the plant, there was a need for a degree of formali-
4 zation of this transition in responsibility, and as
5 I say, it seemed to me to be an appropriate thing to
6 formalize that transition and to provide some assur-
7 ance that the state of the job was known at the time
8 of the transition and that any remaining problems
9 were identified on a punch list for completion, that
10 responsibility for that completion was assigned and
11 that there was evidence that the operating companies
12 were aware of what they were getting, you know, and
13 had gone through a systematic review of the pieces and
14 parts and systems and equipment and everything asso-
15 ciated with the plant. It just seemed to me like a
16 good way to do business.

17 Q This is what we have previously marked as
18 Finfrock Exhibit 2, an October 26, 1978 pamphlet
19 concerning the Commercial Operation Review Board
20 manual. Were you involved in establishing the criteria
21 that begins on Page 2 of this Exhibit which was used to
22 assess the readiness of Unit 2?

23 A Joan, I think I would say that I was involved in
24 terms of discussions at the time. I think this was
25 before -- this is Three Mile 2 -- but what led to this

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2 manual started out to be put into place earlier than
3 the Three Mile 2 application.

4 I notice this is dated 6/27/78. The concept of
5 the service company manual was sort of in process for
6 a couple of years. I think the basic concept of the
7 formalized aspect of the turnover, maybe some elements
8 of it, were applied to TMI 1, but then I think the
9 next level of refinement on that approach showed up
10 on the Homer City 3 plant and I am sure that I was
11 involved both with Bill Verrochi and his staff and
12 then Bob Arnold and his staff and indicating the areas
13 that I thought were important for such a review to
14 include, but I was not involved in the specifics of
15 enumerating them or the specific language or that sort
16 of thing. I left that to the staff to arrive, them-
17 selves, at what those things should be.

18 Q Do you know if outside of Met Ed or GPU
19 anybody or any organization was contacted or consulted
20 concerning the criteria for determining readiness of
21 Unit 2?

22 A Not that I know of, no. I am sure that -- I
23 suspect -- I guess I shouldn't say "sure" -- I have
24 to suspect or assume that in the course of the review
25 B&W and Burns & Roe in some ways participated in that

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2 review, but I don't think, to my knowledge, they were
3 involved or even should have been involved in the
4 establishment of these criteria for the turnover. As
5 far as I was concerned, that was an internal manage-
6 ment discipline kind of matter, internal to GPU.

7 Now, whether there was someone along the line
8 of a consultant of some sort that we might have talked
9 to about this, I don't know. You know, it is conceiv-
10 able that there could be, but I don't know, you know,
11 of any conscious study where we went to somebody and
12 said, "Hey, if you want to do this, what do you think
13 you ought to do," and therefore wrote a set of recom-
14 mendations to us.

15 Q So as far as you know there wasn't any
16 contact or consultation with the NRC?

17 A Not to my knowledge at all. This is not a
18 requirement of the NRC in anyway, to my knowledge.
19 I think, you know, the NRC regulations don't particu-
20 larly contemplate the kind of organizational structure
21 or arrangement that we have. I don't know of any NRC
22 involvement in this. Of course, being able to fulfill
23 the NRC requirements on procedures, quality assurance
24 plans, and things like that, certainly are an element
25 of readiness, but the concept of a formalizing of the

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turnover and a review of the state of readiness as we go through it, I have no knowledge at all of any relationship between that and the NRC.

You know, in a sense, maybe some of this comes out of my background with some of the space program activities where we tended to have these kinds of formalized turnover reviews as you passed a piece of equipment from one set of organizational responsibilities to another.

Q As of March 1, 1979, Gary Miller was made a manager reporting directly to the vice-president of generation.

A Right.

Q As opposed to reporting to the manager for generation operations.

A Nuclear operations or something, who was Sandy Lawyer, yes.

Q Did you have any involvement in the decision to raise Gary Miller to the position of station manager reporting directly to the vice-president?

A You know, while it did not happen as a result of my strict direct directions, I certainly feel that I influenced the organization and the direction of the organization because I felt that there was no

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2 justification for an added layer between the plant
3 and Jack Herbein. I didn't see a meaningful real
4 function for that added layer. I felt that whatever
5 function there was there, which was largely one of
6 coordinating the Reading level support to the plant,
7 could be accomplished without having Gary Miller
8 report through Jack Herbein. I felt that this was a
9 way to increase Herbein's immediate awareness of what
10 was going on at the plant and I felt it was also a
11 way to elevate the management status of the people at
12 the plant.

13 So I certainly agitated for that kind of a move,
14 but I did not mandate it, and when it occurred, then
15 I was pleased that we made that change.

16 Q Was this the result of any particular
17 concern on your part or --

18 A No, I think, you know, the concerns and things
19 that I just enumerated were the ones in my mind and
20 they were a generalized concern, they were not a
21 result of a specific observation or any specific
22 concerns or any specific assessments of people or
23 things of that sort.

24 As a matter of fact, I had, for some time, sort
25 of been on a campaign of working within the management

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2 structures to try to achieve a higher level of recog-
3 nition for the people in the nuclear plants to make
4 sure that they were better compensated and to, as I
5 say -- well, I guess just be concerned about layers of
6 management that could somehow reduce the need for
7 direct awareness and visibility on the part of Jack
8 Herbein.

9 You know, there was no question but that Three
10 Mile Island was his largest, most important, most
11 critical responsibility, and I felt that the closer
12 he could be kept to that, the better things would be.

13 Q Was there a desire at that time to separate
14 out the alignment with respect to the nuclear respon-
15 sibilities as opposed to the fossil fuel generating
16 plants?

17 A I don't know of any significant specific or
18 consideration about that and my memory for the details
19 may not be right, but I was not -- as I sit here, I
20 am not of the impression that Sandy Lawyer had any
21 particular responsibilities relative to the fossil
22 plants, that those reported separately to Jack Herbein
23 through another fellow, that Sandy Lawyer was only
24 nuclear operations. I may be wrong on that but I
25 don't -- there may have been, you know, a companion

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2 move organizationally, but as far as I was concerned,
3 that was kind of an ancillary thing and not any part
4 of any key strategy or motivation or plan.

5 Q How did you learn of the accident at Three
6 Mile Island on March 28?

7 A I was in Harrisburg, Pennsylvania, I guess, over-
8 night on the 27th. That morning Bill Verrochi and I
9 had breakfast with two senior members of the
10 Pennsylvania State Legislature's Energy and Mines
11 Committee. We were on our way to a meeting with the
12 Pennsylvania PUC and its staff concerning what was
13 called a management annual review meeting which was an
14 opportunity for direct status report conversation
15 between the company management and the PUC in a non-
16 adversary, non-rate case, not limited by ex parte
17 considerations kind of environment, which was to start
18 at 9:00 o'clock.

19 We arrived at the hearing room of the North
20 Office Building of the Pennsylvania State capitol
21 about a quarter to 9:00 and someone there gave me a
22 message that said "There is an emergency at Three Mile
23 Island. Call Creitz at this number." So I called
24 after great trouble and fumbling with the telephone
25 and whether you did or didn't need a "1." I finally

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2 got hold of Walter Creitz.

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Q In Reading?

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A Yes, and I guess, you know, it was probably a
5 few minutes to 9:00.

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Q What did he inform you?

