

1 MARSH: The date is May 9th. The time is 8:57 p.m. This is Bob
2 Marsh. I am an investigator with the U. S. Nuclear Regulatory Commission.
3 Assigned to the Chicago, Illinois, Region III offices. This evening
4 we are located in trailer 203 at the Three Mile Island site. And we
5 are here for the purpose of interviewing Mr. Robert Arnold, Vice
6 President with General Public Utilities, GPU. Before we start I would
7 like each of these individuals in the room to identify themselves,
8 spell their last names and give their title. If you would Bob start.

9
10 MARTIN: My name is Robert Martin. I am Chief Nuclear Support Section,
11 Region II NRC Office.

12
13 GIBSON: My name is Albert F. Gibson, Chief, Radiation Support Section,
14 Region II, Atlanta.

15
16 MARSH: Now Mr. Arnold if you would.

17
18 ARNOLD: Yes. My name is Robert C. Arnold. And I am Vice President,
19 Generation, GPU Service Corporation.

20
21 MARSH: Marsh: Mr. Arnold if you would just well first before I ask
22 you to give some background, before we turned the tape on we had
23 discussed just very briefly this two page memo and included in this
24 memo which covers the purpose of the investigation, covers in some
25 detail the scope and authority of the U. S. Nuclear Regulatory Commission

1 in the accomplishment of this investigation. And to some extent your
2 rights during this investigation. At the conclusion of it, are three
3 questions which I would like to make a matter of the record on the
4 tape. You have read this and I noticed you have signed off on it, but
5 I'd like your responses for the tape. Question one reads "Do you
6 understand the above?" making reference to the two-page memo.

7
8 ARNOLD: Yes sir.

9
10 MARSH: And question two reads "Do we have your permission to tape the
11 interview?"

12
13 ARNOLD: Yes sir.

14
15 MARSH: And the third question reads "Do you want a copy of the tape?"

16
17 ARNOLD: Yes sir, I do.

18
19 MARSH: Okay. In addition to that tape copy of which I'll provide you
20 at the termination of the interview I will also provide a copy of the
21 transcript as it becomes available. There is a fourth question covered
22 in the body which we have been covering with your people as we go
23 along. It may not be appropriate here, but I'll indicate it anyway.
24 Normally on the tapes at this point I do ask the people ah they do
25 have the right to have a company representative or a union representative

1 present. And at this point I would request them to respond to that if
2 they do want representation.

3
4 ARNOLD: I am aware of my right in that regard and I do not desire to
5 have anyone here.

6
7 MARSH: Fine. At that point then to begin with, Mr. Arnold, if you
8 would could you give us a short resume of your background and your
9 year history with GPU?

10
11 ARNOLD: Yes, I am a 1959 graduate from the University of Michigan
12 with a degree in Science Engineering. I initially served ten years in
13 the Navy prior to, or subsequent to graduation from college the first
14 four years of which was in destroyers and the last six years of which
15 were in the Navy Nuclear Power Program, including the one year of
16 nuclear power training. I was qualified as an engineer officer of the
17 watch in the Navy's Nuclear Power Program and I was qualified as a
18 reactor control technician, in fact a chief reactor control technician
19 at the AIW prototype where I was a reactor control material officer
20 for about a year, and I was also qualified for engineer officer on
21 nuclear powered ship. I resigned from the Navy and terminated my
22 active duty with the rank of Lieutenant Commander. I came with the
23 Metropolitan Edison Company in Reading, Pennsylvania, in September of
24 1969, where I was an engineer on the staff of the superintendent of
25 production. At that time TMI Unit No. 1 was about a year and a half

1 into its construction. Unit No. 2 was a few months into construction.
2 My initial assignments were various project engineering responsibilities
3 in the Production Department, including some association with TMI Unit
4 No. 1's staffing and plans for training of the staff. In 1971, June
5 of 1971, I was made supervisor of Production which was essentially
6 assistant department head. The Production Department was responsible
7 for the operation, maintenance and engineering support of all the
8 Metropolitan Edison Company generating, operated generating stations.
9 In January 1972, I assumed the responsibility of the department head.
10 In January of 1973, the department was elevated organizationally to
11 where I reported directly to the President as manager of generation
12 with the same general scope of responsibility but more management
13 freedom. In December 1973, I was made a vice president of Metropolitan
14 Edison Company. And it was in September of 1974 that Three Mile
15 Island Unit 1 went commercial. So that from June of 1971 through the
16 date of commercial operation, the station superintendent for Three
17 Mile Island reported directly to me. I continued in that assignment
18 until June of 1977, at which time I became Vice President of Generation
19 of the GPU Service Corporation. Primary responsibility in that assign-
20 ment was for design and construction of new generating facilities,
21 major modifications to existing stations, and I had what would probably
22 most closely described as corporate staff responsibility for policy,
23 coordination, of the implementation of maintenance and operations in
24 engineering support for the three operating company's generating
25 stations. I have continued in that role in that assignment until the
present.

1 MARSH: Sir, you indicated that you have three generating stations
2 under your control, could you list those? Talking TMI 1, what other
3 ones?

4
5 ARNOLD: I don't believe I said three generating stations.

6
7 MARTIN: I believe he meant the three utilities under GPU.

8
9 MARSH: Three utilities then fine.

10
11 ARNOLD: Yes. The three operating utilities' generating stations.

12
13 MARSH: Okay, that's close enough.

14
15 ARNOLD: I had responsibility, as I say, sort of as corporate staff
16 but not line responsibility for those stations. In addition, I might
17 mention that within the GPU Service Corporation, we had centralized a
18 number of the more specialized technical efforts to provide support
19 for the existing nuclear stations and the new, as well as of course
20 this support for the ones under construction. The most notable of
21 that is nuclear fuel.

22
23 GIBSON: Where are your corporate offices now, sir?
24
25

1 ARNOLD: Ah the corporate offices are 260 Cherry Hill Road, Parsippany.
2 My office is located at 1 Bloomfield Avenue, Mountain Lakes, New
3 Jersey.

