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ADVISORY PANEL FOR THE DECONTAMINATION
OF THREE MILE ISLAND, UNIT 2

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1 UNITED STATES OF AMERICA
2 NUCLEAR REGULATORY COMMISSION
3 ADVISORY PANEL FOR THE DECONTAMINATION
4 OF THREE MILE ISLAND, UNIT 2

6 Environmental Matters Committee
7 Room 160
8 House of Delegates Office
9 Building
10 College Avenue
11 Annapolis, Maryland

12 Wednesday, September 11, 1985
13 6:10 p.m.

14 PANEL MEMBERS PRESENT:

15 ARTHUR MORRIS, Chairperson
16 THOMAS SMITHGALL
17 THOMAS COCHRAN
18 JOEL ROTH
19 NIEL WALD
20 JOSEPH DI NUNNO
21 KENNETH MILLER
22 THOMAS GERUSKY

23 ALSO PRESENT:

24 BERNARD SNYDER, NRC
25 FRANK MIRAGLIA, NRC
BILL TRAVERS, NRC
RANDY HALL, NRC
FRANK STANDERFER, GPU
JACK DEVINE, GPU
WILLIS BIXBY, DOE

UNITED STATES NUCLEAR REGULATORY COMMISSION
ADVISORY PANEL FOR THE DECONTAMINATION OF
THREE MILE ISLAND UNIT 2

Agenda for the September 11, 1985
Meeting in Annapolis, MD

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P R O C E E D I N G S

MR. MORRIS: Good evening. I would like to call the meeting of the panel to order.

I have some very brief introductory remarks this evening. I would like to welcome everybody to this meeting. Just to explain in a few words what the panel is about for those that have not been to panel meetings before, we have been in operation I believe since late 1980. We meet, at least initially we were meeting something like six or seven times a year. More recently we have been meeting monthly. We are established by the NRC to provide public comment on cleanup activities for TMI unit 2. We meet with the commissioners several times a year to update them, and we raise any concerns that we have with the NRC.

The reason the meeting has been scheduled in Maryland is that, is because in the past a person by the name of Henry Wagner, who is a member of the panel, raised concerns from the state of Maryland, particularly in regards for the potential for dumping of the water that is now on the island. It has not been decided just how that water will be disposed of. Dr. Wagner had raised concerns and voiced opposition to any option regarding dumping the water into the Susquehanna River which ultimately would find its way to the Chesapeake Bay.

Because of that past concern, because we have

1 never met in Maryland before, we thought it would be
2 advantageous for both the panel and the public if we would
3 schedule the meeting in Maryland. That is why we are here
4 this evening.

5 That completes my initial comments. I would
6 like to go to the second item on the agenda. That is the
7 status of the TMI-2 cleanup. That will be given by General
8 Public Utilities. Since most of the panel members do not
9 have mikes this evening, if you cannot hear us, please wave
10 or something like that and we will try to speak louder.

11 MR. STANDERFER: I am director of the cleanup,
12 GPU Nuclear. A brief summary of status of the project.
13 The last meeting I mentioned that we were having some
14 trouble with late delivery of some of the reactor
15 components. The transfer shield inside the containment
16 which transfers the cannisters from the reactor to the pool,
17 transfer shield outside of the reactor -- the other one.
18 That transfers the cannisters into storage and then the
19 storage racks at the bottom of the pool.

20 Since that July meeting, the first three storage
21 racks have been delivered. The fourth storage rack was
22 shipped today. The fuel transfer shield inside the fuel
23 handling building has been delivered and it is mounted and
24 being assembled and tested in the fuel handling building
25 now. The second transfer shield will be shipped Saturday.

1 I also talked about cannisters and indicated
2 that the cannisters were placed with the same -- the
3 building contractor's shop was overloaded. At that time
4 the 250 cannisters that have been ordered, they are broken
5 down to 77 fuel cannisters, 33 filter cannisters and 134
6 knockout cannisters. They go on the vacuum system for 250.
7 Since that time we have split that order and 81 of the
8 original 250 are still with the original vendor. 21
9 cannisters are all filter cannisters are now being
10 completed by Babcock & Wilcox. Oat in Philadelphia has 148
11 and we ordered 30 more cannisters from him so the total
12 cannisters on order now are 280.

13 With regard to schedule, at the last meeting on
14 July 18, I indicated because of these equipment delivery
15 questions, we were no longer going to be able to start
16 defueling in September. We were looking at starting
17 defueling in October. Now that we have those components in
18 hand or will be receiving them this week, our schedule now
19 has been put together and we are looking at starting the
20 defueling the last week of October, which is the schedule
21 on the bottom of this handout that you have.

22 Another significant activity that was just
23 completed last month was a review of the cost estimate for
24 the cleanup program. After -- a year ago after the new
25 defueling concept was agreed to and was put in place, the

1 estimate was reviewed. A year ago we concluded that the
2 cleanup would be completed in the third quarter 1988. Cost
3 estimate at that time was \$967 million. The cost estimate
4 review that was just completed in August still indicates
5 that the cleanup will be completed third quarter '88, total
6 program cost of \$965 million. It is broken down slightly
7 differently, but basically the cost estimate has held over
8 the last year. Each of you will be getting a copy of that
9 estimate as it comes off the press this month.

10 Another question that we have been getting the
11 last two or three meetings is the status of receiving
12 funding from the private utilities, the EEI funding. I
13 indicated that we had received \$20,900,000, of the \$25
14 million for 1985.

15 At the end of July we received another payment
16 of \$3 million. The current receipts from EEI is
17 \$23,914,823. The remaining is about a million dollars to
18 add up to the 25 million for this year.

19 One other thing I would like to mention, last
20 month, we made a number of management changes,
21 organizational changes on the project to get ready for the
22 activities that are going to occur over the next two years.
23 At the end of the year we will have completed most of the
24 design and construction kinds of activities. We will be
25 doing operating kinds of activities. Of the activity left

1 to go over the next three years, it is about one-third
2 devoted towards defueling, one-third devoted towards
3 decontamination and about one-third devoted towards
4 handling waste, packaging and shipping waste. So it is
5 broken down roughly a third, a third, a third between
6 defueling, waste management activities.

7 Last month I took the three different groups
8 working on decontamination activity and combined them into
9 a single organization headed with a decontamination project
10 manager. There were five different activities on the
11 project under different organizations doing waste
12 management work. They have been combined under a single
13 waste management head. So we are starting to consolidate
14 the organization to address the operating activities that
15 will be the main thrust over the next three years.

16 The remainder of my time, if it is not used, I
17 think Jack Devine would use more than 15 minutes for his
18 presentation on the -- for the 20 minutes for the
19 presentation on the water activities.

20 MR. SMITHGALL: Your source of funds beyond, for
21 1985 or '86, you talked about EEI. How do the other
22 sources of funds stand as far as --

23 MR. STANDERFER: Again, I am sure you have seen
24 funding rack up there, funds from GPU. There are funds
25 from the states of Pennsylvania, New Jersey; funds from

1 Japanese, funds from the DOE and funds from EEI. We -- I
2 believe all the insurance funding has been received. Those
3 continue to be in place.

4 I have a budget of \$126 million next year. I
5 show this because as you may remember, this was the last
6 piece of the funding that got put in place about a year ago.
7 There had been some question as to whether the contributing
8 utilities would contribute and if not, then the
9 Pennsylvania and New Jersey utilities would make that
10 difference up through deducting that from some of their EEI
11 contribution. It is my understanding that the contributing
12 utilities have contributed this year and we expect \$25
13 million a year from them for the next six years.

14 MR. SMITHGALL: You are saying the customer
15 rates are staying close to the schedule that you gave us?

16 MR. STANDERFER: Yes.

17 MR. SMITHGALL: 55 million for '85 and 49
18 million for '86?

19 MR. STANDERFER: I don't know what you are
20 looking at.

21 MR. SMITHGALL: The schedule that you had given
22 us, I guess it was in -- I am not sure of the date of it.

23 MR. STANDERFER: There is a schedule from the
24 different sources.

25 MR. SMITHGALL: Yes. It outlines all the

1 sources.

2 MR. STANDERFER: Those are in place.

3 MR. MORRIS: Any other questions?

4 MR. ROTH: On the list of your organizational
5 changes, names, you said that we will receive a copy.

6 MR. STANDERFER: I can provide you with that.

7 MR. ROTH: In other words, names to go along
8 with titles.

9 MR. STANDERFER: The copy you will receive is
10 the new project estimate which is a complete breakdown of
11 the work left to go and of the costs and schedules and that
12 sort of thing.

13 The I mentioned the organizational changes.
14 There really is a recombination of internal activities to
15 be more efficient as we move into the next operational
16 phases.

17 MR. ROTH: People who are already there?

18 MR. STANDERFER: No. The decontamination
19 activities, for example, was an engineering activity, an
20 operating activity and a planning activity in three
21 different organizations. I put them together. They are
22 now headed by Paul Bengal who was a functional or a matrix
23 project manager who had nobody reporting to him, but he was
24 a matrix project manager over these activities as they were
25 in different organizations. Now they have been put

1 together. He is the project manager and directly controls
2 that activity.

3 The consolidated waste management activities,
4 again there were five spread through the organizational
5 planning activity, two handling activities and a shipping
6 activity. They have been put together under Jim Renshaw
7 who had been an engineering manager and radiation control.
8 So again, it is an evolutionary kind of activity to get the
9 project organized to address the activity we expect next
10 year.

11 MR. MORRIS: Anybody else?

12 Frank, you said another 20 minutes might be
13 needed for the explanation of the water disposition. That
14 is the item that would come under item 8?

15 MR. STANDERFER: Yes. That is scheduled for 20
16 minutes. I think we would prefer 30, if he can use some of
17 my time.

18 MR. MORRIS: Okay. Fine. Thank you.

19 Let me just mention before we go to item 3,
20 which would be the NRC oversight role, I should have
21 mentioned this at the beginning but the Commission has
22 approved the revised charter for the advisory panel to
23 allow the panel to provide advice on the public's reaction
24 to the plans and results of certain health effects
25 regarding the TMI-2 accident. That is something we asked

1 them to do the last time we met with them. We have been
2 notified that we can, we will be permitted to do it.

3 However, prior to final approval, all final
4 approval has to be given, I believe, to the charter by the
5 General Services Administration. It is my understanding
6 that a letter has been sent to them. Bernie, if you are
7 the one that would be talking to us or Bill, if you have
8 any update as to where that stands, I would appreciate
9 hearing. Until we have final approval, we are proceeding
10 as if we do.

11 If anybody has an update on where that stands,
12 we would like to hear it, if possible.

13 Who will be giving the presentation?

14 MR. SNYDER: I am going to start and then
15 introduce some other members.

16 I am Bernie Snyder, the NRC director of the TMI
17 program office who has the oversight responsibility for
18 regulating cleanup. With regard to your question, my
19 understanding is that the letter to GSA has been sent and
20 it takes a little while for them to act but I think it is
21 more pro forma than anything. So I think for your purposes,
22 I think it is -- you probably ought to assume that your
23 charter is as proposed to be amended and proceed as you
24 choose along those lines.

25 For the benefit of members of the public in

1 Maryland, I am going to spend just a couple of minutes
2 explaining a little bit what our role is and we did bring
3 along a few things that we have put together in the recent
4 past. There are two blue booklets in the back. One of
5 them is the NRC plan for cleanup operations at TMI-2. They
6 are there for your taking, if you are interested in reading
7 them in a little more detail how we operate. That
8 basically is what does the NRC do and how do they go about
9 carrying out their responsibilities.

10 In addition, we have revised within the last six
11 months or so a document which is a Q and A document about
12 the cleanup which I think most people find fairly
13 interesting. It is reasonably up to date.

14 This is something that we actually revised it
15 and requested the panel. If any members of the panel would
16 like copies, we have got more in the back probably than
17 there are people that are here at the moment.

18 Also I would like to mention that there are
19 copies of the agenda at the entrance to the meeting.

20 The NRC is the lead government agency for
21 overseeing the cleanup and providing approvals for the
22 licensee who is GPU Nuclear, the owners and operators of
23 the facility. It is a unique arrangement in that we have a
24 fairly large contingent of NRC people, both at the site and
25 currently in Bethesda at the NRC headquarters.

1 There are approximately 20 people in my office
2 at the moment. The site office is about two-thirds of that
3 and about one-third are in Bethesda.

4 Basically what we do is review and approve the
5 cleanup activities and inspect the company's carrying out
6 of those activities as well as carrying out of certain
7 surveillance requirements that are in their license; and we
8 have a very large on-site presence, as I mentioned, to
9 assure that the public health and safety is protected and
10 that the environment is also protected, which is basically
11 the NRC's charter in all licensed reactor facilities.

12 It is the company's responsibility to carry out
13 the cleanup and our responsibility to oversee those actions.

14 The uniqueness also comes about in that in this
15 case, as opposed to a normally operating reactor, we
16 actually approve and it is a condition of their license
17 that they require our approval before they can proceed with
18 any major cleanup activity. That is not normally the rule
19 that the NRC place at a normal reactor facility, but this
20 one is unique and, therefore, we instituted not only an
21 independent project office like mine but a fairly tight
22 control over the activities.

23 We have many interfaces with other government
24 agencies -- and DOE will be speaking after me -- with the
25 Environmental Protection Agency and with the state, et

1 cetera, and local government agencies.

2 I wanted to mention now, for the benefit of the
3 panel primarily, that to answer any questions that you
4 might have or reinforce the note that Mike sent you, Mike
5 Maznick who isn't here tonight sent you on the 20th of
6 August with regard to a change in arrangement in our office.
7 We can make copies available for members of the public that
8 are interested.

9 At the end of July, my boss Harold Denton, who
10 is director of the Office of Nuclear Reactor Regulation,
11 did inform the NRR, informed the NRR employees that a
12 reorganization of his whole office, of which my office is a
13 small part, would be taking place in the near future. That --
14 the changes I am talking about haven't quite been
15 implemented yet but are well on the way and probably in the
16 next month or so they will be taking effect.

17 The effect on our office is that the focus of
18 our activities is going to shift from the headquarters in
19 Bethesda to the site. And in fact, the director of the
20 office will eventually be located there and probably in the
21 next few months before that arrangement is put into effect.

22 I will not be that individual. I want to make
23 that clear from the first. Of course, as you know,
24 Dr. Travers is sitting on my right and has been my deputy.
25 He will remain at the site and presumably will be acting in

1 the position as director of the office. But there is a
2 formal procedure that has to be gone through to select a
3 new director.

4 The office function that is being shifted up to
5 the site and the management of our activities is basically
6 because the action is really there now. That is where it
7 ought to be. During the defueling and the rest of the
8 decontamination work that needs to be done it should be
9 there.

10 The staff will be reduced somewhat. There will
11 be a net reduction of four over what we currently have. So
12 there will be -- and there are some vacancies with an
13 office that size, there is always a little bit of turnover.
14 But basically there will be a total of approximately 15
15 people involved.

16 There will remain back at Bethesda a small
17 two-person contingent to serve as a liaison function back
18 to the home office organization, but those two individuals,
19 as it is presently set up, will report to the director who
20 will be at the site. They will provide service function to
21 him.

22 Importantly for the panel's information, Mike
23 Maznick will remain in Bethesda and will remain as liaison
24 to the panel. So from that perspective, the interface with
25 the panel really will not change.

1 The other individual who will remain in
2 headquarters is Randy Hall, who is sitting in for Mike
3 tonight who is at military training this week. Between the
4 two of them, they will provide all the support that the
5 site office needs.