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A Well, he said that there had been -- well, that
8 there was a site emergency. He said that there had
9 been, you know, a SCRAM in the plant, there had been
10 actuation of the emergency safety features, emergency
11 core cooling system, emergency safety features, that
12 there was concern or evidence about fuel damage, that
13 radiation measurements had been made off-site and that
14 any levels of radiation release were very, very
15 minimal, you know, MR, some very small kind of a level
16 and did not indicate, you know, that there was any
17 state of continuing uncertainty or chaos or the like

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In fact, I guess I would have to say that I
19 sort of got the impression that it was a reactor
20 shutdown transient of some sort and actuation of the
21 safety features, but that it was basically over and
22 done with and it was a case now of sorting out what
23 had happened. I think that was my immediate reaction
24 at the time. I was immediately reluctant to believe
25 that there had been a problem in terms of fuel damage,

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and in discussing that I subsequently called Bob Arnold immediately after I talked to Creitz -- and I don't know which one of them; I am sure Walter mentioned the indication of fuel damage and I think Bob Arnold did also.

My immediate reaction was, "Well, gee, I am a little reluctant to have us reach that conclusion because the emergency core cooling systems are supposed to be designed to prevent that from happening and if we had fuel damage, that means the emergency core cooling systems did not do their job." I said there might be some other mechanisms or some minor degree of radiation release that could be responsible. I didn't realize at the time the levels of radiation that were observable within the containment building and I didn't realize at that time that there had been defeat or interference with the simple direct operation of the emergency core cooling systems.

Q Did you issue any instructions to Mr. Creitz?

A No, I don't think I did.

Q And after you hung up the phone with him, you called Bob Arnold?

A Yes.

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Q And where was he when you called him?

A I think -- I am pretty sure he was in Parsippany.

Q Did you instruct Mr. Arnold as to any action?

A No, I made no instructions in terms of specifics relative to the plant. I am sure there might have been something about, well, you know, "I will get back to you," you know, "Find out more about what is happening. I will call back later." That kind of thing, but I suspect that I -- you know, I have certain recollections of having asked questions about emergency core cooling systems and water, but Arnold was not close enough to the details of what was going on that he was really aware or knowledgeable and confident about what was happening.

But certainly, no, there was no attempt on my part to sort of assume command of what was happening. I was rather in a mode of recognizing that there was an uncertain situation. I was not of the impression that it was continuing to progress or degrade, and I guess I drew the implication or conclusion that things were essentially under control but there was some uncertainty as to exactly what had happened and what

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2 the ramifications were.

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Q Did you call the plant?

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A No, I did not.

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Q Did you ask Mr. Arnold to go to Three Mile
6 Island?

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A I did not. not at that time.

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Q You proceeded to go to your meeting?

9

A I went right into the PUC meeting. I made a
10 brief statement to the group there concerning the
11 information that I had from Three Mile and told them
12 that I would update that later in the course of the
13 meeting.

14

I got back in touch with, I think Arnold, or
15 either Bob Arnold and Creitz, probably in the 10:30 to
16 11:00 time period and then did make a further comment
17 to the PUC group sometime a few minutes before noon
18 or something like that.

19

Q What was that comment?

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A I think it was to the extent that there had been
21 this -- I guess as I sit here I don't really remember
22 exactly the words, but you know, there is a transcript
23 available of what was said -- to the effect that there
24 had been a problem at Three Mile Island, that we
25 were not yet sure of exactly what was happening but

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2 that the off-site radiation measurements did not
3 indicate any significant damage or danger to the
4 health and safety of the public.

5 Q The second conversation you had with
6 Mr. Arnold and Mr. Creitz, did you ask either of them
7 at that time to go to Three Mile Island?

8 A No, I did not.

9 Q Was Mr. Arnold still in Parsippany?

10 A Yes, he was.

11 Q At what time did you arrive or did you go
12 to Three Mile Island?

13 A I did not go to Three Mile Island on that day.

14 Q You went the next day?

15 A I was at the observation center on Thursday,
16 the next day.

17 Q On March 28 you did not go to the observa-
18 tion center?

19 A That is right, I did not.

20 Q At any time did you ask Mr. Arnold to go
21 to the site?

22 A Not on March 28.

23 Q What responsibilities did you undertake
24 once you arrived at the observation center the next
25 day?

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A The next day I went out because we were being visited by two groups. One was Senator Hart and the other one was Congressman McCormick, and so when I was there I did, on that occasion, speak with Jack Herbein, Gary Miller, gained an impression of the status of things at the plant both from talking to Jack and from the briefing that he gave to the congressman.

I spoke briefly to the congressman, sort of introductory remarks, cautioning them to the effect that there were a lot of unknowns that we had yet to work out, figure out, and that therefore the kind of information we could give them, the descriptions we could give them were necessarily tentative. And then we went back to Parsippany late that afternoon.

Q Have you had any role in the recovery efforts with respect to the accident?

A Well, let me back up and just fill in a couple of things. On Wednesday I did meet Herbein and Miller and George Kunder on the steps of the State capitol as they were going to visit the lieutenant governor to brief him, and at that point got kind of a brief, very brief, five-minute rundown from them about the status of things. I expressed my concern to them

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2 as to how come there are so many of you here and not
3 back at the plant.

4 Probably on Wednesday evening at home, in talking
5 whether it was Wednesday evening or perhaps even
6 Thursday morning before leaving for Three Mile Island,
7 talking with Bob Arnold we discussed the business of
8 putting together an investigation team of people from
9 Met Ed and the service company to begin to dig into
10 what happened and to, you know, understand what
11 happened.

12 On Thursday night when I returned home from the
13 observation center, Arnold, in talking with him, was
14 able to tell me more about the details of what had
15 happened and the like, and he put together some
16 further thoughts about what we ought to be doing to
17 begin to support and organize to take care of certain
18 aspects of the accident. He said, "Shall I come in
19 and see you in the morning to review it?" This would
20 have been Friday morning -- and I said, "No, Bob, I
21 think the better thing for you to do would to be go
22 straight out to the Island and get together immediately
23 with Herbeing and begin immediately to put these
24 things into place."

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2 On Friday morning, I was in the office, and
3 generally, again, of the view that, you know, there
4 had been this problem, this accident, there was this
5 unknown degree of damage to the core -- there had
6 indeed been core damage; there indeed was fission
7 products released into the reactor building and the
8 auxiliary building, but that things appeared to be
9 in a stable condition of cooling down and the like,
10 and I guess it was then at about 9:00, say between
11 9:00 and 10:00, when I became aware of the Friday
12 morning radiation release problem, which immediately
13 signaled that the problem was more serious and more
14 extensive than I had previously understood to be the
15 case, and I began to think then in terms of calling
16 together outside experts to give us a hand in assessing
17 the situation, in figuring out what we had to do and
18 proceed with solving whatever problems we were
19 faced with, and so I began to contact as many people
20 as I knew around the country and around the industry,
21 indicating to them just in very general terms the
22 kind of background or skills or knowledge that I
23 thought we ought to have.

24 Bud Cherry of the Service Company staff, vice-
25 president of Planning, who has a nuclear background,

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2 gave me a hand by calling a few people that he knew
3 or that he and I agreed he would call.

4 I spent the entire day and night at the
5 Parsippany office, was in phone contact with the
6 site fairly routinely -- you know, maybe once every
7 hour, once every hour and a half or so -- from, let's
8 say, Friday noon on and throughout Friday night and
9 early Saturday morning. It was at that time that
10 I became increasingly, you know, aware of things
11 like the degree of hydrogen release, the pressure
12 spike in the containment that was interpreted as
13 hydrogen, the presence of the hydrogen bubble in the
14 primary loop, the calculated amounts of hydrogen and
15 thus the inferred amount of zirconium involved, and
16 thus the inferred amount or fraction of core damage;
17 the amounts of radiation in the water in the contain-
18 ment building, the problems of continued hydrogen
19 generation through the radiolysis of the water, the
20 schemes and the techniques that were being used to
21 measure the volume of the hydrogen bubble in the
22 primary cooling circuit.