4
5 MARTIN: And can you briefly describe for this record the relationship
6 of Metropolitan Edison, let me reverse the direction, GPU with Metro-
7 politian Edison, stressing such matters as either routine technical
8 support type functions or nonroutine assistance other than those that
9 you have already mentioned in your general description? I take it
10 from the general comments you made you provide basically specialized
11 support, engineering support, and it seems to be directed specialized
12 support in matters such as fuel, procurement or fuel management. And
13 that would be designing for the TMI facility would be the major modi-
14 fications that may be undertaken. Is there a size or a, is there a
15 size limit or some other benchmark at which GPU Service would become
16 involved in the engineering aspects?

17
18 ARNOLD: Let me just talk about it a little bit because its not that
19 precise an arrangement in general. First of all, I think its important
20 to understand there are four subsidiaries to General Public Utilities.

21
22 MARTIN: May I have a little water?

23
24 MARSH: Well, I'll wait till Bob gets back.
25

1 GIBSON: Thank you.

2
3 ARNOLD: I think first of all its important to realize there are four
4 subsidiaries of General Public Utilities. Three of them, Pennsylvania
5 Electric Company, Metropolitan Edison Company, and Jersey Central
6 Power and Light, joint owners of the Three Mile Island facility, are
7 operating electric utility companies. The fourth, GPU Service Corporation,
8 was established in May of 1971 as I recall to provide certain centralized
9 capabilities for the GPU system. General Public Utilities, the parent
10 corporation, owned all the common stock of all three operating companies
11 and is the owner of the GPU Service Corporation. GPU Service Corporation
12 by charter or by bylaw is only available to serve on a non-profit
13 basis, the operating subsidiaries. General Public Utilities, per se
14 has a very limited number of employees: basically the officers of the
15 company. and the president of General Public Utilities is also the
16 president for the GPU Service Corporation, Herman DeCamp. The chairman
17 of General Public Utilities is also the chairman of GPU Service Corpora-
18 tion and of each of the three operating subsidiaries and is the chief
19 executive officer of each of those five corporations. The presidents
20 of the individual operating companies are the chief operating officers
21 for their respective company. And Herman DeCamp is the chief operating
22 officer for GPU Service Corporation and for General Public Utilities.
23 So that the line responsibility for the operation of the individual
24 operating subsidiaries rests with the operating subsidiaries corporate
25 officers. GPU Service Corporation provides a coordination and integration

1 of those issues which are, which need to be dealt with on a common
2 basis across the system for economy of operation, efficiency of operation,
3 reliability of the system. That's consistent with and in fact the
4 objective of the holding act. So within the Generation Division,
5 which I head up in the GPU Service Corporation, we do as you indicated
6 provide specialized services to the three operating companies that can
7 best be provided on centralized basis. So that ah nuclear fuel manage-
8 ment, procurement of application services, is done on a centralized
9 basis within within my division, or the in core fuel management issues.
10 Within the Service Corporation another division uranium procurement,
11 is ... is handled on a centralized basis and they also handle planning
12 for subsequent storage, shipment disposal of spent fuel. All operating
13 and maintenance budgets and capital budgets of the individual operating
14 subsidiary generating stations or generation divisions are reviewed by
15 myself and my members of my staff for me. All authorizations to
16 committ funds above a \$100,000 are reviewed an approved by myself as
17 part of the internal processes. In terms of whether or not we would
18 provide the engineering services that is not so much a function of the
19 dollar amount as it is the capabilities that we have and whether or
20 not we can do it more efficiently than either being done within the
21 individual operating company or contracted out. In general work
22 that's contracted out we do not manage for the service corporation,
23 for the individual operating utility other than very large jobs for
24 which a substantial engineering and construction management staff may
25 be necessary. They would contract fuel services directly.

1 MARTIN: For a sense of perspective, could you give me a rough estimate
2 of the size of the GPU Service Corporation in terms of staff professional
3 or technical staff. These really, we only need the rough numbers just
4 for a perspective of the staff size that's available.

5
6 ARNOLD: My recollection is that the GPU Service Corporation has about
7 550 employees, 250 of which are in the generation division. Of that
8 250 the I would estimate 175 to 190 are professional or technical
9 specialist.

10
11 MARTIN: As you may know Al and I are covering obviously the same
12 incident but we are focusing in somewhat different time frames, so if
13 I could I would like to ask you to direct your attention initially to
14 the initial day of the incident and most of the questions I'll be
15 directing toward you will cover that more limited period of time, from
16 the time of the start of the incident the turbine trip to the time at
17 which the reactor coolant pump 1A was put into service. So that is
18 the focus at this point. Could you inform me of the manner and approximate
19 timing to the best of your recollection of when you first became aware
20 that there were difficulties at the TMI site on March 28?

21
22 ARNOLD: Yes. I'll before preceeding the answer to that let me kind
23 of put a qualifier on all my responses at this time and then I won't I
24 will refrain from adding a qualifier each time. I think it would be
25 unrealistic for me to think of my recollection of the initial Wednesday,

1 Thursday and Friday, Saturday sequence of events and when I might of
2 talked to whom and what the nature of those conversations were with a
3 great deal of accuracy. So I will, I guess acknowledge ahead of time
4 there may well be discrepancies that develop as time goes on and
5 additional people are interviewed. I do remember with great precision
6 assuming that without atesting to the accuracy of my clock, but the
7 clock on my desk when I was notified was 7:59 on Wednesday the 28th, I
8 received a call from George Tropher, who is the manager, Operational
9 Quality Assurance for Metropolitan Edison Company. During which time
10 he informed me that there had been a turbine and reactor trip at Three
11 Mile Island Unit No. 2, that B steam generator appeared to have a
12 primary to secondary leak, that there were increased radiation levels
13 in the reactor compartment and that a site emergency had been declared.

14
15 MARSH: Where would Mr. Tropher's normal duty station be? Would he be
16 calling from Reading or from the site? Or where would he have been
17 when he called you?