6 As I say, the primary emphasis was to put the
7 director where the real action is going to be in the near
8 future and through the end of the cleanup.

9 The director will report in to slightly
10 different arrangement. Whereas I reported and still report
11 until this change takes place to Harold Denton, who in turn
12 reports to our executive director, the new director at the
13 site office will report to a gentleman who is with us
14 tonight. I want to introduce them very shortly: Frank
15 Miraglia, who in turn reports then to Harold Denton. So it
16 is a change in that arrangement. But I think the important
17 thing is that you have got the director on the site and I
18 don't see that that operation will change all that much.

19 More importantly, the arrangement which I am
20 going to ask Frank to explain, under his office it has
21 available a fairly large staff of technical people that
22 service a number of different projects in his area of
23 responsibility. That is something we have never had before.
24 So I think that that is a real plus in this organization,
25 that we can call upon, more readily call upon technical

1 specialists that may not be within our office organization
2 all the time.

3 If there are any questions on the subject, I
4 would be happy to answer them. If not, I was going to
5 suggest that we have Frank Miraglia just explain a little
6 bit better how this fits into the whole slew of things.

7 MR. MORRIS: Any questions from anybody?

8 Okay. Thank you, Bernie.

9 MR. SNYDER: Frank.

10 MR. MIRAGLIA: This is an organizational chart.

11 MR. MORRIS: While all this is being handed out,
12 are you going to tell the panel what it is you are going to
13 be doing or is that your business?

14 MR. SNYDER: The only thing I can answer is that
15 is I can tell you what I am not going to be doing. I am
16 planning on leaving the NRC and my plans very honestly are
17 not firm at this moment. I was thinking of running for
18 mayor of Lancaster, but I really don't think I could beat
19 you.

20 (Laughter.)

21 MR. MORRIS: You might do real well. I wasn't
22 sure that the panel members realized that you were in fact
23 living. Are you going to be at the next meeting?

24 MR. SNYDER: I will try to be there. I expect
25 to be able to be there and go through the same thing for

1 the benefit of the people in the Harrisburg area. It just
2 so happened that this meeting was scheduled coincidentally
3 with the time that we made this reorganizational plan.

4 MR. MORRIS: I don't want to see you leave
5 without the panel thanking you and if you are going to be
6 in Harrisburg, then we can --

7 MR. SNYDER: Give me an appropriate greeting
8 there.

9 MR. MORRIS: Seriously, we would be happy to do
10 that. I want to. I don't want to see you just leave
11 without acknowledging your work with the panel. But if you
12 are going to be in Harrisburg, we should leave it until
13 then.

14 Frank?

15 MR. MIRAGLIA: Thank you. My name is Frank
16 Miraglia. I am currently deputy director of licensing
17 within the division. As Bernie has outlined, the overall
18 Office of Nuclear Reactor Regulation is being reorganized.
19 The current status of that reorganization is a detailed
20 staffing plan has been developed and it has been processed
21 through personnel and management and the staff will
22 probably be receiving notification of the roles of all the
23 individuals within the office sometime in October. We
24 still have a target and a goal of early October. It will
25 be shortly thereafter, if not on that target.

1 As with any reorganization of the size
2 contemplated, there will be a period of transition until
3 the new organization becomes fully effective and working.

4 I have provided the panel the announcement of
5 the reorganization that was made by Mr. Denton at the end
6 of July. The charts in this handout only go to the level
7 of management and down to the branch chief level. It
8 doesn't show the full staffing.

9 I don't propose to walk you through all of those,
10 but the very first chart gives you an idea of the overall
11 organization that will exist in NRR after reorganization.
12 There still will be five divisions within the office, but
13 the complement and makeup of those divisions will be
14 different from the existing five divisions. There will be
15 three projects divisions, one division is called
16 pressurized water reactors licensing-A, that essentially
17 will have the responsibility for all of the Westinghouse
18 pressurized water reactors.

19 There will be a division of boiling water
20 reactors that are essentially the GE reactors. And there
21 is also the Alice Chalmers reactor at La Crosse.

22 The division of most interest to the panel will
23 be the division of pressurized water reactor licensing-B,
24 and that will have responsibility for the Babcock & Wilcox
25 design pressurized water reactors as well as the combustion

1 engineering reactors.

2 In addition, there will be a division of safety
3 review and oversight and a division of human factors
4 technology.

5 I think that you can turn about three pages back
6 from that first chart and this will give you an idea of the
7 size of the organization, of the division of pressurized
8 water reactors licensing-B.

9 We struggled hard to try to come up with a
10 better name than that, but it is the best we can do.

11 In that division, I think an important point
12 that Bernie made is that it is set up in that each division,
13 not only does it have the responsibility and houses the
14 project managers that follow each of the reactor projects
15 but it is also concerning a technical staff. That is
16 different from our current structure. We have a matrix
17 structure of a project management organization which is the
18 current division of licensing with the technical
19 disciplines in three or four different divisions. Those
20 technical divisions serve as all of the project pointers.

21 The reorganization does align projects and
22 technical functions within the division. The size of this
23 division will be about 150 people. There will be
24 approximately 70 people on the technical side and the equal
25 amount on the project side.

1 One of the project directorates will be the TMI
2 program office directorate, which the activities will be
3 housed at the site with support staff in Bethesda of two
4 persons, Mike Maznick and Randy Hall. So Mike and Randy
5 will provide the liaison with the site but they will also
6 have the access to the technical organization that is
7 housed in that division.

8 Within that technical arm, there are four
9 technical branches. We have an engineering branch and the
10 sizes of those organizations are on the order of 15 people.

11 Engineering branch we also have a reactor
12 systems branch, a plant and electrical systems branch and a
13 facilities operations branch.

14 In addition to the project directorate of the
15 TMI cleanup project, there are five other project
16 directorates from which I will be responsible for, one
17 being directorate number 6 which is all of the B&W reactors
18 including the activities at TMI-1.

19 The project directorate of number 7 will have
20 combustion engineer reactors. Those are the newer designs:
21 Palo Verde, San Onofre, Waterford. The project directorate
22 8 would be the combustion engineering reactors of older
23 vintage: Maine Yankee, Millstone, Calvert Cliffs also.
24 For the people here in Maryland, Calvert Cliffs would be in
25 that project directorate.

1 In addition to those, there are two other
2 programs that would be assigned to that division. One
3 would be the safety assessment project directorate which
4 will have two projects. It is a pilot program that we are
5 attempting to demonstrate a technique for reexamining older
6 reactors and to look at the requirements that are
7 outstanding on the reactor to see what is the most
8 expeditious and cost-effective way of implementing the
9 requirements and upgrading perhaps some of the older design
10 facilities. The two projects that are in that directorate
11 right now would be Haddam Neck and Millstone 2.

12 The special projects and standardization project
13 directorate will have responsibility for non-power reactors,
14 standardization and decommission.

15 That gives you a broad overview of the
16 organization in Washington. As Bernie has pointed out, the
17 one plus of this reorganization is a dedicated staff of
18 technical people for the program office to draw upon.

19 They had a dedicated staff previously. However,
20 they were in competition across, from a priority point of
21 view in competing with all the reactor types.

22 So I think the priorities and the reassignment
23 of people will be able to focus on the B&W reactors perhaps
24 a little bit more effectively.

25 I have had the pleasure of meeting Mayor Morris.

1 I was introduced to some of you previously before the
2 meeting. I look forward to seeing you at some of the
3 upcoming meetings.

4 MR. MORRIS: Thank you.

5 Anybody on the panel have any questions at this
6 point?

7 MR. DI NUNNO: Frank, I think from a public
8 standpoint, public interest standpoint that one needs some
9 assurance that this reorganization which one can understand
10 from a technical standpoint will not in any way degrade the
11 attention to the interest or reflect a lack of interest, if
12 you will, in any way on the part of the Regulatory
13 Commission. I think that the public would want some
14 reassurance that this is in no way a diminishment of the
15 interest of the NRC in the entire program.

16 The other aspect that you might want to comment
17 on, I would like to have your comments on, is the TMI
18 experience is an experience that is of interest to the
19 total reactor technology and certainly not just the
20 combustion and B&W designs. So one of my questions is, how
21 does that experience fit into the other reactor concepts,
22 the other reactor designs as well. I would hope that
23 having this unit reporting to you that is specializing in
24 like reactors will not lessen the flow of whatever comes
25 out of this cleanup activity in the way of experience in

1 the rest of the reactor technological community.

2 MR. MIRAGLIA: Let me try to respond to those.

3 The question about the emphasis, that concern
4 and that perception would be perhaps a reporting level of
5 the director of the office to a division director and then
6 to the office director. That could be perceived as a
7 de-emphasis.

8 I think in the establishment of the office and
9 the staffing of the office, extra consideration for
10 staffing has been considered. In addition to myself as the
11 division director, I myself have a deputy assigned to the
12 division so between the two of us, along with Bill and the
13 two extra support staff in headquarters, I would hope that
14 we would be able to maintain the appropriate focus and
15 emphasis. I am sure that this panel will be watching the
16 performance of this new organization and will not hesitate
17 in making comments or expressing those kinds of concerns.
18 I don't believe it is a de-emphasis. I think the focus has
19 shifted to the site and I think the shift to the site has
20 been contemplated for some time, even separate and apart
21 from such a reorganization.

22 With respect to your second comment, I don't
23 think that the focus of the experience at TMI is going to
24 be limited to the B&W reactors in any sense. I think
25 within the community with respect to the support by DOE,

1 our Office of Research and disseminating the information
2 that has been gained and looking at the experience that is
3 coming out of TMI-2, TMI-2 is a unique experience and there
4 is a lot to be learned from it. I think we have learned a
5 lot since the accident, a lot of changes have been made at
6 the reactors of all types. Certainly consideration of new
7 designs.

8 I think the organization also provides some
9 other unique opportunities in that I have, along with
10 Bernie's help, tried to maintain the experience of some of
11 the people that -- the reductions that Bernie talked about
12 in staff. I made sure that I got as many of those people
13 within my organization, because the fact that they are not
14 assigned to the TMI-2 project in my mind is not important.
15 Those people will be in my organization and their expertise
16 will be available regardless of where they sit within that
17 organization. I think that will be true even of
18 individuals that might sit in other divisions as well.

19 In addition to that, as I say, one of the
20 project directorates that I have here is a special projects
21 directorate that has a decommission kind of function, to be
22 a focus for decommissioning kind of activities. There is a
23 natural link-up between the activities that are being
24 conducted with respect to TMI-2 and that general program.

25 I understand your concern and how the

1 reorganization might be perceived. It is my goal not to
2 let that happen as a matter of fact, regardless of the
3 perceptions. I am sure with your assistance, together we
4 will make sure it won't.

5 MR. DI NUNNO: Thank you.

6 MR. COCHRAN: Does the reorganization at the
7 TMI program office level or the NRR level reflect or was it
8 triggered by budget reductions?

9 MR. MIRAGLIA: Yes, a certain amount of that
10 certainly came into that consideration. The budget
11 reductions are a factor in federal life, state life and
12 local life. There was consideration of where to make
13 certain reductions. Various options were looked at and
14 discussed with the Commission. This is part of those
15 reductions.

16 MR. COCHRAN: Could you give us those numbers,
17 sort of the before and after for TMI and NRR?

18 MR. MIRAGLIA: Before and after TMI, you mean --

19 MR. COCHRAN: Before and after reorganization.
20 How much money -- the reorganization is to save money. How
21 much money --

22 MR. MIRAGLIA: I am not sure from an agency
23 point of view what those numbers would be. But from an
24 overall NRR perspective I can give you some gross numbers
25 and don't hold me to the absolute accuracy of these things.

1 For the last two to three years, the Office of
2 Nuclear Regulation has been relatively flat. The overall
3 staffing of the office itself has been about on the order
4 of 640 persons. I think this year we will come out
5 probably in the 638, 636, that kind of area. In addition,
6 there have been some reductions in the technical support
7 and assistance and dollars that were available. So it is a
8 question of overall office needs and the allocation of that
9 essentially constant pool of resources that Mr. Denton has
10 to work with that 640 total number. It is a reallocation
11 and redistribution of those numbers within that overall
12 constraint.

13 MR. SMITHGALL: Should I assume from your
14 comments that your policy of May of '85 of providing
15 information to the panel, relevant and significant
16 information to the advisory panel, pretty much stays the
17 same? Does that have to go through another review process?
18 Will it still come through our liaison?

19 MR. MIRAGLIA: That is correct. As far as all
20 the agreements that have been reached in the working
21 arrangements that have been reached with the panel, they
22 will remain unchanged. Mr. Maznick will continue to be
23 federal designate for the panel and I don't see any changes.

24 MR. SMITHGALL: No difference in the approval of
25 possibly nonpublic information on that to the panel as it

1 may be reviewed on a case-to-case basis?

2 MR. MIRAGLIA: None that I am aware of.

3 MR. SNYDER: I don't think that is going to be
4 affected. In fact, that policy is still under
5 consideration by the Commission, as you probably are aware.

6 I wouldn't want to predict how that might come
7 out. However it comes out, I don't think the relationship
8 will really change all that much. You will see Maznick,
9 you will see a different person in my job, but most of the
10 faces you will be pretty familiar with.

11 MR. MORRIS: You are not willing to predict,
12 even though you are leaving next month?

13 MR. SNYDER: That is, those two things really
14 aren't connected. I could take a flyer, I guess. But
15 based on the past performance that we are all familiar with --

16 MR. MORRIS: You are better off?

17 MR. SNYDER: You are better off not saying anymore.
18 Anybody else?

19 MR. MORRIS: Okay. I know you won't answer this:
20 Is the director's spot, is that one that is always highly
21 competitive and sought for or does Bill have a pretty good
22 shot at it?

23 MR. MIRAGLIA: I don't believe it would be
24 proper for me to comment. But certainly, filling of that
25 position will be pursued and all qualified candidates will

1 be considered.

2 MR. ROTH: Spoken like a true politician.

3 MR. MORRIS: I wasn't trying to put anybody on
4 the spot. I didn't know if it was just a technicality or
5 whether it was competitive. Fine. Thank you.

6 Next item 4 is DOE's role in the cleanup.

7 MR. BIXBY: I will touch on part of your
8 question which you asked Frank from DOE's perspective
9 during my presentation.

10 Mr. Mayor, when Bill called me about the agenda,
11 he said basically 15 minutes of commercial air time. So I
12 decided I would use that. Let Bernie into the secret of
13 what we do before he leaves.

14 (Laughter.)

15 MR. BIXBY: Seriously, I would like to spend the
16 next 15 minutes telling you who we are, where we come from,
17 what our mission is, what we have done, how we get it done
18 and what our current focus is.

19 I happen to be employed by the Department of
20 Energy's Idaho operations office and that office, through
21 its prime operating contractor EG&G Idaho, operates the
22 Idaho National Engineer Laboratory. The INEL is located in
23 southern Idaho, about 50 miles west of Idaho Falls. And up
24 until about 10 years ago, the INEL was known as the
25 National Reactor Testing Station. It derived its name from

1 the fact that that was the site at which many of the
2 reactors that were designed, tested and demonstrated before
3 commercial deployment during the late '50s and the early '60s.

4 Along with that program also evolved a large
5 expertise for reactor safety research. That has been
6 manifested in two major facilities, one the Loss Of Fluid
7 Test Facility, which is a 150th test facility. And you may
8 be aware, the people in the public may be aware that about
9 two months ago, the LOFT facility conducted its final test
10 of 38 in which it tried to simulate the TMI-2 accident and
11 achieved a fuel melting temperatures. In fact it did. I
12 would expect that within about six to eight months we ought
13 to have some preliminary results available for the panel.