23 I sort of talked primarily with Bob Arnold
24 and Bill Lowe, a consultant, as part of this acci-
25 dent assessment team, and in the meantime, proceeded,

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2 as I say, during most of the day on Friday and then
3 continuing starting Saturday morning, to try to
4 mobilize as many people as I could to come to the
5 site to give us a hand without really knowing
6 exactly what we had to do, but just that we were going
7 to be faced with a lot of unprecedented problems that
8 we could surely use more breadth of skill and
9 knowledge and experience in handling.

10 Q Would you suggest that there exist a
11 standing organization, similar to the kind you brought
12 together in terms of experience and knowledge, for
13 such purposes?

14 A I think so, Joan. I think that, you know, the
15 problem that we faced was severalfold: first, of
16 not having previously identified the telltale indi-
17 cators that would be -- that would give you the
18 earliest, most reliable indicator of exactly the
19 depth of the problem that you faced. That is separate
20 from your question, but I think that was one of the
21 problems that led to where we were, which, in effect,
22 then was the slow recognition of exactly what was the
23 problem.

24 Then, I think beyond that, I think that when
25 you look at the kind of challenge and the kind of

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response that was required and would again be required in a similar event, it is not likely that a normal station-operating complement or operating organization would have either that number of people or that spectrum of skills on-site at all times.

Then again, with the situation being unprecedented, I had no prior concept of what were the most important and the limiting tasks or obligations, and thus what organizational elements would naturally fall or, you know, naturally derive from meeting those requirements, and also had no sense of the relative priority of the kind of tasks that we faced.

So I do think that one could help himself significantly in the future by taking advantage of the Three Mile Island accident as kind of a model experience in saying, not only what kind of an organization should we have, but also what are those, what is that list of telltale indicators that aren't for the purpose of telling me about normal operation of the plant, but are for the purpose of telling me about extreme abnormal operations or abnormal conditions.

Then, with respect to the organization, I think you can say that in almost any accident of

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2 substance, the basic elements that we ended up putting
3 in place will be required, and the basic spectrum of
4 skills will be required, and so I think it would be
5 helpful to have sort of a pre-established structure,
6 a pre-established listing of alternate people in whom
7 you had enough confidence in terms of their leader-
8 ship abilities and their background of experience to
9 take charge, and a listing of people and alternate
10 people from various sources that would fill out the
11 spectrum of skills and capabilities that you would
12 need. And I think it would be helpful to have that
13 throughout, whether it is on a plant-by-plant basis
14 or regional basis, or in some way so that it is
15 implementable not on an ad hoc basis, but on a prior
16 knowledge basis, that you not only have the structure
17 and the people identified in their own mind, but those
18 people also recognize that one day they may be called
19 to come to the scene and participate in that kind of
20 thinking, and I think, by the way, that the industry
21 response activities, the Floyd-Lewis Committee and
22 groups in that total operation, are indeed looking
23 at this kind of a thing as one of the lessons to be
24 learned from the Three Mile Island accident.

25 Q We were discussing, or you were discussing

1
2 one lesson that you felt was learned from the March 28
3 incident at Three Mile Island creating a central
4 resource center or regional resource center with
5 respect to expertise that could be called in in
6 similar situations.

7 A Yes.

8 Q What other lessons have you thought about
9 or impressions that you have gained from the experience
10 at Three Mile Island?

11 A Well, that is a whole range of things, of course,
12 Joan. Let me just finish the previous scenario and
13 then turn to that in this sense.

14 It was probably sometime late morning on
15 Saturday that I got three quick calls in succession
16 from John Henry, from Harold Denton and from Watson,
17 Jack Watson at the White House, concerning urging us
18 to get mobilized to do something about the problem,
19 at which point, of course, we pretty well had lined up
20 a lot of people to show up at the site.

21 I then physically departed for the site, I
22 guess, around two o'clock in the afternoon.

23 I got there, I think, maybe around 4:00, at
24 which time, sort of early arrivals of this support
25 Industry Advisory Group were just beginning to show

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2 up and sort of had the initial discussions with them,
3 sort of outlined what I thought were the immediate
4 tasks or challenges ahead of us, and tried to
5 identify some guys from within that group to assume
6 leadership of pieces of that, and sort of asked the
7 others to fit themselves into that structure on the
8 basis of their own awareness of where they could best
9 contribute and be flexible, and then go from there
10 into what is normally called the Industry Advisory
11 Group, and a number of people came into that over a
12 period of time, and it all led downstream then to,
13 I guess it was about Wednesday, when we sort of
14 formally put forth an organizational structure to
15 sort of establish the direct line of activities both
16 at the plant and the relationship to the Industry
17 Advisory Group and other things, and so things
18 settled down a heck of a lot at that point.

19 Again, I think that the thing that could be
20 done the next time around -- and let's hope to God
21 there never is a next time -- but is that you could
22 avoid what to me was maybe slow, but a necessary
23 time period to sort out the problems and priorities.
24 I guess I wasn't giant enough to be able to know
25 instaneously exactly what to do and who to do it

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2 with, but I think you could take advantage of the
3 experience now to have a leg up the next time in
4 knowing how to go at it.

5 Back on the other thing of other things to
6 learn, as I say, I think, you know, it was just a
7 whole raft of those things, just a whole tremendous
8 array of them, but I mentioned, I think, one of them
9 was one of not having everything geared toward normal,
10 steady state operations, but of a prearranged aware-
11 ness of what critical parameters you would look for
12 to give you what levels of indication of a problem.

13 I said that you could more quickly size up the
14 extent and scope of any accident or situation. I think
15 that was one thing.

16 Do you want to talk about nuclear power, or do
17 you want to talk about the specifics of the accident
18 response with respect to these learnings?

19 Q Let's first talk about the latter, specific
20 response.

21 A Well, I guess, you know, it is obvious also
22 that one of the key challenges that was not met with
23 perfection was that of communicating to the public,
24 or communicating to the public through the news media.
25 I don't think there is any evidence, and there is no

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2 question in my mind that there was no attempt to
3 manage the news. I don't even think there was a
4 conscious attempt to minimize the problem. I suspect
5 that there was a conscious attempt not to overblow
6 the item, but I think that as our own knowledge and
7 understanding of the situation matured and grew over
8 the couple or two or three days, people tended to
9 conclude that we were telling the truth only after we
10 were forced to tell the truth, rather than being
11 willing to recognize that, "Well, maybe indeed there
12 is a growing knowledge and awareness of what happened
13 and thus a growing depth of the story."

14 I think the whole ability of how to communicate
15 that kind of a situation to the press, to the civil
16 decision-making authorities, and to the public is
17 an extremely complex one. I think it requires having
18 people somehow available or in place who are suf-
19 ficiently knowledgeable about the technology that
20 they can communicate in terms that these non-nuclear
21 experts of the civil authorities and the public can
22 understand.

23 I think there is a need to somehow almost
24 "anoint" that communicator with some form of special
25 credibility credentials, so that the focusing can

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2 be on what he is saying, rather than on whether he
3 is or is not truthful, and I think also, in times of
4 this kind of, you know, uncertainty and potential
5 public panic, I think there is a need for a single-
6 mindedness of source. I think there has been criti-
7 cism of, well, why did we defer to the NRC on
8 communicating after a few days? I don't think we
9 would have served the public by providing continued
10 opportunities for focus on the differentials in
11 expression between ourselves and the NRC, even though
12 those differentials might have had no meaning; their
13 mere presence somehow becomes the focus of all of
14 the reporting and all the press commentary and
15 coverage, and I think in a time like this, the public
16 sorely needs a source of information that they can
17 feel is sufficiently independent, having no unique
18 axe to grind, sufficiently knowledgeable, sufficiently
19 credible that they can place confidence in that source
20 of information because they are going to be making
21 judgments about what they perceive as their own
22 health and safety and life and limb.