18
19 ARONOLD: Mr. Tropher was calling me from Reading which is his normal
20 work location. At least as far as I know he was in Reading. I assume
21 he was when he called. Attempts had been made to reach me prior to my
22 arrival at the office just prior to which almost coincided with George's
23 call but I'd left home already.
24
25

1 MARTIN: Could you tell me if the call to you would have been placed
2 as part of a preplanned no indication of GP Service Company, that is
3 GP Service Company has some specific emergency response responsibility
4 or was it more of an information to a to an executive officer in that
5 regard?

6
7 ARNOLD: It's some of each, I think. The emergency plan does not
8 identify the specific responsibility on the part of the Service Corpora-
9 tion as far as I know. However, the notification requirements, if not
10 in the emergency plan then of other administrative procedures relating
11 to notification for off-normal events includes notification to the
12 vice president of Generation and GPU Services Corporation. My interpre-
13 tation of that requirement and I was in position to identify the list
14 of people to be named at one point when we were writing those procedures
15 is that the vice president of Generation would be the most likely
16 person to be in position to respond appropriately with technical
17 systems on an off-normal condition.

18
19 MARTIN: You are in a sense anticipating my the second question I am
20 about to ask. But before I ask that one, in view of the sequencing
21 with you being called, and what you just related as to the administrative
22 procedures which would call for notification of the Vice President of
23 Generation. Do you believe that you were the first GPU Service Company
24 official notified? Do you have any reason to believe that perhaps
25 other staff members had received notification prior to you?

1 ARNOLD: I would expect that I would be probably the first that they
2 would attempt to contact. And to my knowledge no one was contract,
3 contacted prior to myself.
4

5 MARTIN: Will you then describe to me what initial actions you took in
6 ... perhaps in your position and with your responsibilities as Vice
7 President?
8

9 ARNOLD: Well, the ... I guess the first thing I did was to leave word
10 at the office of Dick Wilson who is my Director of Technical Functions
11 and who has reporting to him four departments, Quality Assurance,
12 Systems Engineering, Engineering and Design, and Project Engineering,
13 to come and see me as soon as he arrived that morning. Very shortly
14 after that I talked by telephone with Walt Price who is president of
15 Metropolitan Edison Company, and with ah Jack Herbein, Vice President
16 of Generation of Metropolitan Edison Company, and I don't recall for
17 the moment which the sequence was. I had talked with both of em I
18 think by 8:30.
19

20 MARTIN: Was there a mobilization or an establishment of a line of
21 communication between Mr. Wilson in his role as superintendent of
22 technical functions or members of his staff with the emergency organiza-
23 tion as it would have been constituted at the Three Mile Island site
24 for the purpose of providing essentially on-line technical support?
25

1 ARNOLD: There is not any formal establishment of that kind of arrange-
2 ment. The people within Wilson's four departments are routinely
3 available to site personnel for assistance in various problems or
4 issues. We do not have the, perhaps what might be considered, the
5 equivalent of a emergency response center or emergency control center
6 at our New Jersey offices for this type of incident. My purpose in
7 contacting Mr. Wilson was to inform him that the reactor trip had
8 occurred and that we should get some of his staff lined up to go to
9 the site as expeditiously as could reasonable be achieved. It was not
10 at that point in my mind a, an emergency anywhere near approaching the
11 magnitude or not even of the same nature as what we eventually came to
12 realize we were facing.

13
14 MARTIN: Can you tell me if in fact there was a dispatching of technical
15 people from Mr. Wilson's staff to the site and approximately as best
16 you can remember if it occurred, when it occurred?

17
18 ARNOLD: I don't know what time they left but it's about a three and a
19 half hour trip normally. And I believe they arrived late afternoon or
20 early evening and the initial group to come out here consisted of five
21 professionals. I think three or four of which are supervisor, super-
22 visory engineer level people.

23
24 GIBSON: Mr. Arnold had GPU Service technical people ever been dispatched
25 to the site before in response to a problem such as a trip?

1 ARNOLD: We have never dispatched to the site because of a trip per se.
2 The last previous time I think that we had dispatched them under the
3 certain sense of urgency I guess as opposed to going out to respond to
4 more routine kind of problems ... was ... the reactor trip where we
5 had the steam valve discharge failures which had been I guess upwards
6 of a year ago?

7
8 GIBSON: During your conversations with Dick Wilson and Mr. Herbein,
9 did they specifically request support of you in the early morning
10 hours?

11
12 ARNOLD: Well with regard to Dick Wilson, I informed him that I wanted
13 a group sent. And when I talked to Jack Herbein I either told him
14 that, you know, we were sending or that I would be sending a group. I
15 don't recall if he requested or if I just volunteered. But it was
16 understood between the two of us that I would be sending a group out
17 there to look at, I guess to ensure that I'm not perhaps misleading
18 you, I was not sending them out with the idea that that time that the
19 situation was such that they were needed to place the plant in a safe
20 condition. They were really going out there in order to review the
21 plant history and to initiate the investigations that we normally do
22 after all these plant trips prior to returning the plant to power.

23
24 GIBSON: When you say the investigation that you normally do, is do
25 you mean that in a general term for each of the operating divisions or

1 do you mean specifically that GPU Service Corporation provides a ...
2 performs an investigation of one level or another for each of the unit
3 trips, or other off-normal conditions?
4

5 ARNOLD: GPU Service would ... would, I think can invariably be involved
6 in reviewing any significant off-normal events at any of the stations,
7 but in terms of an investigation prior to returning the plant to
8 power, after a reactor trip it would really depend upon the ... I
9 guess the degree to which we felt we were we understood the reason for
10 the trip and the extent to which anything other than just the obvious
11 causes where we needn't be involved. So we did not usually have
12 transients or off-normal conditions that would have the service corporation
13 participating in a significant way prior to starting up again. But
14 certainly on anything, and in this case I think it was the lack of
15 understanding of the the role of the feed system in initiating the
16 trip as well as the secondary indications of the primary/ secondary
17 leak that lead me to be concerned about the need for a more than
18 routine kind of look at the plant. The information we had at that
19 time was ... I'm talking 8:30, with really only the three telephone
20 calls data recall only being supplied in from Tropher and Herbein was
21 not such that either Dick or I were particular alarmed and certainly
22 were not concerned about the safety of the core at that point.
23

24 MARTIN: Could you describe for me if your contacts with the site
25 throughout the remainder of the first day were frequent? Or was your

1 information, let me rephrase that, were direct? For example perhaps
2 Herbein or did most of your information about the status of the plant
3 in the course of the first day come from other sources other than
4 direct conversations with Herbein?