14 There is also another facility referred to as
15 the Power Burst Facility. That facility is important
16 because it provides data on the performance of light water
17 reactor fuel under severe accident conditions. That
18 facility, both facilities, I should point out, have been
19 funded by the NRC as part of their confirmatory research
20 program, except in the recent LOFT has been funded by the
21 Organization for Economic Development. They will provide a
22 significant data base for questions associated with source
23 term.

24 In part because of that reactor safety expertise
25 and also with respect to the fact that DOE was the lead

1 laboratory for the low level waste management, the
2 department asked us to set up a site office at TMI. In
3 January of 1980, I and six other EG&G employees came back
4 to set up a site office. You can tell how temporary that
5 assignment has been but hopefully we are seeing the light
6 at the end of the tunnel.

7 Just what is our -- what was the DOE's mission?
8 It has been to obtain data to enhance reactor safety along
9 the lines that we have talked about with respect to LOFT
10 and PBF. And to provide recovery.

11 When we came here, this was our, principally our
12 only charter was to obtain data to enhance reactor safety.

13 That function has really been focused and is
14 taking on increased focus to assess where the fission
15 products were transported during and following the accident.
16 The reactor vessel containment building and the auxiliary
17 building and also to obtain information to understand how
18 TMI arrived at its final state. Both of those two pieces
19 of information, the data from that examination, will
20 provide data along with LOFT and PBF to allow us to
21 validate current generation computer codes used in design
22 and licensing of current generation PWRs and current
23 generation LWRs.

24 In addition we also have the -- in addition we
25 also have a charter to look at the performance of the

1 instrumentation and electrical components to get an
2 assessment as to its ability, the ability of those
3 components to meet their intended design. We are
4 essentially done with that. But that program provided a
5 significant contributor to the first issue, which is the
6 source term validation of the accident progression. Even
7 though many of the instruments may have died, when they
8 died and how they died are important in understanding what
9 actually happened during the course of the accident.

10 As we get more data, we are going to be able to
11 go back and hopefully reconstruct to a finer level of
12 detail what actually occurred during the course of the TMI
13 2 accident.

14 This really was our charter from January of 1980
15 until about the summer of 1981, just after the Reagan
16 administration came in. We included the second part of the
17 mission to provide technology for the recovery from
18 significant accidents. This is a two-way street, providing
19 technology.

20 The department has technology that existed in
21 its national laboratories, particularly with respect to
22 waste management -- the ability to be able to handle high
23 specific activity waste, high transuranic waste, and that
24 expertise was brought to bear at TMI-2. I will touch on
25 some specifics in a minute.

1 The other way of the street is the reactor
2 disassembly activities. That is the effort that GPU is
3 going through right now. DOE wants to take that technology
4 and be able to document it and make it available to the
5 private industry as well as the NRC. That technology, so
6 that in the event this happens again, that we will at least
7 have a leg up on how we go about handling this problem.

8 We work with GPU in two ways. We provide a
9 direct technical support to GPU. And like I said, this is
10 a 15-minute commercial.

11 MR. ROTH: Who is paying for it?

12 MR. BIXBY: The panel asked for it.

13 MR. MORRIS: Go for it, Ross.

14 MR. BIXBY: Back in 1980 when we first got here,
15 one of the concerns in the public was the, I guess the
16 believability of the public, of the federal agencies to be
17 able to believe the radiation readings that were being
18 monitored off-site, both EPA and NRC. One of the ideas
19 that came up was to let the people in the local communities
20 measure for themselves what the releases were during the
21 krypton venting.

22 DOE provided equipment to 12 cites around TMI,
23 sponsored a course through Penn State to educate 50 people
24 in the area and they were able to conduct their own
25 monitoring during the krypton venting.

1 With respect to the water that was processed in
2 the auxiliary building, GPU used the EPICOR system,
3 generated 50 high specific activity liners. There was some
4 concern immediately after those liners were put in storage
5 that they may have the potential for leaking. So the best
6 thing to do is to get one out and to analyze it. We
7 shipped one to Batelle Columbus, analyzed it there.
8 Determined that there needed to be means to safely vent and
9 inert these liners. That equipment was provided by DOE.

10 We also made arrangements and shipped all 50 of
11 those liners to the INEL. Put them in interim storage
12 until a commercial solution was developed.

13 That solution was a high integrity container.
14 We commercially disposed of one last May. And subsequent
15 to that, 46 out of 50 have been placed in the commercial
16 burial ground in Richland. That was done at GPU's expense.

17 MR. COCHRAN: I just got in the mail a copy of
18 this request for a license exemption. Is that related to
19 burial at EPICOR?

20 MR. BIXBY: No, I think that is different --
21 that is the strontium request.

22 MR. COCHRAN: What is the difference?

23 MR. BIXBY: Can you speak to that?

24 MR. STANDERFER: Basically there is the ratio of
25 strontium in some of the low level waste is different than

1 the normal commercial waste and while staying within the
2 total curie level for the site, we have asked for exemption
3 to allow the strontium contribution of the total be higher.
4 That exemption is for EPICOR-2 resin that we are now
5 sending to the Washington State burial ground has been
6 approved.

7 MR. COCHRAN: Have there been any variances
8 requested or approved with respect to the EPICOR?

9 MR. STANDERFER: I don't think so.

10 MR. MORRIS: Who are you asking the questions to?

11 MR. COCHRAN: Anybody.

12 MR. BIXBY: I think you have got to separate the
13 problem into two. One part of the problem is the low level
14 EPICOR liners that GPU has routinely generated. We are
15 talking about the high specific activity EPICOR liners that
16 had upwards of 2000 curies of activity on possible high
17 transuranic contents. DOE licensed that HIC through the
18 state of Washington.

19 MR. COCHRAN: And with no variances requested
20 with respect to that?

21 MR. BIXBY: Not that I am aware of, no.

22 When it came to processing the water in the
23 basement, they used the SDS system. DOE through the Oak
24 Ridge National Laboratory used those services to determine
25 what the right ion exchange medium was.

1 We also conducted a loading study to provide
2 guidance to GPU on how high they should load those SDS
3 liners and they were going to generate about 60. That
4 study said somewhere -- you can probably load them to get
5 somewhere between 10 and 20. It turned out to be 19. DOE
6 took all 19 of those SDS liners. We used three as part of
7 a glass-making demonstration at Richland and we used the
8 remaining 16 as part of a monitored and treatable burial
9 demonstration program.

10 Finally with respect to reactor disassembly, we
11 provided the equipment to obtain the core debris, the
12 initial core debris samples. We analyzed those in Idaho.
13 It may be an opportunity to help set the record straight.
14 There was some question about the analysis of these samples
15 and the timeliness. I should point out that we took those
16 samples and our principal emphasis when we took them was to
17 provide GPU with information to assist them in the
18 defueling. We did that and we continually provided
19 information.

20 The last part of that information, the stuff
21 that the researchers are really interested in is what is
22 the metallography of those samples so you can determine
23 what the temperature is. That came at the end of; the
24 researchers would like to have done that at the beginning.
25 We tried to get them focused on that information.

1 We provided design, and developed and deployed
2 the acoustic monitoring system to help map out the void in
3 the reactor and we are in the process of final checkout of
4 a core boring device to take an axial stratification sample
5 of the TMI-2 core.

6 To speak to the other avenue of what we call
7 technology transfer, which is to take the information from
8 TMI and put it out to the industry, GPU is doing some
9 things that will have generic benefit to the rest of the
10 industry. DOE funds those efforts to the tune of between
11 \$115 million a year, depending upon the scope of work.
12 Principally our contributions have been initially in the
13 gross decontamination experiment that we funded. We funded
14 the initial quick look at the TMI-2 core. We provided
15 about half funding for the head removal effort. We
16 provided for funds for the plenum removal tools. And we
17 have just recently provided funds for the, all of the fuel,
18 the initial fuel removal tooling.

19 All of this activity results in not only the
20 tools but it results in a report for us, design reports
21 that are then sent to over 750 people on the standard
22 distribution list to have in their libraries, all the
23 utilities around the country to have in their libraries so
24 they can have this technology at their disposal. Plus we
25 have a system set up where we try to look at this data from

1 a generic standpoint and find out what is important and use
2 EPRI's mechanisms to get that information out to their
3 utility users.

4 Our focus in the next year is in the development
5 of the tools to remove the fuel in the lower plenum as well
6 as operations funds for selected operations during the
7 course of the overall fuel removal operation.

8 How do we carry that out? DOE headquarters and
9 DOE-ID, very similar to NRC on-site, have a pretty tight
10 relationship. This is the kind of job of policy and
11 implementation of sort of real time in a way.

12 We have established a pretty good communication.
13 We have an on-site contracting staff of about 25 people
14 right now. That is starting to go down.

15 They have the responsibility through a contract
16 with GPU to write scopes of work and to allocate funds for
17 work that is of generic benefit to the industry.

18 What is our focus for the next year? Well, as
19 Yogi Berra would say, it ain't over until it is over. I
20 guess from a DOE standpoint it is not over until the fuel
21 is shipped off the island and stored in Idaho.

22 Our attention right now is to see that we get to
23 that point of start of fuel shipping by March of 1986. And
24 to that end, DOE and EG&G are in the process right now and
25 we have briefed the panel on the acquisition of two rail

1 casks. Right now the schedule points to the completion of
2 fabrication and certification still by a December date for
3 the first cask and a January date for the second cask.

4 And I think I did that one in 15 minutes.

5 MR. MORRIS: Close.

6 MR. ROTH: You are a fine spokesman for DOE. Ed
7 McMahon, watch out.

8 You mentioned in number 25, how many DOE staff
9 are on-site?

10 MR. BIXBY: There are two assigned.

11 MR. ROTH: Including yourself?

12 MR. BIXBY: Yes. And there is one back in Idaho.
13 We have an organizational structure. We too are going
14 through somewhat of an organizational change.

15 Before there were sort of split responsibilities.
16 The site did its thing and the Idaho operations did its
17 thing.

18 What is happening is that both of those pieces
19 are coming together under myself, so that we will have
20 responsibility for both the on-island as well as the INEL
21 activities. Such things as you see here.

22 MR. ROTH: The other question would be on the
23 funding. Do you see a decrease or cutback as NRC has seen,
24 as far as you are aware?

25 MR. BIXBY: I see next year somewhere in the

1 \$12- and \$15 million category. I really can't speak to the
2 out years. But if you take a look at GPU's activities and
3 match that up against what our mission is, our prime focus
4 has been since we have arrived here is to get to the core
5 as soon as possible and get it out and get it off-site.

6 The majority of the effort that GPU is going
7 through to remove that fuel takes place over the next year.
8 Partly into '87. So our funding is going to be tied to
9 selected activity. We may see a big share in '86 and a
10 very small share in 1987. But I think '86 is sort of the --
11 I would look on it as the hump year. I think the important
12 part of getting the fuel out will probably take place in
13 1986.

14 MR. ROTH: Thank you.

15 MR. COCHRAN: Where are you going to store the --

16 MR. BIXBY: In the test area north of the pool.
17 We will take up half of the pool. That test area north.
18 We have -- GPU has designed the cannisters to, for a 30-year
19 storage life time. That is what our current design base is
20 right now, to store it out there for 30 years.

21 MR. COCHRAN: Tell me about that pool. What was
22 it built for? What else --

23 MR. BIXBY: There is nothing else in it right
24 now. The pool is about 30 years old. We have had to
25 design a series of racks to be able to store that pool,

1 store that fuel out there. There isn't anything --

2 MR. COCHRAN: They didn't build the pool in
3 contemplating a Three Mile Island accident.

4 MR. BIXBY: What they were going to use the test
5 area north for was the Aircraft Nuclear Propulsion Program.
6 That program died. In the last several years, the last
7 eight to 10 years, the industry has gone down and in a way,
8 TMI has sort of rejuvenated that test area north area and
9 has gotten the facilities upgraded in a way. And in
10 addition, there are going to be other programs coming in
11 there as part of the Civilian Radioactive Waste Management
12 Program.

13 MR. COCHRAN: What happened to the fuel that was
14 there?

15 MR. BIXBY: There wasn't any fuel there.

16 MR. SMITHGALL: I feel compelled to ask this. I
17 will take the generic problems and leave the specifics.

18 How do you respond to your critics who might say
19 that you will be a promoter of the nuclear power industry
20 as opposed to just a researcher? \$15 million a year, 750
21 people that you --

22 MR. MORRIS: Can you answer that in a minute or
23 so that -- we want to stay at least close.

24 MR. SMITHGALL: A promoter versus a regulator or
25 a promoter versus a researcher.

1 MR. BIXBY: I think you have got to look at the
2 end use, be it researcher or demonstrator. I think we are
3 getting information and that is going to be of benefit to
4 the rest of the industry and I think we would be remiss in
5 not making that information available. In the unlikely
6 event this thing, this situation like this happens again.

7 MR. COCHRAN: DOE was established as a promoter.
8 What is the purpose of your question?

9 MR. MORRIS: Willis, thank you very much.
10 Appreciate it.

11 What I would like to do -- this was suggested by
12 Joel Roth, I hope everybody would agree -- that is if we
13 could go right on to item 5, Bill Kirk is willing to do
14 that. Before Bill begins, those from the public that are
15 here, I would be interested in seeing just how many people
16 are present that are from the Maryland area that have not
17 been to a panel meeting before but are strictly people with
18 the public and not with the state organization or not
19 related to the government. Can I just see hands?

20 (Show of hands.)

21 MR. MORRIS: I think we see about six people
22 here.

23 None of you have been to any of our meetings
24 before, I assume?

25 Okay. Thank you. Just interested to see how

1 many people showed up for this particular meeting from the
2 public.

3 Bill, are you ready to go?

4 MR. KIRK: I am trying to figure out this
5 machine. We will figure this out yet. You get some -- I
6 think Tom Maznick or Mike Maznick was --

7 MR. SMITHGALL: How soon we forget. He missed
8 one meeting.

9 MR. KIRK: I have reason for this. He called me
10 up and said I had 20 minutes to summarize something that
11 the last time was presented to this committee took an hour.
12 Then he put me on the agenda for 10 minutes. I am going to
13 get him for this.

14 MR. SMITHGALL: There is five minutes.

15 MR. KIRK: I will turn up the speed. I find
16 myself compelled to make, instead of a scriptive
17 presentation, a summarized thing on a bunch of slides.
18 There are copies of them on the table there if anybody
19 would like to be able to read the numbers. I know you are
20 not going to be able to read them from the slides.

21 Everybody starts out with a picture of the
22 island. I started out this time with a picture of the back
23 side of the island. This is not the usual one that you see
24 in the newspaper. This is a picture from the river side,
25 and if you look down at the far lower right-hand corner,

1 that is where the water goes off the island after it has
2 been monitored and this is the thing that is of prime
3 interest down in this area. So I thought I would show the
4 point where it starts.

5 There is a complete description of the
6 monitoring program in a joint monitoring plan. I have left
7 copies of it on the back table. It is a joint monitoring
8 plan conducted by the Environmental Protection Agency, the
9 NRC and the Pennsylvania Department of Environmental
10 Resources, the Department of Energy, the several agencies
11 in the Maryland -- I don't know whether it is the health
12 department or the environmental group. At any rate, there
13 are five or six agencies joined together to conduct
14 environmental monitoring around Three Mile Island. They
15 asked me to summarize EPA. I decided why should I just
16 stop there so I put all of them on the same slide.

17 We are monitoring for a combination of things.
18 The first and the one that is usually seen by the public is
19 ambient gamma radiation. This is a measure of the levels
20 of penetrating proton type radiation present at various
21 locations around the island.