23 So I am not sure the accident has told us
24 exactly how to solve that problem. I think it may
25 rather have simply given us more insight into the

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2 scope of that challenge, but I do think that the
3 business of credibility is a critical one.

4 I am not sure that even under the best of con-
5 ditions, the operating company could ever be perceived
6 as being absolutely one without self-interest and
7 less credible. I would like to hope that the public
8 will and can give a level of confidence in the NRC,
9 the regulator, because if we can't have that confi-
10 dence, I think we have got basic problems with
11 nuclear power.

12 I do think that Harold Denton did an outstanding
13 job in communicating to the public. I don't think
14 he said anything different than a number of us might
15 have been able to say, but still he is the one who
16 did it. He did have that ability to appear constant
17 and cool, competent, unflappable, and take all the
18 comments and all the questions and retain his cool,
19 and I think that lent to the credibility, and I think
20 that was a very important thing to achieve, even though
21 it identified difficulties and faux pas and problems
22 that anybody can find after the fact, but at the time,
23 I think there was a great need for some kind of a symbol
24 of fact, dependable fact, and I think he provided
25 that, and I think that was extremely important. And

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2 as far as I am concerned, I think with respect to the
3 general public, we did the right thing in deferring
4 from independent comment.

5 I think that we, the company, have gotten a
6 black eye as a result of it, in that we became iden-
7 tified as having no credibility; the NRC had to take
8 over. I think we got identified as having been in-
9 competent because, after all, the NRC managed every-
10 thing and made all the decisions.

11 I think that is unfortunate because I think,
12 again, in any situation, as you go forward the
13 company has to be, and the operators of the plant
14 inherently have to be, a continuing part of the
15 picture, and I think ultimately the public -- and by
16 "ultimately," I don't mean very far in the future --
17 the public has to gain confidence in the company that
18 what they are doing is not wrong, undependable or
19 incompetent, because if we build the NRC's credi-
20 bility at the expense of destroying the credibility
21 of the company, I think we end up with an imbalance
22 situation and not a desirable ability to go forward
23 and proceed.

24 To agree, I think we are in the backwash of some
25 of that kind of a problem now to restore a balance of

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2 credibility, so that we can proceed with the kind of
3 things that have to be done.

4 Now, again, I think I am not sure I know
5 exactly how to do that. I think the dynamics of
6 the situation may inherently lead to that kind of a
7 transient response in terms of public perceptions, but
8 I think one ought to be careful about sustaining that
9 for some time.

10 One of the other things that I would comment
11 about is that when a challenge of this sort occurs,
12 I think it is very difficult to assume that you
13 wouldn't have problems of response and problems of
14 people and numbers and competence, and what was
15 described as "thinness." I think you just never have
16 an organization and the capability sitting there,
17 somehow revved up to speed and to all of a sudden
18 turn to Problem X at Location Y. So there is always
19 going to be a kind of a problem, but I think another
20 piece of that is that the NRC will always have -- and
21 I am sure -- an improved ability to respond and bring
22 resources to bear on the problem.

23 However, I think that one of the things that
24 should be recognized is that the adversary relationship,
25 the regulator-regulatee situation that is sort of an

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2 equilibrium, steady state, in place prior to the
3 accident, needs to take a sharp modification at the
4 time of the accident. I don't mean to talk in terms
5 of all of a sudden it is an open ballgame and anybody
6 can do what they feel and all kinds of precautions
7 and health standards and procedures go out the window.
8 I am sure neither we nor any other licensee would
9 conceive of that being the right way to respond, but
10 the point I want to make is that I think when you are
11 responding to the accident, there is less of a need
12 for the I&E cops to stand on the corner and watch.
13 There is rather a need, I think, to coalesce all of
14 the management and technical resources into one
15 consolidated team that is devoted toward doing the
16 job, and in the early days, particularly prior to the
17 first Wednesday following the accident, when we put
18 on the organization, we did have, I think -- while they
19 were not serious -- we had continuing problems of
20 this seeking of this relationship between regulator
21 and regulatee, and none of these, I don't think, were
22 critical, but, you know, it would have just been
23 easier had they not been there. There were occasional
24 discussions of whether using Contractor X would
25 somehow compromise his independence relative to being

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2 an NRC consultant, or that kind of thing. Well, those
3 problems got worked out, but in reality, I think
4 those problems perhaps should not have even been
5 there.

6 Again, I don't want to put these out of context.
7 What I would rather say is what we also counted is
8 that those first few frantic days from late Friday
9 afternoon until about mid-Wednesday or so, it was
10 almost as though there were two teams on-site, and
11 in some ways, these two teams were almost competing
12 for the same external resources.

13 We were calling other nuclear steam suppliers,
14 Combustion or Westinghouse, and the NRC was calling
15 on the nuclear steam suppliers, Combustion and
16 Westinghouse, both of us asking the same or similar
17 questions of the same or similar people, but at dif-
18 ferent times and in different constructions, creating
19 additional confusion.

20 The NRC has available to them the resources of
21 their National Laboratories. Well, those were
22 generally made available for physical things like
23 running analyses and flying in robots or things of
24 that sort. On the other hand, they tended to be
25 held in reserve as the NRC's "think tank" for technical

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2 support and expertise, rather than brought to bear
3 in a consolidated way on the problem.

4 Again, I can't argue that one way there is
5 absolutely right or wrong. There may well be some
6 value from a diversity of technical judgments and
7 approaches.

8 On the other hand, I think the problem of the
9 exploding hydrogen bubble would not have occurred
10 had there been a consolidated inquiry into that issue
11 which brought to bear more of the plant-knowledgeable
12 people and made sure that the scientific backup was
13 given the right kind of boundary conditions and
14 assumptions to work from.

15 So I think it would be helpful if between the
16 licensees and the NRC there could be some degree of
17 understanding of how the working relationships would
18 be established when you had this kind of an accident
19 and the need for the response, and maybe all this
20 could fall out in the form of the organizational
21 structure and the identification of roles and responsi-
22 bilities, and, you know, it was quite dramatic that
23 when we took the step of putting in place an official
24 organizational structure and the like, that all of a
25 sudden, the air cleared significantly. Some of these

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barriers tended all of a sudden to go away. There seemed to be a structure for people to participate in, and the NRC was, I think, reasonably happy with their role in this joint working group kind of a thing. All of a sudden, the major participants reviewed the critical decisions. That didn't mean that the NRC took a different approach to their independent assessment and their independent reviews of procedures and things of that sort, but at least I think things took on a regularity and maybe it was a feeling on their part that all of a sudden a degree of chaos had gone away, and they could be less concerned; you know, that they could depend more on the organization -- and that might have been what it was, too -- but I think that is something that deserves some thought and some attention as to how does one effectively utilize the combined resources of the licensee, any elements of the nuclear industry that are brought in to support, and the NRC or the Government resources.

I think one of the things that was a great problem and a great frustration to all, whether it was in the company or in the NRC or people in the Industry Advisory Group, was the access to a knowledge of what was the status of the plant, what were the physical

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conditions, what were the parameters, what was going on. You know, the control room tended to be the eye of the needle that everything had to pass through. So in order to have effective support organizations outside the plant, those organizations have to have a way to access the plant status and plant information without somehow interfering with what has to be ongoing and continuing in place inside the plant. I think that was something that will be addressed in the future as we put into place plans for an emergency response.