5
6 ARNOLD: Almost all my information was indirect. I guess referring to
7 the reported comments of Harold Denton, just as you can't manage an
8 emergency from Washington, you can't run the plant from Parsippany so
9 I followed really a practice that I'd established even when I was in
10 Reading and responsible for the operation of Three Mile Island, of
11 attempting to permit the plant level staff, the plant staff, to handle
12 plant issues and be sensitive to any signals from them whether direct
13 or, or subtle. That additional assistance was needed which I could
14 provide or from which the resources I had control of could provide.
15 So I had the conversation with Herbein shortly after 8:00. I believe
16 the next conversation I had with the, as the plant status was, with
17 the plant at about 10:00, as I recall. 10:00 to 10:30 probably. In
18 that case I did call directly into the control room because I knew
19 Herbein not to be available as he was in transient. The ... and I had
20 received a call from B&W asking if I could provide them any assistance
21 in attempting to get in contact with their site manager Lee Rogers,
22 who they thought to be in the control room, but they had been unable
23 to contact him. So I did call the control room at that time, my
24 recollection is that I talked with Lee and Gary Miller. I did get
25 some plant status from them from them. It was not indicative of

1 conditions which increased my concerns significantly of, my recollection
2 is that I did feel that we had the possibility based upon the radiation
3 levels in containment which I didn't have a precise understanding of,
4 but I guess basically, primarily because of the report of the dome
5 monitor reading. Frankly, was so high that it didn't appear to have
6 any correlation with anything that would be meaningful, or would be
7 realistic. And I suspected that we had a moisture problem with a ...
8 or some type of failure from steam in containment, because I was aware
9 that the ruptured disc had failed, on the compartment drain tank. I
10 did have some concern through that we may have some fuel damage at
11 that point. I ... my recollection is I was not as concerned as Herbein
12 was, that or I did not think that probability was quite as high as I
13 felt that Herbein had expressed earlier in the day in talking with me.

14
15 MARSH: Do you recall the approximate time of that call?

16
17 ARNOLD: My recollection is it was about 10:00 or 10:30.

18
19 MARSH: Were you aware at that time that it still at a site emergency
20 level or advised that that had been elevated?

21
22 ARNOLD: I don't recall that I was ever specifically aware that it had
23 been changed from elevated from a site emergency to a general emergency.
24 I just don't, don't know. My next conversation that I recall was, was
25 with Tropher which was about 11:45, nearly as I can recall and which

200 20A

1 was my first understanding that we had indications of off-site releases.
2 I had been in conversation I believe with Walter Kreitz sometimes
3 during the morning as well and for, it was my understanding, I recall
4 why right now, that he was in the process of contacting the Governor's
5 office to discuss the incident and I did not think that he was aware
6 that we had any indications of off-site releases, cause I remember
7 telling George Tropher specifically to be sure he gets the information
8 to Walter Kreitz so that he informs whoever he speaks with whether its
9 the Governor or representative that ... that we do have indications of
10 some off-site releases. That again did not alarm me particularly, in
11 as much as on Unit 1 when we had the reactor drain pump, the reactor
12 drain tank disc rupture, we had, had on occasion had small puffs of
13 xenon which were detectable at the site boundary. Or at least we were
14 aware that they were they were detectable on the plant monitoring
15 system, at least. So I did not yet have the degree of alarm perhaps
16 that was called for. The next time I talked to anyone, and I suspect
17 somewhere about this time I talked with Herbein and I'm sure that some
18 about midmorning I talked with Mr. DeCamp who was in Harrisburg that
19 day. And both or part of Walt and my conversation at the beginning of
20 the morning was with regards to trying to contact him and that we both
21 would do what we could to be sure that he was aware of it. Bill
22 Coons, Chairman of the company, who was home ill, and I did talk with
23 him a couple or three times during the day to alert him about what I
24 knew about the situation. And I talked to Herman DeCamp probably two
25 or three times during the day. The next contact that I had with the

1 site that I recall grew out of additional concern I believe that Dick
2 Wilson triggered because of information that I think came to him
3 through his fuels people who had been in contact with some people at
4 the site talking about plant parameters they were plant parameters and
5 I don't have a specifics on it. I just recall that about 2:00 or
6 thereabouts, I called into the control room again because of some of
7 the information that Dick had gotten through his circuits. And I
8 believe at that time I talked with George Kunder and Lee Rogers again.
9 They were at that time depressurizing to come down on the core flood
10 tanks. We expressed to them a very strong concern that they did not
11 have a solid system. Independent of the pressurizer that they had the
12 steam bubble, the steam bubble in the reactor vessel and the TH legs
13 potentially. I think we really were thinking what a TH legs being
14 void and the only way that that could happen is that they were having
15 obviously very bulk boiling in the reactor vessel.

16
17 MARSH: Excuse me Mr. Arnold, you said "we expressed" was there someone
18 else from your staff as well?