22 We do this in two different manners. One is a
23 continuous monitoring method using pressurized ion chambers
24 with telemetered data coming back to computerized central
25 processors in the office. There are two setups like this,

1 one by the Environmental Protection Agency, one by GPU. So
2 we have a total of 29 locations where continuous gamma
3 monitoring is done and continuous readout is available.
4 There are some telemetered exchanges of data going back and
5 forth between GPU, EPA, NRC, the state -- several
6 transmissions on this.

7 The next method, which is designed to get a
8 cumulative level, a cumulative dose of gamma radiation at
9 the levels being monitored is thermoluminescent dosimeters,
10 which is little crystals that essentially absorb energy and
11 save it until you heat it up and then you get light out
12 proportional to the radiation that the dosimeters have
13 absorbed.

14 We have a total of 200 different locations being
15 monitored between the four programs with about 8500
16 readings per year -- 8512 per year.

17 Tom Gerusky likes to say that there are so many
18 TLDS around Three Mile Island that a gamma proton can't get
19 out unintercepted.

20 The next thing we monitor is the air for
21 radioactive particulates, radioiodine, Krypton-85 and for
22 tritium.

23 For airborne radioactive particulates there are
24 a total of 25 stations; 1560 readings are samples analyzed
25 per year. These are broken up with eight being with GPU,

1 16 with EPA, Pennsylvania Department of Environment
2 Resources has three stations and the NRC has one.

3 The readings on these are primarily done by high
4 resolution gamma spectroscopy to identify isotopes of
5 interest that might be of reactor origin. Radioiodine
6 is sampled by drawing air through activated charcoal
7 cartridges. And we look at the cartridges on high
8 resolution gamma spectrometer to see whether there is any
9 iodine present.

10 EPA is doing 14 locations with weekly samples.
11 GPU has eight locations. Pennsylvania has three with a
12 total of 32 locations and 1300 analyses per year.

13 Because of the release of krypton during the
14 purging in 1980 and the possibility of pockets of krypton
15 in the core yet that may be released during the cleanup,
16 this would seem to be rather remote given the condition of
17 the core but we have continued to monitor for krypton at
18 four locations around the island. We have four locations,
19 GPU has four, for a total of eight places krypton is
20 monitored, 312 readings per year.

21 Tritium in air is a sort of unusual thing to be
22 monitored around the reactor. It is not standard at all.
23 What we do is collect the atmospheric moisture by drawing
24 air through a molecular absorbent and then distill the
25 water off the absorbent later in the laboratory and analyze

1 the water for tritium. We have five locations that we do
2 this in, the four in the immediate vicinity and one located
3 about 40 miles away as a comparison. We are the only
4 agency doing this at the present time.

5 The next thing we are looking at is water, which
6 is of primary interest down here. There are four different
7 varieties of sampling being done on the water coming into
8 and leaving the plant. On surface water downstream from
9 the plant, the number of wells around the island, and
10 precipitation, which is sort of just to see what is coming
11 in from above.

12 The monitoring I think is of most interest to
13 most people is the monitors that we have on the island, on
14 the water coming into the plant and the water leaving the
15 plant. We take a continuous sample on both. GPU takes a
16 continuous sample on both. The only difference is we
17 analyze ours daily and they are composited over a two-week
18 period. This leads sometimes to some differences in
19 answers.

20 There have been very, very few samples in the
21 last five years that had detectable levels of activity.
22 Most of this time it has been radioiodine which has later
23 been traced back to patients in Harrisburg getting iodine
24 for medical conditions.

25 Surface water, we are collecting water on the

1 runoff on the island. There is a surface runoff catch
2 basin where all the water that falls in precipitation on
3 the island runs off. We sample that one. GPU has got a
4 number of sampling stations on the river that they are
5 sampling.

6 We are picking up a sample with the cooperation
7 of the City of Lancaster at Lancaster and we have, that
8 adds up to a total of 13 locations and 700-and-some samples
9 a years.

10 Wells, we have five wells around the island,
11 mostly downstream of the middle center line of the island.
12 We started monitoring these in 1981 because of some high
13 levels of tritium in ground water on the island which
14 occurred due to a freezeup in a line on the borated water
15 tank.

16 At any rate we are still doing these monitorings.
17 We have not seen any activity in them. So we have reduced
18 our monitoring from a monthly to a quarterly basis, but we
19 will continue to do this.

20 Precipitation, GPU is doing five locations, we
21 are doing one, a total of six locations for 72 readings.

22 And miscellaneous -- excuse me, aquatic, this is
23 all being done by either GPU or by the state. In most
24 cases what is being done is GPU is collecting the sample,
25 the state is splitting the sample with GPU and they are

1 being analyzed in parallel to see if they come out with the
2 same answers. Their sediment samples are done on a
3 semiannual basis, vegetation on a semiannual basis and fish
4 samples taken in the river in the immediate vicinity.

5 Miscellaneous, there are a number of milk
6 samples, vegetation samples, fruit and soil samples being
7 done by the utility primarily with cooperation and
8 crosscheck samples with the Pennsylvania Department of
9 Environmental Resources.

10 In addition to the program that is conducted at
11 Three Mile Island, by the program director specifically at
12 Three Mile Island, EPA has another program known as the
13 environmental radiation ambient monitoring system which
14 collects water samples. They are collecting surface water
15 at Danville, Columbia, Conowingo and Leslie along the
16 Susquehanna and Chesapeake. They are also analyzing
17 drinking water at Baltimore, Conowingo, Columbia and
18 Harrisburg. That is a rather complete -- these samples are
19 generally collected quarterly. They are not a continuous
20 sample but they do serve as a reading of what is present.

21 MR. MORRIS: About how much longer do you have?

22 MR. KIRK: I am just going to show a couple
23 pictures and quit.

24 For the benefit of the --

25 MR. MORRIS: We have a lot of agenda items and I

1 just want to try to stay close to the schedule.

2 That is all right. Go ahead.

3 MR. KIRK: When I prepare something with 20
4 minutes, I have a hard time cutting it off. This is a
5 picture of the water monitor at Three Mile Island. Inside
6 this -- can anybody see this with the lights the way they
7 are? Who has got the controls?

8 This is the monitoring as it leaves Three Mile
9 Island, as far as EPA is concerned. We have in here a
10 continuous glow gamma monitor which gives us a reading on
11 gamma radiation on a continuous basis. Data is telemetered
12 back to my office in Middletown. It is also hooked up to a
13 dialer that we have nicknamed "Mortimer." If the levels go
14 any place above the set points which is about one-tenth of
15 the level permitted in drinking water for cesium, it rings
16 up one of four people and says things like, "the present
17 reading is" -- it tells us to do something about it. This
18 only happens in electrical storms so far.

19 We also have the continuous monitor in this
20 building.

21 This is a closeup of the reporting and
22 monitoring instrumentation. This is the runoff pond.
23 Typical air monitoring station and my 10 minutes is five
24 minutes gone. I will shut up and -- I will answer any
25 questions anybody may have generated.

1 MR. MORRIS: Any questions anybody would like to --

2 MR. DI NUNNO: I think you ought to make some
3 comment. These are all the stations out there. But are
4 you really seeing anything of any significance? I know the
5 answer to that but I think you ought to tell the people out
6 there something about these results that you are either
7 seeing or not seeing.

8 MR. KIRK: The only positive results that we
9 have gotten in the last five years have pertained to
10 tritium in air at the TMI observation center which is about
11 a half a mile from the island. We have seen detectable
12 levels of tritium in at atmospheric moisture. These levels
13 have been about a factor of 10,000 below the appropriate
14 limit for tritium in air. So they have been detectable but
15 not of any significance. We have seen activity in water,
16 mostly tritium at levels slightly above the detection
17 limits that we would have with the equipment.

18 There hasn't been any -- I think on one occasion
19 we managed to see some barely detectable levels of cesium
20 come out of unit 1 when they were cleaning a tank. This
21 would be about the sum total of what we have seen.

22 We do see iodine in the river periodically. In
23 fact it is probably a given that as long as you have a
24 bunch of hospitals operating along the river, if you sample
25 at a sensitive enough level you will see some radioiodine.

1 MR. MORRIS: Thank you. We will take a 10-minute
2 break and reconvene. It is my understanding from Tom
3 Gerusky that he gives up his time. So under those
4 circumstances, we will go right through item 7 after the
5 break.

6 (Recess.)

7 MR. MORRIS: I thought it would be important to
8 announce that the game with Pete Rose did not yet start.
9 So hang in.

10 First item of business now is item 7 on our
11 agenda. The Maryland Power Plant Siting Program. I am
12 going to ask each person from here on in to please try to
13 stay within the time allotment. This one is scheduled for
14 10 minutes. The next one is 20 minutes although Frank said
15 it might take up to 30. I am going to ask that you try to
16 keep it within 20 minutes. And then the final presentation
17 would be NRC, 10 minutes because I do not want to see this
18 cut the public comments short. I think it is important to
19 provide adequate time for the public. So let's, if we can,
20 try to stay on schedule.

21 I guess, Frank, that means you are going to have
22 to give some thought to watching the presentation. Thank

23

24 MR. MAGETTE: My name is Thomas Magette. I am
25 the administrator of site evaluation for the Maryland Power

1 Plant Siting Program. The Power Plant Siting Program is
2 part of the Department of Natural Resources. Our role is
3 one of monitoring all operating power plants in and around
4 Maryland for any environmental impact in Maryland and
5 evaluating proposed sites for power plants. Because we
6 have basically extended our role to look at power plants
7 that are not in Maryland but may have some effect on
8 Maryland, we of course have a concern with Three Mile
9 Island. We also have a concern with Peachbottom because it
10 is on the Susquehanna River just north of the Maryland
11 Pennsylvania border. Our radiological monitoring program
12 is therefore established to look at not only Calvert Cliffs
13 which operates in Maryland, but those two in addition.

14 In 1980 we have just begun extending our
15 monitoring program to fully look at the effects of the
16 Peachbottom atomic power station and as part of this effort
17 we also extended our monitoring program all the way up
18 river to the island, to Three Mile Island. And in a period
19 of approximately two years after the accident, we have
20 actually collected environmental samples from the vicinity
21 of Three Mile Island. We have since discontinued that
22 because we never found anything in any of the samples. We
23 feel that our control stations for Peachbottom, which is
24 north of the influence of that plant in the Susquehanna
25 River, are adequate to show any downstream influence from

1 Three Mile Island at least to the extent that it would be a
2 concern in Maryland. So we feel that the monitoring
3 program we have in place is adequate for looking at any
4 effects from Three Mile Island and the environment and fish
5 and submerged vegetation and shellfish in the Susquehanna
6 River and the Chesapeake Bay.

7 As part of this program, we also do cooperative
8 programs with the utilities both in Maryland and also as
9 far north as GPU. We have at least one program presently
10 going where we swap samples. We have the program where
11 mussels and crayfish are caged in Conowingo pond, Holtwood
12 pond, which is north of Peachbottom and then up in the
13 Susquehanna River next to the plant site, and we both
14 collect samples from each other's stations and do our own
15 independent analyses.

16 So we do cooperate very closely with the utility.
17 We also cooperate quite closely with the Nuclear Regulatory
18 Commission. We have been involved with Bernie Snyder's
19 office since the time before it was Bernie Snyder's office
20 and after that time.

21 MR. MORRIS: Good-bye, Bernie.

22 (Laughter.)

23 MR. MAGETTE: We have provided extensive
24 comments on the environmental impact statements for the
25 cleanup and we have also worked with them on draft

1 documents that they have produced.

2 One of the major activities in Maryland
3 concerning the cleanup of Three Mile Island is the
4 existence of the Governors Advisory Committee on the
5 cleanup. This is a panel that is similar in its objective
6 and its mandate to your own and it reports to the governor
7 and is expected to basically provide him with an
8 independent look at all aspects of the cleanup and an
9 independent confirmation of what he receives from his own
10 staff and our office.

11 There is one representative of the committee
12 here tonight, Mr. Mitch Kaplan who is on the committee, who
13 along with Dr. Henry Wagner, a former member of your own
14 panel, would be more than happy to receive any comments or
15 questions that you might have relative to their function.

16 They are still active and we along with the
17 committee have taken several trips to the island. They
18 have had upwards of 20 meetings over the past two years and
19 essentially now we have annual visits to the island where
20 GPU gives us an update of the cleanup and we meet with the
21 NRC staff and are briefed as to the status of cleanup.

22 The last thing I would like to mention is if
23 there are members of the public that are here tonight that
24 would have any comments or questions about our role, we
25 would be more than happy to help them and also, as

1 Mr. DiNunno is very interested in getting some members of
2 the public from the Maryland area out and finding out what
3 you are going on and also showing them that there is an
4 interest in the Maryland state government as to what is
5 going on, and we are maybe a little disappointed that we
6 have a small turnout but if people feel that there may be
7 avenues for contacting them about activities related to the
8 cleanup, then I just ask them if they would give me their
9 name and address and could you make sure they are contacted
10 in the future so that they may provide a better conduit for
11 information flow to citizens in this part of the world.

12 I would be happy to answer any questions that
13 anyone on the panel has.

14 MR. MORRIS: Where is Henry Wagner tonight?

15 MR. MAGETTE: Henry Wagner has a prior
16 obligation, as I understand it.

17 VOICE: Dr. Wagner is in Michigan. He had --

18 MR. MORRIS: Tell him we look forward to seeing
19 him and we are sorry he did not make it.

20 VOICE: I brought with me a list here of the
21 meetings, places and also the membership of the Maryland
22 Governors Committee.

23 MR. MAGETTE: I have copies to provide for your
24 transcript, if you like.

25 MR. MORRIS: If you could provide a copy of that

1 and it can be attached to the transcript as part of the
2 record.

3 MR. MAGETTE: Thank you very much.

4 MR. MORRIS: Thank you very much. Appreciate
5 your coming.

6 MR. DI NUNNO: I think, Mr. Chairman, that Tom --
7 again, the same question that I asked the EPA
8 representative here, I think some comments need to be made
9 as to whether you found anything in your monitoring
10 activity. So much attention is given that there are lots
11 of monitoring out there. But what people want to know is,
12 are you finding anything?

13 MR. MAGETTE: We have analyzed samples, edible
14 fish and bait fish species, shellfish, crayfish, submerged
15 vegetation, water, and sediments in the Susquehanna River
16 and we have found no radioactivity that we could attribute
17 to the operation of Three Mile Island. We have found
18 radioactivity that we could attribute to Peachbottom in the
19 area of that plant, but never in any consumable seafood
20 species, only in the bait species or in sediments. We also
21 have collected our own independent samples of the processed
22 water from the site and confirmed that GPU concentrations
23 as they record. We have discontinued that when the water,
24 when the decontamination was completed, the large
25 quantities of water.

1 We have found no --

2 MR. DI NUNNO: Thank you.

3 MR. MORRIS: Those comments obviously cause
4 other questions.

5 MR. COCHRAN: I had a question before the
6 comments.

7 MR. MORRIS: I missed you.

8 MR. COCHRAN: What would trigger your concern
9 with respect to radioactivity in the Susquehanna from Three
10 Mile Island? Do you have different criteria than, say, the
11 federal standards that you -- at some lower level that you
12 get concerned and the federal government does, or what are
13 you standards?