(Continued on Page 148.)

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2 There certainly was another, you know, couple of
3 other areas that I think we experienced and I don't
4 know exact solutions to them.

5 When you get into this kind of a situation you
6 don't have the luxury of a diverse group of people,
7 regulator-regulatee, staring at each other and
8 criticizing designs and secondguessing approaches and
9 asking for alternatives and options. There is really
10 a need to quickly coalesce on an option. You don't
11 have the choice of the optimum, you most times have
12 the choice of a lesser of evils, and more critically,
13 you have a very specific timeclock that is ticking
14 against you. We found ourselves many times working
15 to try to put into place backup capabilities or backup
16 situations that would be needed in the event some
17 unpredictable other event were to occur, like a pump
18 were to fail and we weren't able to restart any pumps,
19 so you didn't have an unlimited time scale available
20 to you. So there was a need to be able to quickly
21 coalesce on an approach and agree with that and begin
22 to do that and not worry about whether it was the
23 optimum or best or the like. It was really a choice
24 of the lesser of evils, if you will, recognizing
25 very critical time lines of response.

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2 We were fortunate in that I don't think we ran
3 into any situation where some of these unpredictable
4 events occurred before we had the -- we had the good
5 luck of not running out of time on any one of these
6 particular items, but that was pretty much the threat
7 that hung over our heads as we had to consider some
8 of the things to do.

9 This then brings into play then the other
10 consideration that says when you have to respond in
11 that kind of an emergency situation, to what extent
12 do you depart from your prior concepts of quality
13 assurance or inspection or inspectability or redun-
14 dancy or procedure or health physics of radiation
15 monitoring or whatever those normal, proper, good
16 business disciplines are. There comes a time when
17 the choice is am I going to do something that is
18 hopefully adequate and on time or am I going to do
19 something that is just peachy dandy and perfect but
20 is too late, and that is a very subjective tradeoff,
21 and I think part of the problem of that is that we
22 find ourselves dealing with a structure, an inter-
23 structure of people on organizations who have become
24 so ingrained or who have had the procedural constraints
25 and quality requirements, et cetera, so ingrained in

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2 them that they have almost lost their ability to
3 think in other terms and to respond in other terms.
4 You have got almost a generation of people at the
5 engineering and construction and design level who
6 have had all of this nuclear discipline drummed into
7 them and they are not able to step away from it when
8 the time is required to do that, or at least it is
9 difficult to get them to set aside those normal
10 elements of discipline which I, in no way, am
11 criticizing but simply saying that there comes a time
12 when you have to maybe recognize a new set of ground
13 rules. So I think that is something also that one
14 needs to anticipate and recognize.

15 We encountered problems -- and again, I don't
16 know what you can do about it particularly -- but all
17 of a sudden you are totally dependent upon the plant
18 staff to be doing things; after all, they are the guys
19 who know where the wires are, who know where the
20 instruments are, who know where the valve operators
21 are, who know what the procedures are, and all of a
22 sudden this plant staff who has been used to operating
23 the plant by themselves has now got hundreds of
24 experts looking over their shoulders and telling them
25 what to do, changing their minds, "Do this in a hurry,

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2 do that in a hurry," so the plant staff all of a sudden
3 becomes terribly frustrated and you have got a very
4 delicate situation again of maintaining the human
5 element of stability and commitment to ride the problem
6 through and it can become a difficult situation if
7 things get out of balance and all of a sudden you
8 lose the support of the plant staff that you
9 inherently have to depend upon. And I think we had a
10 lot of -- we saw considerable amounts of that kind of
11 frustration not because anybody was necessarily doing
12 the wrong thing but just that all of a sudden it was
13 a different ball game that these fellows had not been
14 used to and were not particularly happy about, and
15 people are working long hours, getting tired, trying
16 conditions, and everything is different, everything
17 is new, everything is crash, so it becomes a stress
18 on the situation.

19 I don't have a great solution to that. It is
20 just one of those things that I think you kind of
21 observe and learn about.

22 I don't know whether I have rambled through
23 things, Joan, in any level of priority or sense of
24 priority, and it is probably something that when I
25 get home I will think about that I haven't rambled

2 through, but that is kind of a spectrum or smattering
3 of things that occurred to me as learnings from the
4 accident and certainly there are a lot of things that
5 you learn at the detailed engineering or detailed
6 plant implementation, detailed instrumentation kind
7 of level that says, "Gee, I ought to have the ability
8 to take radioactive samples in place better so that
9 it can be done more nearly remotely so that you have
10 less chance of incurring critical overexposures in the
11 process; you need to have in place more ability to
12 respond to health physics challenges of these kinds
13 of levels of contamination as contrasted with normal
14 plant operating levels; you have got to have more
15 awareness of when the health physics or radiological
16 monitoring assumptions that are valid under normal
17 conditions are no longer valid and you have got to
18 begin to change your techniques and use different
19 detectors and different analyses and recognize
20 different uncertainties." Again, just a whole host
21 of kind of things that I think clearly were observed
22 both by the plant staff and the NRC and by many of
23 those other people who came in to help us.

24 I think one of the values of a lot of people
25 coming in to help us was the opportunity to see for

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2 themselves exactly what a situation like that was like,
3 what it means and what a challenge it presents.

4 Q With respect to broader issues that were
5 maybe learned as a result of this accident, not
6 specific responses in that emergency situation but
7 lessons that would have been learned as a result that
8 could be applied in a normal operating plant?

9 A Well, when I think about the lessons learned
10 or my version of NUREG 0578, I would have devoted the
11 first hundred pages to recognition of need to improve
12 the manner in which we derive knowledge from
13 operating experience, to assess that operating experi-
14 ence, to interpret it in terms of its safety ramifi-
15 cations and to feed that information onto both the
16 plant designers and operators at the earliest possible
17 time and get it implemented, and to me that is prob-
18 ably one of the most significant learnings of the
19 whole accident is the degree to which the inade-
20 quacies of that experience feedback loop, in my mind,
21 significantly contributed to making us and the plant
22 vulnerable to this accident. So I think that is
23 probably one of the most important and most funda-
24 mental features of the whole thing.

25 Beyond that, the next thing that I would point

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2 to is the need to be less -- to take off the blinders
3 that tend to be imposed by a concentration on the
4 so-called design basis accidents and to more broadly
5 recognize the spectrum of things that can happen.
6 You know, let me just give you an example.

7 In our case, I think probably in many other
8 plants, but in this case, one of the items of design
9 that can be criticized is the fact that the contain-
10 ment was set to isolate on a four-pound pressure
11 which, on any analysis of the design basis LOCA,
12 large type break accident is clearly a good strong,
13 unambiguous signal, but in this accident it wasn't
14 worth a nickel. So what happened then, because of a
15 concentration, a preoccupation with a narrow presump-
16 tion that the accident would be characterized, the
17 design basis accident parameters were chosen for
18 critical functions like isolating the containment
19 which didn't even relate to the specific item you are
20 wanting to protect against, namely the release of
21 radiation. So the most direct observation, the most
22 direct measurement of radiation level within the
23 containment is being the signal for, or one of the
24 signals for containment isolation wasn't even in
25 existence, wasn't required, is not in existence in

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2 many plants, leave along Three Mile.

3 So I think that is just an example, I think, of
4 the kind of thing that says, "If you allow yourself
5 to become too preoccupied or too convinced about the
6 validity or the narrowness of the definition of your
7 design basis accidents, you can be led into what
8 appeared to be perfectly valid approaches but which
9 approaches may not be useful under a spectrum of
10 different or lesser or alternative kind of accidents."
11 So I think, to me again, in a basic kind of way I
12 think that is one of the things to do is to step back
13 and take greater cognizance of that range of possible
14 accidents and to ask yourself "What is it I am really
15 trying to achieve and what is the most fundamental
16 indicator of that situation that I am trying to
17 protect against or from or whatever?" So I think that
18 is a key one.