19
20 ARNOLD: Yes, we had, as I recall probably three or four in the room
21 with me on a speaker phone. And I think Dick Wilson and Bob Keaton
22 who is the manager of Systems Engineering were at least there. I
23 don't recall. No, no one else was there. So we expressed as I say at
24 that time out concern that the that they had perhaps uncovered the
25 core, and that they could not be competent at that time that the core

1 was covered from the information that we had. Their response as I
2 recall was that they were competent that they had not uncovered the
3 core and they had depressurized now to the point where they were on
4 the core flood tanks and they had just received indication that the A
5 loop was solid. They did agree that they had probably, undoubtedly
6 had some steam formation in the TH leg. But that as I indicated they
7 felt the A loop was now solid and that the B loop would be solid
8 shortly. And that with the solid loops being restored they would then
9 be in position to have natural circulation. We left that, ended that
10 conversation with us still expressing our concern that they could not
11 be, that we, we were still uneasy about whether or not they had had a
12 solid system. You know I would add that in retrospect obviously they,
13 obvious they had at that time a very large hydrogen bubble and that
14 thought certainly never crossed my mind that they were going through a
15 metal water reaction. Nor do I believe any of the others in the room
16 with me had the thought of that sort of event. My subsequent conversation
17 was I believe next with Jack Herbein, somewhere around 4:00 - 4:30.
18 And in the meantime Wilson and some of his people had continued to
19 discuss among themselves and with me what plant parametric values they
20 thought existed at various times and what the significance of it was.
21 And in particular they were concerned that we may still not have
22 collapsed the steam bubble completely in the system. And I don't
23 recall if Jack called me or I called him. He probably called me cause
24 I am not sure I would know how to get in touch with him at about the
25 time that these conversations had reinforced concerns earlier to where

1 I felt appropriate to perhaps insist a little more strongly on what
2 they would do.

3
4 MARSH: O.K., the time is 9:45. We have just tripped off on the first
5 side of the reel, and we are starting the second reel, second side of
6 the first cassette, meter reading of 728. Excuse me.

7
8 ARNOLD: As I was saying, I recommended strongly to Jack that he
9 insist that they, that the plant personnel, turn on the charging pumps
10 and take the plant solid and ensure that they have collapsed any steam
11 bubbles in the systems. At least taken the plant up to as I recall
12 something like 2200 or 2300 pounds, and that we attempt to get a pump
13 started.

14
15 GIBSON: Mr. Arnold, about what time do you estimate this conversation
16 took place again?

17
18 ARNOLD: My recollection is it was about 4:00 to 4:30.

19
20 GIBSON: Did ... did your staff seem to be the only group at the time
21 who had strong concern about a bubble existing or the core being
22 uncovered?

23
24 ARNOLD: Well, I don't know exactly when, what the timing was when
25 talking to B&W, but my recollection is that very shortly after that

1 conversation with Herbein I talked again with the people in Lynchburg.
2 And I believe they called me and they effectively, as I again as I
3 recall, were making the same recommendation. They did not feel that
4 the plant staff was ... and I shouldn't say plant staff, the people in
5 the control room, were I guess sufficiently in agreement with their
6 perception of things to proceed in that way. I related to them the
7 conversation that I had had with Herbein then. And it could be that
8 the two calls were reversed in sequence, I can't say for sure, but I
9 don't think so. We also talked, as I recall, at that time about
10 getting a pump started and I told them that I would like to be a party
11 to the decision on how to start it. And I think over the next hour
12 and a half or two hours there were a couple of phone calls between
13 Lynchburg and our office perhaps at the site in which we agreed that
14 we would there was agreement I should say that the pump would be
15 initially jogged and not brought up to full speed. And then depending
16 on how that looked, we would either jog again or start the pump. And
17 that was subject to be done at about 8:00, as I recall. There was
18 also conversations I believe or in the conversations that I earlier
19 had with the plant, probably the 2:00 one, at which we talked about
20 starting the pump. And there was a great deal of concern at that time
21 as I recall it as to whether the pump could be run without damage.
22 They described their earlier attempts to run the pumps the lack of of
23 power requirements by the pump indicating that the pump really wasn't
24 pumping any fluid. And the, and I suspect although I can't really
25 recollect ... recall with assurance that they felt that with the solid

1 A loop they would ... would be reestablishing natural circulation.
2 One of the the points that B&W made and what I believe was a conversation
3 after the last conversation, I referred to with Herbein at 4:00 or
4 4:30, was that the 100 amps indicated was during the starting of the
5 pump was less than the motor should draw uncoupled. So there was some
6 inconsistency in the reported power demands of the pump when it was
7 tried earlier in the day. But that's kind of a ragged disjointed
8 account of the conversation but I'm afraid it's about the best I can
9 do.

10
11 GIBSON: The decision to go ahead and pressurize certainly followed
12 that time period or at least the action. As I recall perhaps even
13 immediately after that, I'm trying to remember the exact time frame
14 and it's passed my mind. I think actually the block valve was closed
15 and the 5:00 to 6:00 kind of time frame.

16
17 ARNOLD: No, the block valve, as I understand it, for the electromatic
18 relieve was closed about 6:22.

19
20 GIBSON: It would have been after, what I was trying to get at is that
21 there was a period of time between the time in which you expressed you
22 iterated your strong concern to the staff. I presume to Herbein at
23 that point. And the final decision to ... to go ahead and close the
24 block valve and take the plant on up to full pressure ...
25

1 ARNOLD: Yes. I think that, and it may well have been that the block
2 valve had been opened in the interim in the attempt to depressurize to
3 get on the core flood tanks. In obviously I've looked at some of the
4 sequences of events, information that we put together and hopefully my
5 recollection as to when the conversations took place were not influenced
6 by that, but I believe it was something like the time period from 5:00
7 to 6:30 that they were taking it back to ah full pressure.

8
9 GIBSON: Mr. Arnold, obviously your staff made a very valuable input
10 regarding increasing the reactor coolant system pressure and starting
11 the pump recommending such, had you previously considered the need for
12 having technical staff available to analyze, sit back and analyze
13 plant conditions in an emergency situation and provide advice to the
14 site? And as I can see it's apparent to me that there would be an
15 advantage in having a technical staff that could step back from the
16 crisis and look in a more calm fashion at what's taking place in the
17 control room at in plant parameters and make advice such as your staff
18 did, I was wondering had you preplanned that type of activity? Or if
19 to your knowledge Metropolitan Edison had a technical staff that had
20 that responsibility?