14 MR. MAGETTE: We are not a regulatory agency so
15 we don't have standards as such. We do samples, or do
16 analysis of samples, to detect levels as low as background
17 and our concern, certainly in the case of finding something
18 from Three Mile Island as far south as Hopewood, would be
19 triggered by finding anything at all. Our general baseline
20 monitoring program is conducted to serve the objective of
21 finding how radionuclides are transported throughout the
22 environment, if there is any sort of accumulation over time
23 as a function of power plant operation, if there is any
24 sort of addition of the food chain that causes an
25 increasing potential dose to consumers of bay seafood. So

1 it is really more of a baseline monitoring program. Our
2 concern is triggered by finding anything. We are trying to
3 understand where it goes and what it means when we do find
4 anything. But we are not looking at a regulatory standard.

5 MR. COCHRAN: You find activity from Peachbottom.
6 It is evidently at a level that you don't get concerned
7 enough to ask that it be reduced, the emissions be reduced;
8 is that right?

9 MR. MAGETTE: That is correct. We find activity
10 from Peachbottom and we consider it to be, as I am sure the
11 utility does also, well within their tech spec limits and
12 we don't find it in any edible species, and so even our
13 projections from other species as far as a human dose are
14 several orders of magnitude below any levels of regulatory
15 limits.

16 MR. COCHRAN: I trust that since you know the
17 concentrations in the cleanup water, I trust that if one
18 bled the cleanup water after it has been cleaned up, as it
19 has been, into the Susquehanna say over a year, you would
20 not be concerned about the activity levels in the water?

21 MR. MAGETTE: That is correct. We feel that the
22 activity levels present in the processed water would not be
23 possible to be detected above existing background
24 concentrations.

25 MR. COCHRAN: You would have no problem in

1 bleeding cleanup water into the Susquehanna?

2 MR. MAGETTE: I can't say that. That is a
3 policy question that is a little bit beyond whether or not
4 this radioactivity that we can find --

5 MR. COCHRAN: Let me just ask you personally,
6 without getting into your -- without getting into your
7 policy, what do you personally believe.

8 MR. MAGETTE: I personally would have no problem
9 if they bled the water into the Susquehanna River, from a
10 health and safety point of view.

11 MR. COCHRAN: And you seem to indicate that
12 there is some sort of potential problem there with other
13 members of the panel.

14 MR. MORRIS: Let me cut in here.

15 MR. COCHRAN: Don't cut in here.

16 MR. MORRIS: As the chairman I will cut in here.
17 I will cut in at what point I think is appropriate. We
18 have on our agenda items 8 and 9, accident stored water.
19 Do you plan on being around at that particular time? If
20 there are questions that come up at the time on this issue,
21 I would be happy to have you come back, but I see no
22 purpose in continuing.

23 MR. COCHRAN: He hasn't answered the question.
24 You cut in before he answered the question.

25 MR. MAGETTE: I remember the question.

1 MR. COCHRAN: You can answer it later.

2 MR. MORRIS: Fine. Stick around, please. Thank
3 you.

4 Now, if we could go into that subject matter
5 which is item 8, processed water from the Three Mile Island
6 2 accident stored at the Three Mile Island 2 site, with GPU
7 making a presentation.

8 MR. DEVINE: I will try to be brief.

9 MR. MORRIS: You don't have to be brief. Just
10 20 minutes.

11 MR. DEVINE: I will take my time.

12 (Laughter.)

13 My name is Jack Devine. I am a technical
14 planning director at Three Mile Island 2. The subject is
15 an outline of our current situation with respect to
16 processed water. I would like to point out at the outset
17 that there is nothing particularly noteworthy about this
18 juncture of the project with respect to processed water.
19 Simply the fact that you have asked for an update and that
20 we are in Maryland and certainly people in Maryland have an
21 interest in the subject.

22 In fact, I had to try out some files to
23 refamiliarize myself with the subject because we are not
24 actively pursuing the subject of disposition of the
25 processed water right now.

1 I will try to brief you in a very quick fashion
2 on the background, for the benefit of those who have not
3 been involved in prior discussions on this; summarize where
4 we are and outline our plans which really involve simply a
5 timetable for making a decision rather than any projected
6 decision.

7 A few items which I thought would be valuable to
8 discuss just for a moment as an opener are listed on this
9 slide. First of all, we all are concerned with processed
10 water. But in fact the real focus of our attention is on
11 the contamination in the processed water that often is a
12 source of some confusion because in large measure they are
13 separable, have been separated and then continue to become
14 intermixed over the course of time. They are separate
15 issues. I will try to describe where the processed water
16 is but where the fission product activity is.

17 Certainly from a standpoint of water, our prime
18 interest early in the project was control of water because
19 we are a power plant on an island in a river and leakage of
20 contamination in liquid form is certainly of primary
21 concern. But having removed the bulk of the radioactivity
22 from that water, our concern diminishes accordingly.

23 Secondly, the distinctions between tritium and
24 dissolved/suspended radioactive contamination. I don't
25 want to get into a technical treatise but you will note

1 that the tritium is always listed separately. That is
2 because tritium behaves quite differently than the other
3 contaminants. The other contaminants that we deal with are
4 in fact that: They are contaminants in water that can be
5 removed physically from the water by physical or chemical
6 processes. Tritium is basically a water which includes as
7 part of the hydrogen molecules, hydrogen/oxygen molecules,
8 a variant form of hydrogen. It is chemically
9 indistinguishable from water. That doesn't necessarily
10 make it worse than other contaminants because biologically
11 it is less toxic. But it is different and it is addressed
12 differently.

13 I have taken liberal use of approximate numbers
14 in this presentation. I really want to highlight that
15 ahead of time. We have tons of data; statistics on
16 radioactive contaminants vary with time. The radioactive
17 materials decay continually. There is mixing from one body
18 of water to another. We monitor 29 different locations
19 on-site. There are differences in accounting statistics.
20 There are differences in operational treatments, et cetera.
21 It is always difficult to try to get a complete snapshot in
22 time and express exactly how much exists at any one place
23 and compare that with perhaps a previous measurement.

24 For that reason I have approximate numbers. Any
25 time one does that, risk that the scientific critics will

1 find small differences, let me assure you that if you want
2 any specific precise exact numbers, we can provide them.

3 I have done my best to provide information that
4 gives you an honest overview and beyond that we can explore
5 specifics.

6 Just for simplicity, also, I have listed only
7 cesium and strontium and tritium and fission products or
8 contaminants of interest. Those are by and large the most
9 significant ones. Our evaluations and our data include the
10 full spectrum. I didn't want to complicate the
11 presentation with discussion of contaminants that were
12 hundreds or thousands of times less concentrated than those.

13 Briefly going through the background, we started
14 out with about a million gallons plus. I guess it was 1.1
15 million gallons of highly contaminated water. It became
16 contaminated by being in contact with fuel during the
17 course of the accident. So the fission products contained
18 in fuel in an operating reactor in our case got into the
19 water which surround the reactor. As that water then
20 leaked into the reactor building, we distributed fission
21 products through a million gallons of water. We weren't
22 able to deal with that water very well at all initially.
23 We didn't have any way to handle it. The early years in
24 the project were involved in building facilities to do that.

25 The net consequence is that in large measure

1 that million gallons of water was largely processed. The
2 solid products which contained most of the curies from it
3 were initially stored on-site and shipped from the site. I
4 have got a table which will summarize that.

5 On your handout you have seen these numbers
6 before. You can examine at your leisure. On for brevity.

7 Let me point out a few items. First of all it
8 really is important to note just how effective the
9 processing was in removing fission products from this water.
10 In the reactor building basement water, about 600,000
11 gallons, 310,000 curies to begin with, virtually all of
12 that was removed and the measured residue in the 600,000
13 gallon gallons of processed water was about one-thousandth
14 of one curie. The right-hand side is a summary of the
15 initial processed water that we collected and began to
16 manage on the site after the first few years of collection
17 and processing of the very highly contaminated water
18 on-site.

19 You will note that in the case of processing of
20 reactor coolant system water, I haven't listed processed
21 water. That is because of the way we dealt with that water.
22 It was a feed-and-bleed process, which means that we were
23 on a batch basis taking some water out of the reactor,
24 cleaning it, replacing it with more clean water and then
25 recycling water. So in fact the processed water ends up

1 where it started. We wouldn't consider it processed water
2 because it is then in contact with the damaged fuel and is
3 exposed to new fission product activity. So it is
4 continually becoming contaminated.

5 MR. COCHRAN: Were those concentrations before
6 you started then?

7 MR. DEVINE: These are total curie content. The
8 middle column is basically the total fission product
9 content in these respective bodies of water before we
10 started. In the case of the reactor coolant system water,
11 it was basically an equilibrium concentration, in our
12 samples of reactor coolant before we started processing.

13 You will notice the note at the bottom which I
14 presented the data at the time of processing which was a
15 couple years after the start. Early fission product
16 contaminations for many other isotopes are much, much
17 higher.

18 MR. COCHRAN: I am just curious, in the reactor
19 coolant system, is the water getting any cleaner?

20 MR. DEVINE: Yes.

21 MR. COCHRAN: What would be the numbers? For
22 example, for the 800 curies of cesium.

23 MR. DEVINE: The quantity of water has changed
24 as well as the fission product activity. The cesium
25 activity is about a hundreth of what it was at that point.

1 There is only about half as much water. Cesium is way down.
2 Strontium has continued to reintroduce itself to the water.
3 The reductions there are more like a factor of 5 or so.

4 MR. COCHRAN: When you get in there with tools,
5 these numbers don't go back up again.

6 MR. DEVINE: They haven't been affected by
7 physical manipulation so far. We haven't found a great
8 deal of correlation nor would the experimental data suggest
9 there should be. But certainly there will be some
10 continued reintroduction of the fission product activity in
11 the fuel. Strontium is kind of important because we have
12 only removed about 6 percent of the total strontium. So 94
13 percent is available for continued introduction into the
14 water. That is in the reactor.

15 Moving on, very briefly, with respect to
16 background, a lawyer could spend several hours describing
17 all of the iterations that involved our discussion with you
18 and others about discharging, but in a nutshell all of
19 those are currently embodied in an NRC tech spec which
20 forbids us to discharge processed water without their
21 expressed approval. They have a procedure for doing that.
22 That is a currently operative limitation on our operation.

23 Our policy, I would call your attention to it,
24 with respect to processed water really is very clear. That
25 we are retaining ~~processed~~ processed water on-site and we are not

1 actively pursuing -- we are reusing it to the largest
2 extent possible and we are not presently pursuing any
3 disposition options. That is really a sensible exercising
4 of priorities. That water doesn't represent a hazard to us
5 on-site. It is quite useful to us. We have many uses for
6 cleaned up water in the recovery process. And we simply
7 have no incentive to dispose of it now. We will at the end
8 of the project and our attention will be focused on it at
9 that time.

10 MR. WALD: Is that agreement with the City of
11 Lancaster indefinite in time?

12 MR. DEVINE: It is no longer valid. It had a
13 specific time frame. I believe it terminated according to
14 the original agreement in December 1981. Mayor Morris
15 probably recalls.

16 But in any event, it was replaced by an
17 identical agreement or a ruling, a directive from the
18 Nuclear Regulatory Commission. In fact the definition of
19 "processed water" in our tech specs was extracted verbatim
20 from the City of Lancaster agreement. So it is in effect
21 the same limitation.

22 Where are we now? As I described, the processed
23 water remains on-site. We are using it routinely for
24 shielding purposes, for decontamination purposes. When we
25 washed surfaces, we used water that is previously

1 decontaminated. When we replace water which has become
2 contaminated in the reactor, we inject previously processed
3 decontaminated water in that process. So we are reusing
4 the water. The next table will show you specifically what
5 the numbers look like today.

6 The quantity of processed water has gradually
7 increased, roughly from about 1.1 or 1.3 million to
8 currently almost 2 million. That is because of continual
9 sources of additional water. We try to minimize that but
10 it is unavoidable to a large degree. For example, the
11 condensation in the reactor building, that drips in the
12 basement, mixes with the contaminated water in the basement.
13 We then collect it and control it in the same fashion that
14 we controlled the original processed water.

15 So the overall quantity is increasing but it is
16 largely increasing in the form of pure water which is being
17 added to the contaminated water, so in general the fission
18 product has to be controlled. It is a question of volumes
19 rather than contamination.

20 We have not evaluated processed water disposal
21 options beyond those preliminary ones which we have
22 considered in 1979, as I mentioned a few minutes ago.

23 I will talk in a minute about what some of those
24 obvious choices might be.

25 This is an interesting slide. I just point out

1 a few things here and encourage you to take a look at it in
2 more detail at your leisure.

3 In putting this together basically I tried to
4 categorize those 29 sample points that we normally deal
5 with into common groups to describe where the accident
6 generated water is today. By today I mean basically as of
7 this month. As I mentioned, we are dealing with about 1.9
8 million, almost 2 million gallons of water. About 860,000
9 gallons of that is stored in tanks which we built
10 specifically for the purpose of storing processed water.

11 The water quality in those tanks is very
12 representative of what we would refer to as polished or
13 finished or decontaminated water. It is very, very low in
14 cesium and strontium activity. Those numbers are in curies.

15 It is still relatively high in tritium content
16 because the processing steps which we used to clean the
17 water have no effect on Tritium. So the only way to get
18 rid of tritium is basically by natural decay and to a
19 lesser extent by evaporation.

20 MR. COCHRAN: You lost half of the tritium. If
21 I look at your other page, you have got 2500 curies
22 identified.

23 MR. DEVINE: The tritium numbers. Basically we
24 had 2500 curies. About 35 percent of that is gone by decay.
25 I list about 1000 here. We have estimated about 700 by

1 evaporation. Most of that is a timing problem a little bit
2 in those numbers. Most of those are measured early on
3 while that water was still in the reactor building basement.
4 Particularly during the krypton venting in the early
5 activities with water in the basement, there is a mechanism
6 for removal of that water through evaporation. Also there
7 has been obviously some continuing evaporation from other
8 sources.

9 There is some statistical uncertainty in these
10 estimated figures, but I think they are probably pretty
11 close.

12 MR. COCHRAN: I am going to have a hard time
13 believing you could evaporate 700 curies of tritium and not
14 a proportional amount of light water.

15 MR. DEVINE: I accept that. It goes with the
16 water. To the degree the water is then mixed with new
17 water, then the bulk of the total quantity may look
18 different. I think the basic inconsistency is in the
19 timing. If most of that occurred before the water is
20 removed from the reactor building basement, it was removed
21 before we measured the amount of water that we started with.
22 The water quantity was measured as it was being withdrawn.

23 We only had a very crude measurement when it was
24 still in the building. I think that is the basic
25 discrepancy. If you look at it from that standpoint, the

1 numbers hang together very well.

2 Looking at some of the other quantities of water.
3 Spent fuel pool, just as an example of how we used this
4 water, the submerged mineralizer system. It is slightly
5 contaminated from the submerged mineralized system but it
6 is clean. Fuel transfer canal is the water which is
7 currently shielding the plenum which we removed in May.
8 The reason those numbers are higher in concentration is
9 simply that the plenum is contaminated and that has been a
10 source of recontamination of the water.

11 Reactor coolant system is continually in contact
12 with the core. Consequently there are some rather high
13 numbers of radioactivity in that water, although obviously
14 this would be reprocessed after it is removed, after
15 defueling. Finally that last category, which is difficult
16 to understand without looking at the many contributors,
17 includes such things as the water in the reactor buildings
18 basement which is still in contact with the sludge on the
19 floor, which is highly contaminated and is usually picking
20 up a lot of that fission product activity.

21 What are we going to do? First of all, as far
22 as our perspective on the problem, we are looking at about
23 2 to 2-1/2 million gallons of water to be processed before
24 the end of the recovery. Our projected growth rate would
25 shoot that at about 2.1 but periodically we see increases.