19 I think one of the other ones that we talked
20 about was this one of the need to somehow bring to
21 bear more technological, phenomenological understanding
22 adjacent to or immediately available to the control
23 room at all times through some assignment of people
24 with broader, deeper training, degreed engineers, what
25 have you -- I think they would have to be more than

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2 just degreed engineers, I think they would have to be
3 degreed engineers who had spent some time and had some
4 exposure and experience in the business of the
5 specific analysis of plant transients and responses
6 and core behavior and things of that nature, you know,
7 the critical elements that relate to safety.

8 I think one of the other things then is what,
9 in my mind, is not going to end up having been a
10 major contributor to the accident but it certainly
11 was a high visibility failing on our part, namely the
12 blocked emergency feed valves. By whatever mechanism,
13 they got closed. I have to conclude that it really
14 was an administrative, human error-type of failure
15 and that we need to conceive of ways that recognize
16 the dangers of humdrum attention to detail but
17 achieve attention to detail coupled with some kind of
18 levels of personal commitment and some kinds of over-
19 checking or whatever techniques they may be that get
20 that personal commitment thing in there that mini-
21 mizes probability of that kind of human error, admin-
22 istrative error, whatever it was, that sort of
23 inadequate use of a checklist, the cursory assumption
24 that Charlie did something when, in fact, I am not
25 absolutely sure that Charlie did something.

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2 So I think that that is a real challenge as to
3 how to sharpen the organization's consciousness of
4 those kinds of things and to maintain that sharpness.
5 The other area that I think deserves attention
6 is the manner in which we overload the operating
7 management staff with a myriad of administrative
8 details that the regulations impose upon us. Again,
9 I don't want to -- and I am not able to single out any
10 one particular paperwork aspect of regulation that I
11 say absolutely should be abolished -- but what I do
12 say is that the paperwork can become such an over-
13 powering, demanding obsession that it becomes the
14 first priority thing for the plant management and
15 staff and inherently has the effect, I think, or must
16 have the effect of diverting their attention from
17 these more human aspects of making sure that people
18 are trained, people are motivated, people are selected,
19 people are kept sharp and that we know what is going
20 on, we are looking at the procedure and we are looking
21 at the quality of the entries in the log books, and
22 we are looking at the degree of commitment in filling
23 out the check sheets and all that kind of thing as
24 contrasted with filing all the reports, filing all the
25 responses, keeping track. Somehow I think we have to

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2 find organizational approaches to somehow -- I hate
3 to use the word -- but double team the problem; on
4 the one hand you have a piece of organization that is
5 responsible for a lot of these paperwork aspects and
6 another piece of the organization that is responsible
7 for the quality of the operation. Recognizing that
8 those two can't be separated completely because the
9 paperwork isn't just paperwork for its own self, it
10 does, indeed, also relate to the quality of the
11 operation, but is there a way that we can decouple
12 them so that the dog work of administrative detail
13 doesn't become the dominant part of the job, and I
14 think that is a critical kind of a thing.

15 Let's talk of some of the more technical items
16 of instruments and environmental concerns, and I can
17 subscribe to 0578 and there is no great need for me
18 to repeat those things. I do think, though, there are
19 some fundamental things I am disappointed 0578 doesn't
20 touch on. I am a little surprised that 0578 makes
21 reference to concerns about management people in the
22 control room interrupting the sense of responsibility
23 in the chain of command. I am surprised that somehow
24 the NRC isn't identified as one of those potential
25 extraneous individuals in the control room that might

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2 confuse or blur that awareness of the chain of command.
3 I think there is another comment in there somewhere
4 about the number of people in the control room. Well,
5 again, that is a problem but again, there are a number
6 of parties that contribute to that number. Yet I
7 don't want to ding them; I would just say each blindman
8 looks at the element from his different point of view.
9 If there is anything we like about the Presidential
10 Commission it is that you weren't one of the blindmen that
11 was previously involved and perhaps don't have a
12 point of view, you can perhaps be broad in your
13 thinking.

14 Q You personally, obviously, have thought
15 in depth about the implications of this accident at
16 Three Mile Island. How, as an institution, has GPU
17 determined it will resolve some of the things you
18 have thought about?

19 A We haven't resolved those by any way, shape, or
20 form, Joan. I think we have been very, very much
21 involved in devoting our dominant resources to serving
22 the needs of Three Mile in terms of the immediate
23 response to the accident and the cleanup and recovery
24 of Unit 2, and hopefully one day the restart of Unit 1.
25 I think that the kind of things that we have identified

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2 in our letter of June 28 to Harold Denton about the
3 things that we would modify precedent to restart of
4 Unit 1, and then, in a longer term, they are indica-
5 tive of our assessment of the technical learning.

6 Some of our immediate responses relative to TMI
7 have been to pool together, for the time being, the
8 resources of the Met Ed organization and the service
9 company design and construction organization. In so
10 doing we have expanded the number of professional
11 people available from, I think, around 70 to around 230.
12 So we have felt that our priorities had to be on
13 taking care of things at Three Mile and we are just
14 going to dedicate that staff of people to do that.

15 We folded them together under Bob Arnold in
16 whom we have a lot of confidence. He is a competent,
17 knowledgeable, and cool, steady manager and a
18 knowledgeable guy.

19 We have tried to rearrange that more detailed
20 structure at the Island with respect to attention to
21 this business of trying to segregate the management
22 attention to operating excellence from the management
23 attention to the administrative paperwork details and
24 all the support functions. I don't know whether you
25 have encountered it in your prior discussions, but

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1
2 we have gotten rid of the one-to-one relationship
3 between Herbein and Miller and we have sort of put
4 them to a degree side by side even though Miller
5 still reports to Jack, but he doesn't report in series
6 with the operating staff of the plant, and Gary's job
7 is to devote his attention to all of these adminis-
8 trative and support functions, and in a sense, so have
9 -- this, even, is the kind of thing that he was
10 complaining about in this last, you know Ivan
11 Finfrock one or whatever it is that the TMI manage-
12 ment review group was looking at. In a sense I think
13 Gary was complaining about the amount of his time
14 that he had to devote to extract administrative
15 support. So we are hoping to achieve some improvement
16 there by trying to separate these functions of direct
17 responsibility for the excellence of operations from
18 the responsibility for the administrative support and
19 other kinds of activities.

20 We have begun to look at the operation at
21 Oyster Creek. I have asked Dr. Bartonoff, the
22 president of Jersey Central, and Ivan Finfrock speci-
23 fically to take a look at the kind of lessons learned
24 from Three Mile Island and to begin to put in place
25 some of these things at Oyster Creek, and again, that

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2 runs a gamut of things from reviewing the quality or
3 the approach of the procedures, themselves down through
4 reviewing the kind of things that we would use to
5 identify the presence of an emergency, to improving
6 our ability to monitor radiation releases in the
7 event of an emergency, beginning to think about how
8 we would organize and have some kind of an emergency
9 response capability and, again, a spectrum of things,
10 and that activity is going on. In fact, I am meeting
11 tomorrow with Jersey Central-Oyster Creek staff to
12 sort of get a progress report on what they are doing
13 in that area.