21
22 ARNOLD: I think Al that you have to hear the answer to that question
23 in the context of the industry's general perception of these types of
24 incidents. And at least my characterization of that would be that the
25 type of accidents that we have been concerned about are ones which by

1 and large take place in a very short time frame. And the intent of
2 our procedures and our training of the plant staff has been to give
3 them the ability to recognize the condition of the plant, the condition
4 of the equipment, and operate that equipment in such a way as to
5 terminate off-normal conditions. I don't think any of us really
6 thought of the plant accidents as stretching out over a period of many
7 hours and which would then lend itself to the type of kind off-line
8 resource group to provide that type of advice to the operators. I
9 think the the experience of the March 28 and the succeeding days you
10 know certainly give us cause to rethink that.

11
12 GIBSON: Did GPU Service Corporation dispatch any other people other
13 than that first group of five? That group of five people that were
14 sent from your technical group?

15
16 ARNOLD: Yes. On the, Thursday morning and I don't recall now whether,
17 well I guess I do as I think about it, by Wednesday evening, we had I
18 think had realized that there may well be significant core damage and
19 that was significant in in terms of our view of the world of possi-
20 bilities at that time not significant in terms of what we now have
21 experienced, and that this would not be the type of post trip investi-
22 gation and assessment in return to power that several hours earlier we
23 had been anticipating. So that we had decided Wednesday evening that
24 Dick Wilson would go to the site the following day with some more of
25 his people, to head a relatively formal board of investigation into

1 the incident. We in fact drafted a which I don't recall recall if I
2 drafted that night or the next morning which was prepared in smooth
3 for Herman DeCamp's signature the next, the next day and which Wilson
4 took with him which identified a an investigative board and what the
5 responsibilities of those were. The whole letter being written with
6 the idea that at that point the incident per-se was terminated. I
7 believe there were four more Service Corporation people that went out
8 late Thursday morning and also Tom Kremmens who is Manager of Generation
9 Engineering for Jersey Central Power and Light went to the site and
10 I'm not aware of what prompted him them to go he was, we were very
11 grateful to help them there. I also called Bill Lowe of Pickard and
12 Lowe, early Thursday morning and told him that I thought the situation
13 was quite serious and asked him to serve on the investigative board
14 and asked him to first go to the site as quickly as he could. Which
15 he did do. So then on Thursday we had those five additional people
16 there, mid-afternoon I suppose by the time they got there. In talking
17 with Herman DeCamp on Thursday afternoon and evening, I guess it
18 really more in the evening than afternoon, it was apparent to him that
19 some of the things that my people who had gone out to the site and who
20 had on Wednesday afternoon and evening and during the day on Thursday
21 had begun to piece together was not known at that point and all the
22 details to Jack Herbein. And I did not have a a lot of details but I
23 think by Thursday morning, certainly I was aware that the high pressure,
24 the high pressure injection pumps, had been reduced in their utilization
25 during the early part of the transient to some extent. I didn't

1 really know how much, but that I was aware of and I was also aware
2 that the operators had been principally concerned because of their
3 inability to control pressurizer level and that we had depressurized
4 considerably. As a result of that concern, and I think that at that
5 time as I indicated before I was concerned about the degree to which
6 we may have fuel damage. The ... as a result of you know that that
7 perception of where my understanding was versus the vis a vie Herbein's
8 understanding I made arrangements for a charter flight from Morristown
9 to the site or to Harrisburg for early Friday morning and I arrived
10 out here at about 8:00 a.m. We ... ah we in the meantime through
11 Wilson, really I guess I shouldn't say we, but Wilson had in the
12 meantime I believe probably mostly on Thursday evening, then talking
13 with his people in New Jersey and at Mountain Lakes and had directed a
14 number of them to come to the site. I don't know how many of them got
15 there on Friday, but I suspect there were anywhere from another 10 to
16 30 that showed up some time Friday. And I just don't know by then.
17 Before we were very far in the weekend we had probably in the order of
18 I guess it was 60 to 80 of our Service Company people my division out
19 there.

20
21 GIBSON: I would like at this point to pursue with a specific point
22 and that is the, at about the time period of 2:00 on that afternoon,
23 it was just about the time frame that the plant pressure had been
24 reduced and the core flood tanks had been observed to have a slow
25 discharge and or at least a small level change after they were coupled

682-214

1 to the system, the plant was depressurized, that a decision was made
2 for I believe, if I'm correct Miller, Herbein and I believe Kunder to
3 go to the capitol and at least brief either the Governor or Lieutenant
4 Governor at that point. Were you aware or could you tell me what
5 knowledge you have of that decision if any?

6
7 ARNOLD: I'm sure that I was aware that Herbein was going up to the
8 Governor's Office or Lieutenant Governor's Office whichever he was
9 originally scheduled for. I was not aware until sometime after they
10 had gone up there and I would suspect it was 3:00, 3:30 that Gary and
11 George had gone with him. I was informed of that by Mr. DeCamp who of
12 course was up there also. I knew Jack was going and that was the
13 reason that I called directly into the control room at 2:00 when I
14 described that I had called him.

15
16 MARTIN: Okay. From your own knowledge not conjecture, but from your
17 own knowledge do you know the source of the decision to go to the
18 Governor's Office at that point?

19
20 ARNOLD: Well, I'm not sure what you mean by my own knowledge, the
21 Governor did not contact me

22
23 MARTIN: What I meant was I heard I was not looking to pursue that I
24 heard that it was so-and-so that said that Jack should go to the
25 Governor's Office.

1 ARNOLD: Well, I would think that I

2
3 MARTIN: Something more certain than

4
5 ARNOLD: I would think that I knew Jack was going either because I
6 talked with Jack in that time period or I talked to Walt Kreitz and
7 Walter told me, but I, I'm fairly competent I knew about it with
8 enough assurance that I knew that Jack was not available.

9
10 MARTIN: That's the degree of assurance though?

11
12 ARNOLD: Yes.

13
14 MARTIN: At this point I want to turn it over to Al.