1 So conservatively we are planning to deal with about 2-1/2
2 million. Our end point objective is not to leave water on
3 the site. That has been identified as one of the
4 alternative plans but our position is that we are not sure
5 what we are going to do with it but we are not going to
6 leave it on the site because that is not an appropriate
7 place for long-term storage of water that is considered
8 necessary for control.

9 The anticipated timing, we will be examining
10 options next year and plan to propose to NRC our preferred
11 disposition by the end of next year. We would expect NRC
12 to have, to take about six months to review that, which
13 would leave the last year of the project to implement that
14 disposal option. That is a very approximate time frame,
15 but it is certainly consistent with our overall plans for
16 the program.

17 What our options are, I just interestingly
18 picked up the NUREG which Bernie Snyder mentioned which
19 happens to talk about this subject. They listed about a
20 dozen options. We initially studied about a dozen options.
21 I rather arbitrarily selected four specific ones as ones
22 which seemed to be particularly sensible, at least in
23 comparison to the others, but this isn't a complete list.

24 We could transport the water off-site and
25 discharge of it someplace else or let someone else dispose

1 of it. We could solidify the water and retain the solid
2 products on-site. The solid formula would represent no
3 hazard and would be very low in contamination level
4 compared to the other solid products on the site.

5 We could evaporate the water to the environment.
6 That would get rid of all of the tritium and would leave
7 liquid concentrates which would be solidified and disposed
8 of. We could remove the radioactivity from the water and
9 release it with dilution assuming it met acceptable
10 standards. Those are obvious options.

11 We are not proposing any at this point. To
12 evaluate them will take into account environmental and
13 public health and safety and regulatory requirements. I
14 will assure you that we are not going to propose anything
15 which we are not a hundred percent satisfied is fully
16 acceptable with respect to those two. The resources
17 involved have to be taken into account, including the
18 dollars and time it will take to affect the disposition.
19 Public concerns as well.

20 Obviously those same factors will be taken into
21 account by the NRC when we evaluate offers.

22 I arbitrarily listed some important conclusions.
23 99 water is on-site now. It is useful in the cleanup and
24 it is not hazardous in terms of effect on the cleanup or
25 the cleanup workers or the public.

1 The processed water will not remain on-site
2 after the cleanup. We will select a preferred option by
3 late next year and that disposal option will be in our
4 judgment safe and a reasonable, sensible one and obviously
5 one which is consistent with regulation.

6 Are there any questions?

7 MR. MORRIS: Jack, I have a quick one. When you
8 say legal, it is my understanding that as part of the
9 funding that was approved by Congress, Congress did place
10 the condition that the recommendation of Congressman Walker
11 from Lancaster, that the wording -- I am not clear on that,
12 but I think it had something to do with if any of the
13 federal money -- that no federal money could be used that
14 would ultimately result in a discharge of the water into
15 the Susquehanna River.

16 I don't know if you are familiar with that. If
17 not, I am going to ask the NRC what their interpretation of
18 it. Is there any question at this point that the water can
19 be discharged into the river under the, given the condition
20 of the Congress on the funding?

21 MR. DEVINE: My understanding is that that is
22 not applicable to any of our funding but it is applicable
23 to NRC.

24 MR. SNYDER: I can speak to that in the next
25 discussion.

1 MR. MORRIS: Fine. I will be happy to wait
2 until then. Thank you very much.

3 There is a question. He always likes to wait
4 until you get two steps away.

5 MR. COCHRAN: Can you compare these tritium
6 levels, on the annual release of tritium from Three Mile
7 Island 1, should it operate?

8 MR. DEVINE: I have that data with me. My
9 understanding, as a matter of fact it was part of the
10 presentation that I forgot. I just today pulled out an
11 NRC document that tabulates all of those. I could look it
12 up tonight. Scanning the data, it appears that about 1000
13 curies per year is a good average number for tritium
14 release from an operating power plant. We are talking
15 about something like that total over a long period of time.
16 There is a wide spectrum there.

17 MR. MORRIS: Jack, to continue that question,
18 where is the thousand released to?

19 MR. DEVINE: Basically liquid streams. Just --
20 let me follow up just for a minute. In qualitative terms,
21 comparing this water with normal discharged water from a
22 plant, not to propose discharge but for comparative
23 purposes, tritium is roughly the same in terms of an annual
24 discharge. Fission products, particularly strontium are
25 higher because our fuel failed and most plants with good

1 fuel don't have failed fuel. Maybe 10 times as high as
2 that. Activation products, which are a result of the
3 operating history of the plant, are much lower because our
4 plant has a poor operating history. So it is a different
5 mix. It is that same mix which drove us to the variance on
6 EPICOR liners.

7 MR. MORRIS: Thank you.

8 Bernie, are you making this presentation?

9 MR. SNYDER: Let me answer your first question,
10 Art, so we won't forget about it. The question had to do
11 with restrictions on the use of funds to facilitate the
12 discharge of the water that is processed to the river.

13 There was an amendment that was attached to
14 either an authorization or appropriations bill of the NRC a
15 couple of years ago. That placed a restriction on the fund
16 that we got from the Congress to run our agency. It said
17 none of that money could be used to facilitate the
18 discharge of this body of water. It was further clarified
19 at some point to allow us to expend our resources, manpower,
20 consultants if necessary, to review a proposal that the
21 company might make, but the interpretation at the time that
22 I got it was that we actually couldn't go forward and
23 approve the discharge of the water because in order to
24 carry out that activity, we would have to expend some
25 monies, some monies which have been appropriated under this

1 particular act.

2 The amendment which was called the Walker
3 Amendment -- Congressman Walker from your area, Art, had
4 introduced -- only applied, as I recall, only applied to
5 that one year's appropriations. That doesn't mean that it
6 couldn't be reintroduced. But it is no longer operative.
7 We have passed that year -- I can't remember whether it was
8 fiscal year '83 or '84. But it is long passed at this
9 point.

10 Does that answer your question?

11 MR. MORRIS: Yes. Thank you.

12 MR. SNYDER: Let me very quickly indicate what
13 our role will be on this question of processed accident
14 water disposition. As Jack correctly pointed out, there is
15 an absolute restriction in their license that prohibits the
16 discharge of the water and any move in that direction would
17 obviously require a modification of their license. That
18 would be the mechanism by which any disposition by -- the
19 mechanism that most plants use would require that. But
20 there are a lot of things that would have to take place
21 before that. So that would be the end point.

22 Let me back up a little bit.

23 We would require of GPU a comprehensive analysis
24 on their part and a well-justified proposal when they
25 choose to make it. In fact, you have heard just a few

1 minutes ago what their anticipated schedule might be on
2 that. But it is going to take an initiative on their part
3 before we are going to do anything of any significant
4 review of the question. Upon receipt of a proposal from
5 them which will be publicly available, the -- we will have
6 to satisfy a number of requirements, the principal of which
7 will be the requirements that are stated in the National
8 Environmental Policy Act, NEPA. We will have to do an
9 environmental review, the extent of which is to be
10 determined.

11 In carrying out that review, we will, as we
12 always have, solicited input from the public and we will
13 certainly take input from the public into serious
14 consideration in this matter.

15 There has been some reference made to some other
16 legal restrictions. My understanding of the situation on
17 the so-called City of Lancaster agreement, which was
18 reached shortly after the accident, is that the City of
19 Lancaster agreement was basically satisfied with one
20 exception, with the issuance of the Programmatic
21 Environmental Impact Statement in 1981. There was also a
22 time limit in that. But both of those have been satisfied.

23 In Dr. Travers' weekly report that you all get
24 and many of the public get, there is reference still made
25 to the water samples being taken and the numerical limits

1 that define processed accident water which is clearly laid
2 out in the City of Lancaster agreement. So that part of it
3 forms the operative definition for processed accident water.
4 I won't go into the details of that, but that is available.

5 The one remaining agreement that the NRC has
6 with the City of Lancaster under this particular agreement
7 is one that specifically gives the City the opportunity to
8 appear before the Commission on this issue, which even if
9 it weren't in agreement I am sure would be available in any
10 case. But the fact is it is clearly laid out.

11 Art, you are familiar with that probably as much
12 as I am. That is my understanding of where we stand on
13 that agreement at this point. Is that -- I have to ask you
14 the question at this point. Does that square with your
15 understanding?

16 MR. MORRIS: As far as I know, it does. I do
17 believe that outside of the agreement, GPU has made public
18 comments that -- and obviously they can't discharge anyway
19 because NRC has regulations, but that they would not do
20 anything in conflict with that agreement until they go
21 through the process that they have to with the NRC. So I
22 think you stated it accurately.

23 MR. SMITHGALL: Somehow I remember that any
24 communications between the licensee and the NRC about
25 disposition of water was to be sent to the City and other

1 plaintiffs involved. I am ahead of myself on that?

2 MR. SNYDER: I was going to come to that. That
3 is the stipulation that was agreed upon between the NRC and
4 the Susquehanna Valley Alliance and SVA. We did have a
5 case that was brought, some time after the City of
6 Lancaster agreement was reached. And I don't recall the
7 exact timing of that. But in any case there was an
8 out-of-court settlement, I guess is the right term -- it
9 was called a stipulation, in which we agreed to keep SVA
10 and the City, I believe, informed on any matters relative
11 to the subject. In fact we recently had some
12 correspondence with one of the representatives of SVA,
13 questioning us why haven't we received anything. The
14 answer we just gave back to them, our solicitor signed out
15 from our legal office, was that there isn't anything to
16 give you. But when there is in the future, you will
17 certainly get it.

18 I think both of these agreements, the operative
19 portions of them really just formalize things that would
20 have been done in any case. I think we have kept the
21 public pretty well informed on this subject.

22 There are some other unique aspects of any
23 approval action that we might take, no matter what
24 direction the disposition of this water might take.

25 This is the only subject matter that the

1 Commission themselves, the NRC commissioners themselves
2 have reserved for themselves to make the final
3 determination. Back in April of 1981, my office was given
4 the authority by the Commission to approve all cleanup
5 activities that were within the scope of the Programmatic
6 Environmental Impact Statement, with the exception of the
7 water question, this processed accident water disposition
8 question. They have required us by that agreement, which
9 remains in effect, not agreement but policy statement that
10 remains in effect to ultimately come back to them. So
11 before the staff takes action on any proposal, it will be
12 concurred in or agreed upon basically by the heads of our
13 agency. So that is the importance which they place on this.

14 I know that the present commissioners are well
15 aware of this. We have discussed it with them on occasion.
16 I am sure that they are going to require a very
17 comprehensive review both by us and by the licensee.

18 So I think the bottom line here really is that
19 there are a lot of mechanisms that are in place to make
20 sure that the public interest is obtained and the highest
21 levels of the agency will be involved in any decision and
22 very frankly, it is not a paramount issue by any means in
23 the cleanup today. A year and a half from now or
24 thereabouts, the end of 1986, if and when we get a proposal
25 from GPU, then I think it will become a significant issue

1 to be treated.

2 If you have any questions, I will be glad to
3 answer them.

4 MR. MORRIS: Anybody have any questions?

5 Thank you very much. We can go right to the --

6 MR. DEVINE: I want to correct a number which I
7 gave to Tom. I had indicated about 1000 per year, he asked
8 about Three Mile Island 1. The four years that TMI was
9 operating steadily, it ranged from about 155 to 463.

10 MR. MORRIS: Sorry you asked now, aren't you?

11 MR. COCHRAN: No.

12 MR. MORRIS: What we would do is go right to the
13 public comment. I thought you might catch me. There is an
14 outstanding question to be answered.

15 Is Thomas still in the crowd?

16 Would you come forward? Do you recall the
17 question?

18 MR. MAGETTE: I believe the question was that
19 someone in my family might oppose discharge even though I
20 thought it was okay.

21 The issue has been raised that although there
22 may not be any health impact for environmental concern with
23 the discharge of the processed water, that there may indeed
24 be a certain avoidance of Chesapeake Bay seafood products
25 because of a perceived, although not actually existing,

1 health problem on the part of the general public. In other
2 words, someone might think there is a problem before we say
3 there isn't one and because of that might say, well I might
4 as well buy my crabs from Louisiana just to make sure.

5 The position of the state is that we don't have
6 a position. We don't necessarily oppose it. We certainly
7 don't accept that discharge is on the face an acceptable
8 solution, even though we do say that there are no health
9 impacts associated with that discharge.

10 So we would basically participate in the process
11 that Bernie outlined as far as commenting on the draft
12 environmental impact statement, making any such
13 determinations as we were able to in order to quantify or
14 evaluate some sort of perceived avoidance of Chesapeake Bay
15 products, and reach a position on the part of the state
16 which would be basically entered into the regulatory
17 proceeding. So that is why I can't say that the state
18 doesn't find no problem with discharging the water.

19 MR. MORRIS: Tom?

20 MR. SMITHGALL: Would there be a difference in
21 your opinion if the discharge point were at the Mason-Dixon
22 line or at the TMI site?

23 MR. MAGETTE: No.

24 MR. MORRIS: What I am hearing you saying is
25 that at this point your governor does not have a position

1 one way or the other on this issue?

2 MR. MAGETTE: That is correct.

3 MR. MORRIS: Okay. Fine.

4 MR. GERUSKY: You would need a permit from DER
5 to have a host that long. So I think they are in trouble.

6 (Laughter.)

7 MR. MORRIS: Okay. If there are people from the
8 public that would like to be recognized, I have been -- I
9 know there are two. I have been asked to allow time for
10 Joyce Corradi and Deb Davenport. If they are present, I
11 would remind them, I know that they have been at other
12 meetings, in order to allow public comment, I am going to
13 ask that they limit their involvement to five minutes each
14 at the most. And so, we haven't started your clock ticking
15 yet. Who else would like to be recognized?

16 I see about seven, okay. Which means we are
17 going to go on to probably about 9:25. I am going to
18 really be prepared when you come up here; I am going to be
19 very tough on the five-minute rule. We have to do that to
20 give everybody an opportunity and particularly in the
21 beginning. So you are on.

22 MS. DAVENPORT: I just wanted to ask for half an
23 hour in the next meeting in October so that Marjory Mott
24 can address the panel on her response to Dr. Topaz'
25 Pennsylvania health study.

1 MR. MORRIS: Your five minutes is ticking. You
2 are asking this for who?

3 MS. DAVENPORT: For Marjory to respond to the
4 Pennsylvania State Health Department study on cancer
5 effects.

6 MR. MORRIS: I will make a note of that for the
7 next meeting because we are going to discuss agenda items
8 when the public comments finish.

9 MS. DAVENPORT: I wanted to say that there will
10 be a press conference on Friday morning in the Barclay
11 Hotel in Philadelphia at 11:00 where there will also be a
12 response to the health department study.

13 In addition, I have my own question regarding
14 the processed water. I want to know a little bit more
15 about advanced notification. How will the notice be given
16 to the public? How can the tech specs -- who will be told
17 that there is a change in and will this just go through
18 maybe the Federal Register or will various parties be
19 notified, will public meetings be held?

20 MR. SNYDER: Everyone that is interested will be
21 well informed on that subject, I am sure of that.

22 MS. DAVENPORT: That was my question. Thank you.

23 MS. CORRADI: We represent concerned mothers and
24 women. One of the questions I wanted to ask in the last
25 weekly status report, there was a statement concerning the

1 seismographic changes exemption. I would like to know what
2 does that concern? What all does that involve?