14 As time goes on and as we achieve a degree of
15 regulatity or equilibrium with respect to the Three
16 Mile situation, I think even though we haven't done it,
17 but I think we will continue to progress towards a
18 combined nuclear operations function which combines
19 these activities, these organizations, puts the
20 people under a common leadership and a common manage-
21 ment. Again, as we discussed earlier, the same people
22 might be there the same basic boxes on the chart might
23 be there, but at least we would have a dedicated
24 organization who had no other diversions, no other
25 things to worry about, no rate cases to worry about,

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2 no customer complaints to worry about, simply to have
3 a singleminded dedication towards safe operation of
4 the nuclear plant, and I think that we will get there.
5 I think there is going to be some timing and some
6 phasing questions of how we do that, and I think
7 there is also going to be some questions of what we
8 have to do in the sense of complying with the NRC
9 regulations in terms of who is the owner, who is the
10 licensee, who is the operator, and you know, one is
11 not completely free to simply modify these organiza-
12 tions willy-nilly. So all those factors have to be
13 considered in arriving at how they get there, but it
14 is not unreasonable and I think it is probable that
15 in a manner of a year or so we would end up with a
16 fifth subsidiary of GPU which would be called the
17 Nuclear Operations Company or something like that.

18 Q One of the concerns that you have raised
19 and that the Commission has looked into is how or how
20 much attention was paid to operating experience,
21 whether it was within a utility itself or within the
22 industry, within the NRC. Have you thought about a
23 viable solution to that problem?

24 A Well, the extent -- by the way, I think that
25 rightly or wrongly we made the assumption that the

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1
2 suppliers, because of the commonality of seeing supply
3 equipment and their interests, would act as one
4 channel of aggregation of that experience and feedback.
5 We also made the assumption that because of the
6 mechanism of the licensee event reports and the
7 organization structure of the NRC in their bulletins,
8 et cetera, that that would be another channel, and
9 that therefore there was not a need for us to attempt
10 to reproduce that and certainly not in its totality
11 so that we could be self-sufficient or independent of
12 those channels. I think if you really had asked us
13 about that prior to the accident we would probably
14 have said that those channels are maybe 95 or 99
15 percent of the feedback and those things that we
16 ourselves deduce from talking to other colleagues in
17 the utility business or attending Power Generation
18 Committee meetings or reading LERS or reading other
19 kinds of commercial reports and services that are
20 available, LER summaries and the like, would be maybe
21 five percent -- maybe I don't have the mix right,
22 maybe it is 90-10 or whatever it is, but I think
23 certainly we presumed and we had a right to presume
24 that those other channels were functioning.

25 Now, going beyond that and having said that,

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2 I think one of the critical things we need to do is
3 to make those channels indeed functional and opera-
4 tional. I am not sure that I know exactly the way to
5 do it, but I would suspect that a good way or a good
6 start would be to have each utility first have its
7 own group who were dedicated to analyzing the
8 operating experience of its own plant or plants, to
9 not just, you know, sluff off little observations of
10 relay failures or pump failures or valve failures as
11 being isolated incidents of equipment malfunction,
12 but rather to kind of take another look at them in
13 terms of what is their potential meaning, how signi-
14 ficant was it, should we suffer that kind of exposure
15 to that kind of a failure, what if we hadn't caught
16 this in time, that kind of continued assessment of
17 the everyday experiences that the plant is generating,
18 and then that staff and similar staffs from like
19 plants -- and by "like plants," I probably mean plants
20 with the same nuclear steam supply vendor -- forming
21 something that we would call the owner's group or the
22 like that would, in turn, then perhaps meet as
23 frequently as monthly to share these results and
24 perhaps tighten the loop for the steam supplier to be
25 aware of our own findings, to do their own analysis

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Dieckamp

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2 from their point of view of greater specific knowledge
3 about the nuclear steam supply and its workings than
4 what the individual utility may have, and of perhaps
5 on a monthly basis, one or two-day sessions, where
6 people from each of the operating plants of that
7 variety come together and review these experiences
8 and try to tighten that loop both by, you know, a
9 conscious dedication of people to the conscious
10 timeliness of events that caused those things to be
11 reviewed and discussed and increase just the human
12 and interaction and getting to know people.

13 (Continued on following page.)

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SM:mf

Dieckamp

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2 I don't care what business you are in,
3 if you know Charlie, you are a lot more willing to
4 call up Charlie and ask him, "Hey, did you ever
5 have this problem?"

6 So, again, I think if these people
7 were working together, we probably would find a
8 greatly improved, maybe by a factor of ten, in the
9 timeliness of feedback and awareness of these kinds
10 of things and a sharing of experiences and anticipa-
11 tion of "This guy has a problem. Maybe we better
12 check on why we haven't had it or when we are going
13 to have it or be prepared for when we have it,"
14 that kind of thing.

15 I think what that really is, then, is
16 a recognition that the elements of hardware design
17 and procedure, all of which contribute to the
18 reliability of safety, are a maturing kind of a
19 thing and they are not something that is state
20 of art stable, and you know, just treat it like
21 an ordinary device, an ordinary power plant, that
22 you make a commitment to that derived experience-
23 based learning and feedback and improvement and
24 upgrading relative to all of the hardware design
25 logic and procedural things that contribute to:

the reliability of safety.

Now, in saying that, I haven't identified where the NRC fits in that loop and I guess I haven't thought long enough or, you know, hard enough in terms of whether it would make sense for the NRC to be doing the same kind of a thing, perhaps in a redundant loop, but perhaps coming together into this same monthly sharing kind of a situation.

You know, we really are, both the licensee and the regulator are dedicated to this same end objective.

There is no reason why we should let some kind of a relationship, adversary relationship, impede our ability to derive learning and put it into place, and you know, I think that many of these things would have enough judgment to them that probably there would be a value of having an independent multiple path for assessment and evaluation of things and then an attempt to perhaps resolve them jointly between the operators and the regulators, and again to say, we have got a common objective and that is to achieve the highest level of safety reliability that we can.

I think we can do that. I think that

2 is a workable scheme, and I think the only thing
3 that might be different now is an increased
4 awareness on the part of more people that we do
5 need to treat this subject as one where operating
6 experience can play a significant role in maturing
7 that whole reliability picture.

8 See, I refer to it as the reliability
9 of safety and the elements that contribute to that.

10 Q This morning, off the record, before
11 we started, you mentioned a concern with the
12 Commission, the President's Commission, looking
13 at Metropolitan Edison as a utility or GPU with
14 a magnifying glass.

15 A Microscope.

16 Q A microscope.

17 A Electron microscope.

18 Q Could you expand on that a little
19 bit, please?

20 A Well, I didn't mean to be critical, Joan.
21 I was only curious that -- and I think my curiosity
22 doesn't relate only to the Commission, it relates
23 also to the NRC and it relates also to the Committees
24 of Congress that, you know, ultimately the company,
25 the company's future, the company's credibility out

1
2 in Pennsylvania, the company's ability to function
3 and engender the trust of the whole public as it
4 relates to how we ultimately are portrayed in
5 terms of our competence, our sincerity and our truth-
6 fulness and the like, and I think that since we
7 are talking about items of subjective qualities for
8 which we have no objective scale of measures, it
9 is very difficult when one looks at an organization
10 alone and identifies, you know, surely in a
11 constructive way, what are perceived as its pluses
12 and minuses, but still we don't have a way to
13 really know in an absolute sense what balances of
14 pluses and minuses constitute normal performance,
15 excellent performance and sub-par performance,
16 and I guess I think usually when confronted with
17 that kind of a problem, I think one has little
18 choice but to approach it, in a sense, in a
19 comparative way. You say, "Well, what is the
20 industry norm? What is the industry standard?
21 How do the other people do it?"