15
16 GIBSON: Mr. Arnold, I'd like to review for just a moment the types of
17 technical capability you have on your staff, and in particular I've
18 made a few notes to myself here to refresh my memory. do you have
19 radiation protection specialists on your staff? You or Dick Wilson?

20
21 ARNOLD: We have a large number of people within the organization who
22 had gone through the Navy nuclear power training program who had been
23 in the Navy's construction program, from the shipyards standpoint,
24 side of things and consequently had background in radiation protection
25 principles and practices. The only individual that we had who was,

1 who was specializing in that area in a staff position is Don Ruppert.
2 Don is a radiation protection specialist. I do not believe he is
3 certified, but I know that he is has experience equivalent for certification.
4 And he works for Jack Thorpe who is a manager of Environmental Affairs
5 and has and has responsibility for within his department for nuclear
6 licensing and for analysis, safety analysis, from the plant systems
7 outward to the environment. Dick Wilson's group handles the plant's
8 safety analysis and the in-plant safety analysis.

9
10 GIBSON: I see. Did, I know that later in the next week Jack Thorpe
11 did come to the site I met him here I'm not sure exactly when he
12 arrived, I think it was probably after our period of interest ends on
13 which is midnight the 30th.

14
15 ARNOLD: Jack Thorpe went to Reading on Thursday as a technical resource
16 to the Med Ed corporate staff for me. He returned I believe to New
17 Jersey, Thursday evening with my concurrence, and I don't believe that
18 I asked him to come to the site until early the following week.

19
20 GIBSON: Do you know if Don Ruppert responded and came to the site?

21
22 ARNOLD: Yes. Don Ruppert came out with Dick Wilson on Thursday.

23
24 GIBSON: Okay. How do you spell his name for the record? RUPPERT?
25

682 216

1 ARNOLD: Yes sir.

2
3 GIBSON: Can you describe briefly ah the expertise on the GPU services
4 staff for environmental surveillance? I'm thinking of environmental
5 monitoring, sampling, analysis of the environment impact?

6
7 ARNOLD: From a radiological standpoint?

8
9 GIBSON: Yes.

10
11 ARNOLD: We have a limited capability in that regard I would characterize
12 it we have utilized since before preoperational on Unit 1, TMI Unit 1
13 the firm of Pickard Lowe in Garytown in particular Keith Woodward,
14 Woodard, who I believe as a well recognized competence in this area.
15 Has been the chief architect and chief reviewer of our implementation
16 and execution of our environmental radiological monitoring. Metropolitan
17 Edison Company has on its staff a fellow by the name of Jim Mudge who
18 has a PhD in physiology and has worked in environmental monitoring of
19 various both types, i.e., both radiological and nonradiological for a
20 number of years. Michael Burling, BURLING, is also on the Reading
21 corporate staff and he has a background a background similar to Don
22 Ruppert although not as extensive.

23
24 GIBSON: These people that you are naming I assume that sometime or
25 other they were all involved in the response to the incident? Do you

1 know to what extent they were involved? When they reported to the
2 site if they did?

3
4 ARNOLD: Well let me first clarify that the offsite releases and the
5 implementation of the emergency plan for offsite surveillance of the
6 incident is predominately executed by the plant staff. The emergency
7 plan provides for required off-site monitoring. Michael Burling came
8 out fairly early, I imagine cause I, it seems at least in retrospect
9 that he was here when I was here. Initially we requested on Wednesday
10 the assistance of Radiation Management Corporation who were contract
11 and in fact this firm had been set up to assist in these kinds of
12 incidents to help and they arrived on Wednesday. So these people were
13 involved to varying degrees but the offsite release monitoring for a
14 real time basis was primarily being administered and executed by the
15 emergency plan team augmented by RMC Radiation Management Corporation
16 and I think perhaps I'm getting a little bit outside you know the area
17 of my first-hand knowledge. But there were probably others. The ...
18 I know from my own participation and you know, and subsequent review
19 of information that Pickard and Lowe, and RMC people and Jim Mudge
20 were involved in the analysis of the data that was gathered together
21 from our environmental monitoring stations. And that the the pickup
22 of that information was made on a daily basis and the information is
23 feed into our computer in Reading and was then available through the
24 termals in Reading.
25

1 GIBSON: Mr. Arnold, I have a list of the company names that we had
2 compiled and it may not be all inclusive but if you would scan the
3 list, perhaps it would help your memory, we are trying to establish
4 what type of support GPU Services did provide or arrange for during
5 the early days, one of these companies were not involved until later,
6 but looking down that list I note that you have already mentioned
7 several companies on the list, do you see any others that to your
8 knowledge which were arranged by GPU Services?
9

10 ARNOLD: I think even the most knowledgeable might have a difficult
11 time knowing exactly who made arrangements and to what extent various
12 companies sent people and we just agreed to it.
13

14 GIBSON: Okay.
15

16 ARNOLD: But clearly we were in touch with B&W and while they initiated
17 on their own initiative, while they took it upon themselves to initiate
18 a very substantial technical effort on Saturday at some time like
19 11:00 to 12:00, I personally talked with John MacMillen vice president
20 in charge of their Lynchburg division that supports Three Mile Island
21 and requested the full support of his technical capabilities and authorized
22 the use of the full supports available, full scope of support available,
23 to him for the incident. There was a lot of activity prior to that
24 going on? Obviously. Bechtel as I recall volunteered people and
25 initially and we said yes by all means come. I was not principally

1 involved in ... in making the contacts. I was aware of many of them
2 going on. And I could run through here and I'm sure that I could
3 identify 30 or 40 of the 100 or so that are here that I know that you
4 know the Service Company took the initiative to contact, but in many
5 cases, particularly from the other utilities there was either a telephone
6 call to offer certain kinds of assistance or to tell us we've sent
7 these kinds of people are on their way.

8
9 GIBSON: For the record, GPU Services did make arrangements for a
10 number of off site companies to assist in the recovery?