3 MR. TRAVERS: I am Bill Travers, deputy director
4 of Three Mile Island program. You are talking about an
5 item that we listed under work in progress or work being
6 evaluated by the NRC staff. Basically what we are
7 evaluating is a request by GPU Nuclear to receive an
8 exemption to certain seismic criteria normally applied to
9 operating reactors. They made a justification that argues
10 that for systems, mainly temporary systems used in recovery
11 or cleanup operations, that the same criteria normally
12 applied to operating plants ought not to be applied to
13 those systems.

14 MS. CORRADI: Do they not have to have the
15 equipment at all?

16 MR. TRAVERS: It means that certain structural
17 requirements that might be applied to demonstrate seismic
18 qualification and purchasing of tested and validated
19 equipment would not be necessarily required in some of the
20 systems that we are proposing to use or that they are using.

21 MS. CORRADI: What is the reason for this?

22 MR. TRAVERS: Part of the rationale is that the
23 systems in question are temporary and they won't be used
24 over the normal 30-year, 40-year life of the plant. As a
25 result, the opportunity for a seismic event is minimized.

1 Another argument that I believe they would use
2 is that even if a seismic event were to occur, the
3 demonstrated impacts associated with the systems in
4 question wouldn't result in a release or an environmental
5 impact of very much significance.

6 MS. CORRADI: Even though we have had a seismic
7 happening in the last three years.

8 Okay. My next question is on the loading of the
9 cannisters. I would like some clarification. I didn't
10 really understand when the presentation was presented.
11 Exactly how many cannisters are totally needed for the
12 operation and when will all of those cannisters be present
13 on the island?

14 MR. STANDERFER: I might ask -- answer that. We
15 are currently projecting 280 cannisters total. And those
16 should be shipped from the island by the early part of 1988.

17 MS. CORRADI: Okay. One other question I would
18 like to ask is, we recently heard about marijuana plants at
19 the island. Our concern isn't so much the marijuana plants
20 as did someone actually have access other than people who
21 work there to get these plants on the island. How good is
22 security as far as the protection of the island?

23 MR. STANDERFER: This was on the southern end of
24 the island. Anybody operating a boat on the Susquehanna
25 River could, while they are trespassing, could stop their

1 boat on the southern end of the island and step off. That
2 part of the island is removed from the nuclear facilities
3 and are not included within the plant's security area.

4 MS. CORRADI: Am I correct to understand that
5 you don't actively patrol the entire island, just the
6 secured --

7 MR. STANDERFER: We patrol the island, but it is
8 possible that someone could step off onto the island and
9 that would be --

10 MS. CORRADI: They plant the plants and then
11 take care of them?

12 MR. STANDERFER: Yes. In fact fisherman fish
13 around the island.

14 MS. CORRADI: That has been acceptable by the
15 NRC -- is that a procedure that the NRC finds acceptable as
16 far as their protection of the island from people who are
17 not supposed to be there?

18 MR. TRAVERS: Yes. The NRC's requirements deal
19 mainly with the nuclear facilities and this is an area far
20 removed from that.

21 MS. CORRADI: When you say the nuclear
22 facilities, you are only talking about the area within the
23 fenced-in --

24 MR. TRAVERS: Protected area of the plant is the
25 area that is the main focus of NRC's safeguards

1 requirements.

2 MS. CORRADI: So if boaters who wish to be, say
3 suppose in our wildest imagination antinuclear activists
4 went on the island and posted signs there, there would not
5 be anyone interested in confiscating those signs?

6 MR. MORRIS: That is -- first of all, the time
7 limit is gone, but I think that they explained it that
8 people are not supposed to be on the island but it is
9 possible outside the fenced in area that people could get
10 on the island while they are not supposed to be there. I
11 would assume if somebody is putting up signs they would be
12 removed or arrested or whatever the people want to do. But
13 the NRC is concerned about the fenced-in area particularly.
14 If I am speaking out of line, somebody should direct me,
15 but I am trying to keep it going a little bit.

16 MS. CORRADI: If boaters actually trespassed on
17 the island, they would be, that would be considered an
18 illegality, too.

19 MR. MORRIS: Again, I think GPU has said that
20 they are not supposed to be doing that, but they could do
21 it. It is possible.

22 MR. COCHRAN: The purpose of the dose
23 assessments, is that into the island off-site or on-site?

24 MR. TRAVERS: Maybe you could clarify the
25 question. Are you asking me a question?

1 MR. COCHRAN: When you do an analysis, is the
2 man growing the marijuana at the end of the island on-site
3 or off-site?

4 MR. TRAVERS: One of the things that you
5 probably know is assumed is that the person at the fence
6 post is there 24 hours a day, seven days a week. So if the
7 marijuana grower happens to be three miles down from the
8 north end of the island, it is highly unlikely he is going
9 to be a maximum dosed individual.

10 MR. COCHRAN: The hypothetical individual at the
11 fence post does not have to be there --

12 MR. TRAVERS: I don't know where the fence post
13 in this case is.

14 MS. KINNEY: Paula Kinney. With all due respect,
15 the agenda says public comment, 60 minutes. That is only
16 fair. We have to drive home to Middletown, too.

17 MR. MORRIS: Let me remind, so that everybody
18 clearly understands what I have outlined as public comment
19 parameters, I explained at length at the last meeting -- I
20 am not going to go through this every meeting -- that
21 public comment will be five minutes, limited to five
22 minutes so that we can get everybody in. When there is
23 only one person, that could be five minutes of public
24 comment. It doesn't mean to say we have to go for 60
25 minutes. There are five minutes of public comment for

1 person. If you want more understanding, if you want more
2 than that, you can't just get more by saying you want to be
3 listed under public comment, because all that does is get
4 you on first. You have gotten that tonight. If you want
5 more than five minutes, say you want 40 minutes. We are
6 going to discuss them as an agenda item. If we agree, we
7 will put them on the agenda so they will get 40 minutes.
8 If you want more than five, we will consider that
9 separately so that we can have an agenda completed within a
10 certain time period. If you don't ask for that, if you
11 just call up and say, I want on public comment, you are
12 only going to get five minutes.

13 MS. KINNEY: I understand. I am not going to
14 even take three minutes. My question is, if there are
15 enough people here who want to make a comment, you will
16 give them the --

17 MR. MORRIS: We will give people the opportunity.
18 But it is going to be limit to five minutes. If there are
19 enough, then we will go an hour.

20 MS. KINNEY: Okay.

21 MR. MORRIS: I said that means we will be done
22 about 9:30.

23 MS. KINNEY: But a question may arise while we
24 are talking.

25 I will get on to the question. Two questions.

1 The first one concerns you. I am certainly not going into
2 the mislabeleding of the waste and so on and GPU losing the
3 license for the week. My point, my question is, when that
4 happened and they lost their license for the week, for the
5 period of time, I know that you weren't notified either by
6 the NRC or GPU. A, I want to know if that is acceptable to
7 the panel, if that is okay. And if it is not, has anything
8 been done? Is there any other, have you talked to them?

9 MR. MORRIS: I made contacts specifically on
10 that because quite honestly I was called by two people from
11 the public. I didn't know what was going on. I contacted
12 the NRC directly and I indicated that I was not real happy
13 about the fact that I had not been notified. I told them
14 in the future when events like that happened, that I would
15 appreciate at least getting some kind of notification
16 because people call me. I wanted to be able to tell them
17 what I wanted.

18 MS. KINNEY: So now they know that they are to --

19 MR. MORRIS: It is judgmental. They have to
20 decide for themselves.

21 MS. KINNEY: I would think losing their license
22 for a week --

23 MR. MORRIS: For the most part they do a pretty
24 good job on that. On that particular case, I don't think
25 they did. I told them. I expressed that. But it is all

1 judgmental. They have to decide what they feel is. I
2 don't want to know every single item.

3 MS. KINNEY: I agree.

4 MR. GERUSKY: The state was notified by the
5 state of Washington and GPU and NRC. So we knew about it
6 as it was happening.

7 MS. KINNEY: So when we have wind of a problem
8 and it concerns the cleanup, do we call someone for
9 clarification on the Citizens Advisory or do we call the
10 state?

11 MR. MORRIS: I think, I would suggest you call
12 the program office or you call the state. But people have
13 told me they prefer to call me. That is what happened in
14 this case. I am willing to speak to them if I know
15 something. I think the NRC knows that as chairman I am
16 going to get some calls. Again, I have expressed that. So
17 you can feel free to call the program office, DVR, or you
18 could call me.

19 MR. COCHRAN: When you call the mayor, ask him
20 to tell the other members of the panel.

21 MS. KINNEY: That was judgmental, Tom.

22 MR. COCHRAN: That is right.

23 MS. KINNEY: My second question was for Ann, but
24 she is not here. Because I have four kids, three in high
25 school, she has kids in high school and it is concerning

1 the evacuation in Middletown school district. They have
2 split sessions now. The junior high goes from 1:00 and is
3 home at 6 and my kids go at 7 and they are home like 12:30.
4 I would like to know if there have been any provisions for
5 the change in the hours of school and so forth in case
6 there is a problem with the cleanup?

7 MR. MORRIS: In which evacuation plan? The
8 county's?

9 MS. KINNEY: Well, the state, the county,
10 whatever.

11 MR. GERUSKY: That is the school district's
12 responsibility and you have to ask the school district.

13 MS. KINNEY: It does not have to to be approved
14 by the state?

15 MR. GERUSKY: No.

16 MS. KINNEY: Just the school district. Nor the
17 county, just the school district.

18 MR. GERUSKY: That is right.

19 MS. KINNEY: What if they have done nothing?
20 Where do we go from there?

21 MR. MORRIS: What if the school district hasn't?
22 Then you should make sure, you should go after them and see
23 that they do. Your individual elected officials have
24 responsibility.

25 MS. KINNEY: But that is up to the school

1 district.

2 MR. MORRIS: I assume that they would coordinate
3 their efforts with their county's emergency management
4 people. But apparently the school districts are the ones
5 that should be initiating that. If they are not, that is
6 where you should go.

7 MR. GERUSKY: The school district must have
8 plans, acceptable plans for changes in those. Minor
9 changes in those plans don't have to be approved. If there
10 are major changes in the plan and they haven't been made,
11 then the county and state civil defense people should be
12 contacted, either one, and ask them if the plans have been
13 changed. They will check for you.

14 MS. KINNEY: Okay. So you say to check with the
15 state?

16 MR. GERUSKY: With the county first. The
17 responsibility goes up.

18 MS. KINNEY: Okay.

19 MR. GERUSKY: It starts at the lowest level.
20 They are the people responsible. And then it goes up to
21 the community, the county, the state.

22 MS. KINNEY: Thank you very much.

23 MR. KABLER: Mr. Morris, members of the
24 Commission, my name is John Kabler, I am director of the
25 Chesapeake Region of the Clean Water Accident Project, a

1 regional division of a national environmental organization.
2 We have about 100,000 members in Maryland and 100,000
3 members in Virginia, all of whom I believe have signed a
4 petition as a party opposed to the dumping of radioactive
5 waste water from Three Mile Island into the bay.

6 The last time that my organization was involved,
7 however, in working on this issue, I believe was 1980
8 during a time when there were a number of hearings put on
9 by the NRC in Maryland to talk about the Three Mile Island
10 cleanup and the focus at the time was on the possible
11 release of radioactive waste water.

12 At the end of those hearings and sometime around
13 the City of Lancaster agreement, I recall newspaper
14 articles that were similar to the statement made by
15 Mr. Gerusky that the perception of contamination of seafood
16 was something that was taken seriously in Maryland and that
17 no water would be released until such time as the public
18 opposition to it cooled down or people felt differently
19 about the problem. From my perspective and my organization,
20 the fact of the accident itself and the widely reported
21 improprieties by GPU staff haven't done very much to allay
22 fears that the cleanup is being handled safely or that the
23 waste water, were it to be considered for release, would
24 really be safe just because GPU said it was safe.

25 What I am trying to say is that I think we are

1 still dealing with perceptions in Maryland and that the
2 integrity of GPU is held in question by people in the state.
3 In any case, as I am sure most of you know that context in
4 Maryland around the bay has changed. The governor's bay
5 bills, 33 initiatives, \$50 million approximately being
6 spent on those, we have a bill banning the sale of
7 phosphorous based laundry detergents and the one of the 10
8 initiatives, the critical areas bill which is being voted
9 on and will be voted on finally in the legislature this
10 winter, will probably pass, has people in Maryland
11 concerned about the bay arguing about things like this:
12 Can you cut down a poplar tree within a hundred feet of the
13 bay or not. And can you build a house at all within a
14 hundred feet of the bay. People argue over whether a cow
15 shall be allowed to walk into the bay or near the bay or a
16 tributary of the bay or not because of the potential for
17 pollution.

18 The point I am trying to make is that I think
19 the context in Maryland is such that the idea of
20 radioactive waste water from Three Mile Island being
21 released into the Susquehanna would not be a popular idea
22 at all.

23 My organization, or speaking for my organization,
24 I would suggest that the panel advises NRC to keep the
25 radioactive waste water on the island, unless some method

1 can be found to treat it or make it safe, and that the
2 final say as to whether it is safe or not be something that
3 is decided by environmental groups, by public interest
4 organizations in the state who would need to be convinced
5 that it is safe in order to avoid what I think would be
6 inevitable if the water were released and people didn't
7 think it was safe, which would be organized and spawn
8 opposition from fisherman and environmental groups and from
9 people who drink water, eat seafood or care about the bay
10 or politicians.

11 I appreciate the opportunity to speak before you.

12 I would like to add, though, that I didn't
13 receive any notification of this meeting. I think if there
14 is some way that I could arrange for my organization to be
15 notified when there is a meeting of this sort held in the
16 state, I would appreciate it. I used to be on the mailing
17 list.

18 MR. MORRIS: I think if you give your name
19 tonight to Randy, he would notify you of every meeting we
20 have and you would have to see where it is located and
21 whether you could go. They couldn't just probably,
22 depending on meeting location, have different lists. If
23 you give them your name, I am sure they will notify you and
24 send you that, what is it, a weekly --

25 MR. HALL: A status report.

1 MR. KABLER: Thank you very much. If dumping
2 the water into the river is truly an option a year and a
3 half from now, we will be back to talk about it.

4 MR. MORRIS: As an individual, I would encourage
5 that. I appreciate your comments.

6 MR. COCHRAN: Your position or the position of
7 your organization with respect to that dumping of the water
8 and the petition, is that based on your own analysis of
9 whether it is safe or a fear that it might not be safe?

10 MR. KABLER: We are unable to make an analysis
11 in-house. During the initial months after the cleanup or
12 the year or so after the accident, we talked to a number of
13 scientists and we found that some scientists thought that
14 projected releases of water would be safe and other
15 scientists thought that it wouldn't be safe. There seemed
16 to be no clear consensus in the scientific community on
17 what the effects of tritium are. We went through that
18 whole long argument and the short answer to your question
19 is, it is based on our fear that it might not be safe.

20 MR. MORRIS: Thank you.

21 Back here.

22 MR. DONNAY: I am the director of Nuclear Free
23 America in Baltimore. I have a degree in radioactive waste
24 engineering disposal. I went to Johns Hopkins. I have
25 worked on low level radioactive waste disposal problems for

1 the state. This is the first such meeting I have attended.
2 I am glad I had the opportunity. I have questions for the
3 panel and for the speakers. I am allowed to ask you
4 questions?

5 MR. MORRIS: Surely.

6 MR. DONNAY: First, for people who made the GPU
7 presentation on the status of the accident water at Three
8 Mile Island 2: What is the total cumulative load of curies
9 that has been removed from the accident water and shipped
10 off-site via processing? In other words, I am not
11 interested in the amount of curies that have decayed but
12 the amount that has been removed and shipped off-site.