22 If a number of people have approached
23 the problem independently, if one then looks
24 at the various areas of commonality in their approach,
25 you can probably deduce something about what are

2 the basic ingredients, and it was only in that
3 regard that I was raising the question that I think
4 that now we are what we are, we will be measured
5 for what we are or what we were, the pluses
6 and minuses, the bruises and lumps and warts
7 will all be there to see, but those judgments
8 may lack true meaning unless they are placed in
9 some context.

10 Now, in that sense, let me just say,
11 for example, we were a year ago, a year and a
12 half ago, when the Commission came out with its
13 attempt at a comparative analysis of licensed
14 performance in terms of non-compliances per hour
15 of inspection or whatever those parameters were.
16 I had no trouble recognizing that they were making
17 a crude attempt to derive meaning from questionable
18 statistics, but on the other hand, we had nothing
19 else to look at and it had to have some measure
20 of significance in terms of relative performance
21 and comparable performance, and in a comparable
22 endeavor with comparable levels of inspections
23 and oversight, and I think that again my purpose
24 is not to derive comfort from the feeling that,
25 "Well, gee, we are no worse than anybody else,"

but rather to say when we try to assess the
3 degree to which staff, management, procedure
4 awareness and competence were or were not contri-
5 butors to the accident, I think it is important
6 to somehow know whether that was because those
7 parameters were obviously sub-par, normal or
8 whatever that range is.

I hope I have indicated what my
10 thought is on the subject.

Q Since March 28, you have made various
12 statements before different organizations concerning
13 the accident at Three Mile Island.

You testified before the Hart Committee.

A Yes.

Q On April 23, 1979?

A Yes.

QA And submitted your written testimony,
19 correct?

A Yes.

Q You also testified before the Udall
22 Committee?

A Right.

Q On May 24, 1979?

A Right.

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Q And prepared written testimony for that appearance?

A Right.

Q You --

A Similar content, minor variations in some technical detail or wording.

Q You also testified on May 30, 1979 before the President's Commission and prepared a written statement for your testimony before that Commission?

A Yes, and that attached things like the Udall testimony and a condensed sequence of events description.

Don't forget Mike McCormack's Science and Technology Energy Production Subcommittee of the House Science and Technology Committee, and it seemed to me that was around May 30th.

That was some time late in May. That testimony was a little bit different, Joan, in the sense that it picks up the front portions of the Hart-Udall testimony in terms of what happened and the like, but then goes on to comment broadly about the meanings or learnings or the technological implications, or a kind of areas of

2 future technological improvement or contribution
3 or things of that sort.

4 Q Did you prepare a written statement
5 for them?

6 A Yes, if you don't have that, we can send
7 that to you.

8 MS. GOLDFRANK: I would like to
9 request that we be provided with a copy of
10 Mr. Dieckamp's written testimony before the McCormack
11 Committee. It looks to me like it was on May 23rd.

12 Q Other than the President's Commission,
13 the Hart Committee, the Udall Committee, and the
14 McCormack Committee, have you made any other
15 statements?

16 A Well, there have been statements in RFA
17 Case Hearings in both Pennsylvania and New Jersey.
18 In general, those are derived directly from the
19 Udall statement which is sort of the second round,
20 upgraded Hart testimony.

21 So, you know, it is the same basic
22 material.

23 There tends then to be some separate
24 comment in response to questions from either the
25 Commission or the staff of the Commission or the

interveners in those rate cases.

Do you have those rate case testimonies
or proceedings?

MS. GOLDFRANK: No, we don't.

THE WITNESS: Again, if you would
like, they are available. I don't know that
you would find -- you know, there may or
may not be an item there that becomes of
interest to you.

A key concern that the rate commissioners
have had has been the implications of the
accident with respect to the operability
and timing of the operability of Unit 1 at
Three Mile Island.

MS. GOLDFRANK: I would like to
request that we be provided with copies

THE WITNESS: I will get you both
Pennsylvania and New Jersey, and Alan, let
me just say ahead of time, I think there were
two dates in Pennsylvania and one in New
Jersey, but we can check that.

Q Were you ever interviewed by the NRC?

A No. You mean the NRC Investigation team?

Q Yes.

1
2 A No.

3 Q Have you been notified by any organization
4 that you would be interviewed or deposed subsequent
5 today?

6 A I am not, as I sit here today, I have no
7 awareness of any future things. I gather -- I
8 don't sense any activity or continuing activity
9 with respect to the McCormack Committee. I think
10 the Udall Committee is largely completed relative
11 to Three Mile. I gather the Hart Committee is
12 sort of remobilizing itself. I don't know what
13 may be in the offing there. I have no indication
14 at this point as to what they are contemplating or
15 planning.

16 I have not heard from the Regovan
17 activity of the NRC. We do have also the Governor's
18 Commission in Pennsylvania and the Select Committee
19 of the two Houses of the Pennsylvania Legislature.
20 Again, both of which have largely concentrated on
21 the response of the State and Local Government
22 and have not taken testimony from the company,
23 and we have no dates as of this time or any in-
24 dication of the dates to testify.

25 Q Have you written any memoranda addressing

1
2 specific issues arising out of the March 28th
3 accident?

4 A Well, there are two memoranda to the Board
5 of Directors concerning the potential cost of
6 recovery of Unit 2. Nothing else comes to mind
7 as a memorandum to anyone or to the file.

8 MS. GOLDFRANKE I would like to
9 request that we be provided with copies of
10 Mr. Dieckamp's memoranda to the board concern-
11 ing the cost of recovery.

12 Q At this time I have no further questions.
13 I would like to recess this deposition. I don't
14 anticipate that we would call you back for further
15 questioning, but it is possible that at some future
16 date we would want to ask you further questions.

17 A All right.

18 (The deposition was adjourned at
19 4:00 p.m.)

20 -----
21 HERMAN MAIER DIECKAMP
22 Subscribed and sworn to before me
23 this _____ day of _____ 1979.

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25

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

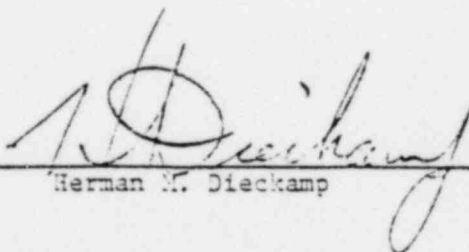
Corrections to August 15, 1979. Deposition of Herman M. Dieckamp

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
6	3 7	D20 electronic	D ₂ O electron
7	8 25	thermo- hydrate	thermal hydride
8	2 3 11 23	ally hydrate Startup (delete) as	alloy hydride and Project Management to
11	21	Rodish	Roddis
21	16	self-efficiency	self-sufficiency
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54	25	progress	program
81	4	guide	aide
97	12	another	enough
103	5	those	thousand
105	11	being	begin
108	20	appreciation	depreciation
112	22 23 25	which income tax is then an add in the income taxes of	delete delete after


PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

Corrections to August 15, 1979, Deposition of Herman M. Dieckamp

<u>Page</u>	<u>Line</u>	<u>Change</u>	<u>To Read</u>
119	8	report through Jack Herbein	report through someone to Jack Herbein
121	21	game	gave
133	13	throughout	thoughtout
134	16	John Henry	Joe Hendrie
139	7	less	thus


Herman M. Dieckamp

Subscribed and sworn to
before me this 28th day
of August, 1979


Notary Public

MILDRED MISURA
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires June 16, 1982

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21 _____
HERMAN MAIER DIECKAMP

22 Subscribed and sworn to before me
23 this 28 day of August 1979.

24 _____
25 MILDRED MISURA

NOTARY PUBLIC OF NEW JERSEY
My Commission Expires June 16, 1982