11
12 ARNOLD: Yes. For example I think by Friday afternoon, although again
13 it might not, be my memory is a little hazy, but by Friday afternoon I
14 think we had a dedicated phone lines from Dick Wilson's office to
15 Westinghouse, B&W, Combustion Engineering, and Westinghouse, into
16 their technical staffs. And he had as I say dedicated phone lines
17 picked up they had hot line types of arrangement into those technical
18 facilities.

19
20 GIBSON: Okay, Mr. Arnold one more question, you commented earlier
21 that the emergency plan is a site emergency plan, to your knowledge of
22 GPU Services does not have the responsibility assigned to this plan, I
23 recognize that to my knowledge they don't either. But from that I
24 would presume that most likely you had not made prior arrangements
25 with companies such as the ones on this list for emergency assistance
in a case like this. Is this generally the case?

1 AROLD: Yes, I think the requirement for offsite support arrangements
2 are were clearly delineated during the licensing process. We had
3 in place the letters of agreement that were identified as being necessary
4 to assure that certain kinds of support were available to plant staff.
5 That's not to imply that we were indifferent to the capabilities of
6 the service company and the other operating companies had to offer and
7 I think as the events from that day on would have demonstrated both
8 plant and the company in general felt quite free and to call upon
9 those services and the response was there. So that the nature of the
10 site and general emergency plan was directed to a certain extent to a
11 different view of how emergency conditions would develop.

12
13 GIBSON: I have no further questions.

14
15 MARTIN: I have no further questions.

16
17 MARSH: I have one or two items that I was concerned with. Sir, when,
18 to your recollection, do you recall you first received notification of
19 the water flow to the Aux Building?

20
21 ARNOLD: I think that some time during the ... during the day when I
22 was probably in a conversation with Herbein I was aware that there had
23 ah some water which had not been contained within tanks or sumps to
24 the point that there was water on the floor, veracular. And that the
25 sumps had been pumped down to take care of that and that they were

692 221

1 laying poly sheets to reduce the airborne contamination as the surfaces
2 dried. I recall that kind of a comment and I would expect that it was
3 probably in a conversation with Herbein that I was made aware of that.
4 But I'm not, I'm not really sure, to tell you the truth. I don't
5 think that at any time the first few days or for that matter now I
6 really see the water in the auxiliary building other than in tanks or
7 sumps which are intended to contain radioactive liquids as a substantial
8 problem.

9
10 MARSH: Had you been aware on the first day of the people in the
11 control room going to respirators?

12
13 ARNOLD: Not as far as I can recall.

14
15 MARSH: The final item I was interested in was omerested cm was when
16 did you become aware of the the spike?

17
18 ARNOLD: When I was picked up at the airport Friday morning at 8:15,
19 by Sandy Lawyer and Ron Williams, incidentally I didn't mention Ron
20 and previous discussions as to people who came out here but obviously
21 he was here as he met me at the airport, Ron is a senior consultant
22 who reports directly to me, has a extensive experience, and in riding
23 from the airport to the plant they mentioned that there had
24 apparently been a hydrogen explosion. It was frankly my impression
25 that it had occurred during the previous night that it had occurred

1 the day of the accident. They did not have any details on it. And
2 shortly after arriving at the plant we got pretty well swept up in
3 things so that I never really pursued it. I'm not even sure when I
4 recognized that it, I realized that it was a pressure spike that
5 occurred the day of the accident.

6
7 GIBSON: Mr. Arnold, I think this may have happened after our period
8 of interest and in which case I might be interested in it. Did GPU
9 Services make arrangements for Mr. Bill Graber and other from the,
10 from Electric Boat Division to come in and assist in management of the
11 health physics program here? Or was this, these arrangements made by
12 someone else? And when were they made?

13
14 ARNOLD: To the best of my understanding the the arrangements were
15 made between probably either Electric Boat or someone else who was
16 familiar with Electric Boat personnel and Herman DeCamp. I frankly
17 don't remember when Herman and I talked about it. But I do remember
18 that Herman identified that the person by title who eventually turned
19 out to be Bill Graber, would be available and that we also probably
20 could call upon assistance from others within the government who had
21 this type of background if we needed it. And my recollection is that
22 I certainly endorsed getting Bill to the site and that we should get
23 half a dozen or a dozen of people with sup health physics supervisory
24 kind of capability in as soon as he could. And whether that was
25 Friday or Saturday perhaps even Thursday, I don't know. I'm sure it

1 was after I'm sure it was Friday or later. It was probably Friday or
2 Saturday. But my recollection is that those people came as a result
3 of telephone calls that Herman DeCamp was involved with.

4
5 MARSH: Okay. I have to talk with Bill Graber onsite, perhaps he can
6 clear that up. Is there anyone else onsite who might know when the
7 arrangements were made?

8
9 ARNOLD: I think there is probably several who would know when he
10 arrived. I don't know for sure that there's probably probably Dave
11 Limroth might have some idea. I don't even remember who I told that
12 they were coming. I probably told Jack Herbein and Jack may recall
13 something about it but there were many many organizations with, making
14 offers of help and we initiating many contacts on our own and it
15 wasn't always clear at the time even where the, who was the initiator
16 of the conversations.

17
18 MARSH: Sir, we have about two minutes left on this tape and if need
19 be I'll put a new cassette on but as we've done with most interviews
20 towards the end I'd like to turn it over to you in case there's any
21 comments you want to make. Obviously we've trying to draw from these
22 interviews also any recommendations that we can profit from for the
23 future.
24
25

1 ARNOLD: Well my own feeling at this point is that its been a very
2 complex event and that the recommendations for fixes that should be
3 put in place really will come out of the indepth study and analysis
4 that are underway from a variety of organizations including our own.
5 And will be of considerable greater value than, the whatever ton of
6 the head comments I could make.

7
8 MARSH: If no one has anything else then the time being 10:29, meter
9 reading 416 which would be 1416, I will then terminate this tape. I
10 would like to say thank you for your time recognizing that you are an
11 exceptionally busy man, and we appreciate you coming in. I will
12 terminate the tape at 10:29.