13 MR. DEVINE: It is in the hundreds of thousands
14 of curies. I have got some specifics here. If you give me
15 about two minutes.

16 MR. DONNAY: Hundreds of thousands of curies. I
17 ask that question because I am concerned that as the
18 cleanup continues and as the treated water is recycled to
19 be used in the cleanup operations, a great deal of
20 radioactivity is still going to be contaminating this water
21 and this water will have to be cleaned and shipped off-site,
22 the contaminants. It seems very premature to think about
23 what the water will be like because we are talking about
24 releasing, whether it is in the Susquehanna or wherever at
25 this point, when really no major operations have yet been

1 done inside the core and we see from the table that was
2 presented of where these curies are in the auxiliary
3 building, fuel handling and within the reactor coolant
4 system, that there is still tremendous potential for
5 contamination here. The schedules that the NRC has
6 provided and also that GPU have provided show the disposal
7 of the processed accident water as the second to last step
8 in this complete decontamination.

9 MR. MORRIS: So that you know, the schedule that
10 -- NRC is not even scheduled to make a decision on the
11 disposal of water until the middle of 1987. We are
12 discussing it tonight simply because of the concern that
13 has been expressed from people in Maryland, not because it
14 is going to be a decision that is imminent.

15 MR. DONNAY: I am concerned from an engineering
16 perspective and a radioactive waste proposal perspective.
17 I don't see how we can have any idea what this water is
18 going to be like by the time we are ready to dispose of it.
19 Although a presentation and a case is being made and I am
20 very concerned that the gentleman from the Maryland Power
21 Plant Siting Program thinks that at this point the water
22 would be acceptable for release into the bay, and that in
23 terms of tritium load this may be only 2 or 3 times greater
24 than when a normal power plant would release in a year,
25 that if you look at that when this process is finished, I

1 don't think it is going to look like a normal, within a
2 normal framework of tritium loads from operating power
3 plants.

4 MR. MORRIS: Does anybody want to speak to that?

5 MR. DEVINE: Just briefly. I hope the statement
6 wasn't too reckless. We have six years of experience in
7 processing water. Regardless of how much, how high the
8 contamination is in the water when it begins to be
9 processed, we have a very precise handle on how clean the
10 water is when it is processed, when the process is complete.
11 The basis for my statement was exactly that. It is really
12 not important in terms of predicting the end product to
13 know how much contamination might still get in that water
14 during the defueling process. You are correct in the sense
15 that we will be introducing more fission products activity
16 to the water during the defueling, but our ability to
17 process has been demonstrated definitively.

18 MR. COCHRAN: But you don't remove the tritium.

19 MR. DEVINE: You are right. I was really
20 addressing the fission product activity. The total tritium
21 inventory is relatively low and the opportunity to continue
22 to add tritium is similarly relatively low. Something like
23 4000 curies total exists as a result of the operation of
24 the plant before the accident.

25 MR. DONNAY: I am glad it has been acknowledged.

1 The thing I would like to say as a citizen of
2 Maryland again is that I am very unhappy with the position
3 of the Maryland Power Plant Siting Program. I can't
4 believe that they are speaking like that in public. But it
5 is the first time I have come out here to hear it.

6 The other thing I would like to say is that, or
7 I would like to ask is, has this panel as a body ever
8 received public health information from the state of
9 Maryland regarding any public health statistics in Maryland
10 since the accident? Infant mortality, anything from
11 neighboring states or any such data?

12 MR. MORRIS: I am not aware that we received any
13 directly. Quite honestly, until very recently, we aren't
14 really supposed to be getting into the health effects of
15 the accident. We have recently, as I said at the beginning
16 of the meeting here, been given the authority now, a change
17 in our charter for us to be able to be used as a conduit to
18 discuss the health effects, any health effects studies, so
19 that we could invite somebody to make a presentation on
20 what their study says, to give the public an opportunity to
21 ask questions and learn about the study. That I am
22 paraphrasing now but that is basically the role we are
23 supposed to be playing. Unless somebody else on the panel --

24 MR. COCHRAN: Bear in mind that Henry Wagner sat
25 on this committee for a number of years and well

1 represented the views of the state of Maryland.

2 MR. DONNAY: I don't question Dr. Wagner's
3 credentials. I know Dr. Wagner from the school of hygiene.
4 I am just wondering whether or not the state has come to
5 you and presented or studied --

6 MR. MORRIS: No.

7 MR. DONNAY: I ask that to bring up one point.
8 I haven't done a thorough study but I have one piece of
9 data that suggests more investigation is needed. This data
10 is from the U.S. Monthly Vital Statistics. It is a survey
11 of infant mortality in Maryland, specifically looking at
12 1980 when the Krypton-85 was vented from TMI. The
13 background level, at this level for many years in Maryland,
14 infant mortality rates per thousand births has been in the
15 range from about 9 deaths per thousand to 12 or 13. The
16 average is about 10. And in the months leading up to the
17 release, which I believe was in June and July, the rate
18 varied from 9, 13, 12, 11 -- it was 10.9 in May. It jumped
19 in June and then in July. In July it was 29.1. That is
20 almost a tripling. That spike quickly disappeared again.
21 By April it was back down to 15 and by August it was back
22 down to 15. And in September back down to 10. Then it
23 continued about 10 deaths per thousand through the end of
24 the year.

25 You can see from there, it is quite a tall spike.

1 I just present that to you.

2 MR. MORRIS: What you could do, if you would, if
3 you are interested in providing that to the panel, you
4 could either provide the statement for it as part of the
5 record or you could make copies and send them to the panel.

6 MR. DONNAY: I will make copies of this and
7 submit it to you.

8 MR. MORRIS: You could make contact with Randy
9 Hall and provide him with a copy of whatever the number of
10 copies he needs. He would see that we got it. What that
11 will do is give the panel members a chance to review it.
12 If they have any special interest and feel that they would
13 like to pursue that area, then we could invite the person
14 who was responsible for that.

15 MR. DONNAY: I am not suggesting that this is
16 the only interpretation. But the correlation is
17 significant.

18 MR. COCHRAN: Is that from the state as a whole?

19 MR. DONNAY: That is the whole state, which of
20 course is skewed, and it should be looked at by county
21 because obviously the winds don't blow over the whole state.

22 MR. COCHRAN: Did you go back and look to see
23 where the plume went from the krypton venting?

24 MR. DONNAY: No. I am not even sure how I would
25 do that for that particular month.

1 MR. MORRIS: We cannot get into that tonight.

2 MR. DONNAY: I understand that. Thank you.

3 MR. MORRIS: I have been asked to give Tom a
4 chance to respond. I am not going to spend too much time
5 cutting into the public's time.

6 MR. MAGETTE: I can't address the health
7 statistics. I can only say that we did a TLD monitoring
8 program with TLDs that were specifically designed to detect
9 the krypton plume, and we deployed them all along the
10 Maryland-Pennsylvania border several months prior to and
11 during the venting and several months after the venting and
12 never detected any plume at all above background whatsoever.
13 That is just one point. I don't think you will ever be
14 able to statistically or any other way find a plume in
15 Maryland. That doesn't bear on the data specifically but
16 you will never track a plume in Maryland, no matter what
17 you do.

18 MR. OLIN: John Olin. I am a resident of
19 northern Baltimore County. I am here as a private citizen.
20 Listening to the testimony over the last three hours, I
21 feel like I have seen the trees but no forest. The larger
22 question of nuclear power in this country, I am sure all of
23 you gentlemen are more versed in it than I am, but it seems
24 to me that we have heard how -- we heard a lot of very
25 technical business as usual kinds of descriptions of the

1 activities at TMI-2. Everything is, as it were, full steam
2 ahead. Unit 1 may be opening shortly. Yet I would like to
3 remind everybody, it seems to me people need reminding
4 because nobody has mentioned it. It seems that the context
5 of any question should be mentioned at some point in any
6 reasonable discussion.

7 The context is that TMI was the worst commercial
8 nuclear accident in U.S. history. It is one that has
9 attracted the attention from all over the world. It is
10 central to the discussion of the future of nuclear power in
11 this country. We are given the impression tonight that all
12 is well. But for me, the lesson of TMI is that errors can
13 occur and potentially devastating errors can occur.

14 Another fact that I think is an overall context
15 for our discussion is that all radiation is hazardous.
16 Exceptionally so. Thirdly, there is no solution to the
17 waste disposal problem. And fourthly, nuclear power -- TMI,
18 Seabrook, you name which plant you will -- these are
19 exceptional costly. We are talking multibillion dollar
20 projects, projects that we were told in the '50s that would
21 be cheap to operate. That is the overall context.

22 MR. MORRIS: I appreciate you going through that.
23 Understand and realize that this is probably the first
24 meeting that you have been to that we hold. We are simply
25 an advisory panel to the NRC on the cleanup of TMI unit 2.

1 We aren't even supposed to or allowed to discuss other
2 plants. We can't even discuss the restart of unit 1.
3 Because that was not what we were established for. We have
4 a specific role to play, that is to comment on the cleanup
5 activities of this particular plant.

6 I just want you to understand, it is not that we
7 don't have interest in other areas but you must understand
8 that we have a role to play and we have to stay within that
9 role. We are not trying to sit here -- I don't think
10 anybody on this panel would sit up here and say that it is
11 business as usual at any time at TMI-2, because it was a
12 significant accident and that is why we spend three, four,
13 five, six hours of the month for five years volunteering
14 time on this panel.

15 We are not paid people for this. We are very
16 interested. We are also concerned as you.

17 MR. OLIN: Good luck.

18 MR. ADAMS: My concern is with the tasks that
19 the representative from DOE mentioned going out to Idaho.
20 They have a design life of 30 years. What happens with
21 these casks at the end of 30 years?

22 MR. BIXBY: I think you are talking about the
23 cannisters. The cannisters have a design life of 30 years.
24 It is expected that after 30 years that the repository will
25 be available for handling those particular fuel cannisters.

1 MR. ADAMS: So those facilities will be --

2 MR. BIXBY: That is mandated by Congress that
3 that should be replaced. It is mandated that those
4 facilities should be in place for a limit of 30 years.

5 MR. ADAMS: That is all. Thank you.

6 MR. MORRIS: Thank you.

7 MR. AMOSS: I am a Maryland State Senator. I
8 represent the area of almost all of Hartford County that
9 touches the Susquehanna River and all of Cecil County that
10 touches the Susquehanna River. That makes me border
11 Pennsylvania all along York County and Lancaster County.

12 MR. MORRIS: You are very fortunate, Senator.

13 MR. AMOSS: I know. You are fortunate, too,
14 because you have a very nice town.

15 I want to thank you all for having the meeting
16 in Maryland and I want to express my concern as I have in
17 Havre de Grace many times over the issue of the discharge
18 of the waste water and the outcome of it in the end. A
19 gentleman made a nice statement -- sometimes it doesn't
20 take much command of the English language nor words, but he
21 said he would pipe it to the Mason-Dixon line. I would
22 pipe it on to the Virginia line, but our problem is, we
23 have tidal water to come back and get us. Besides, the
24 beautiful swimmers, the crabs, they also come from that
25 area. So I really can't win.

1 The concerns are this. I think I hope they are
2 fostered within the committee, too. The fact that we do
3 have Three Mile Island and you do have some other
4 facilities. So if there is another accident or spill or
5 something unforeseen, we will have more than our share of
6 something we don't want. I really -- the other thing is,
7 we are not sure of the outcome nor is there any political
8 support for dumping the water and mixing it in the
9 Chesapeake Bay. The bottom line is, we are not sure what
10 it does. We will straighten out the planning, Power Plant
11 Siting Commission. We will take care of that.

12 It really isn't funny because I was quite
13 surprised and I think he is really speaking out of turn.
14 If he doesn't believe me, we will find out. But I do thank
15 you very, very much. I would like, I don't know if it is
16 possible, Mr. Mayor, I would like a transcript of the Power
17 Plant Siting's words, if it is possible.

18 MR. MORRIS: You can probably get an entire
19 transcript of this proceeding if you would be willing to
20 give a card to Randy Hall. It might really be easier to do
21 that so that you can take out of it, because there have
22 been different times when comments have been made.

23 MR. AMOSS: I just think that I would like to
24 have them.

25 MR. MORRIS: Let me just say, there was a

1 Senator Riley that was here earlier on that expressed a
2 concern about the dumping as well. So that --

3 MR. ADAMS: Well, Senator Riley represents --
4 Hartford County is split on the border. She represents the
5 Havre de Grace, Aberdeen and Edgewater that would border
6 the bay. I represent the northern section which is the
7 Darlington, up in to Delta. The edge of Delta,
8 Pennsylvania. But we realize the plants are there. We
9 realize we have to live with them. But we really are very
10 concerned about adding to something we don't know about.

11 MR. MORRIS: You know I represented the
12 community that sent \$80- to \$100,000 to block the dumping
13 initially.

14 MR. AMOSS: We thank you very much.

15 MR. MORRIS: I have a concern as a member of
16 this panel.

17 MR. ROTH: Have you done any polling among your
18 constituents on this as far as their feelings about dumping?

19 MR. ^{AMOSS}ADAMS: Well, we have the town of Parryville
20 and the town of Havre de Grace who also use the water of
21 the Susquehanna River. We have the Aberdeen proving
22 grounds which uses the water. But it would be hard to
23 convince a good military man that anything like that could
24 hurt them. However, I don't think the town of Hafdegras or
25 the mayor would politically want that to happen at all.

1 And nor would the town of Perryville. I can say that
2 confidently, nor the town of Port Deposit. You have Port
3 Deposit who draws water.

4 MR. ROTH: Do you find a number of people that
5 are very vehemently speaking against this, or is this
6 something you are just mentioning there. In other words,
7 trying to get a feel for what the public is feeling on the
8 issue, if anything, at this point down here.

9 MR. AMOSS: I think the public that are involved
10 on the bay and those towns drawing water from the bay would
11 be very much opposed to the dumping of the waste water into
12 the Susquehanna. I think they would have the same feeling
13 that I do. We are not sure of what it does. We know that
14 we have to take a certain amount from Three Mile Island.
15 And we would not want to take it voluntarily. In other
16 words, we wouldn't want to ask for it. When it can go
17 somewhere else, we would like it to do that.

18 MR. ROTH: The reason I asked, it is maybe a
19 little unfair, but I thought I would say it, is the fact
20 that I thought you being here, you might have a check
21 toward the cleanup. We used to kid Henry Wagner of when he
22 was going to bring the check since Maryland had some
23 interest, but they never paid.

24 MR. AMOSS: Let me express something to you.
25 You have what we call a dam in Maryland, it is called the

1 Conowingo. Your nice electric company collects electricity
2 from there at about \$2.02 on the kilowatt. They sell it
3 back to us for about 6 or 8. We think we are helping you
4 out.

5 MR. ROTH: Touche. I guess I shouldn't have
6 asked the question.

7 MR. AMOSS: We all have our problems.

8 MR. MORRIS: Thank you, Mr. Senator. We really
9 appreciate your coming.

10 MR. COCHRAN: You cut him off.

11 MR. MORRIS: No. I am trying to treat everybody
12 the same. So somebody doesn't say the Senator gets 10
13 minutes and they get five minutes. I am trying to be
14 consistent.

15 MS. CHAVEY: I was actually about to leave when
16 I am still puzzled by a statement made by the gentleman
17 over on the end of the front row where he mentions the fact
18 that non-edible fish had a measure of radiation where the
19 edible fish had none. I was wondering how --

20 MR. KIRK: That wasn't me.

21 MR. MORRIS: He is on the hot seat tonight.

22 MS. CHAVEY: Do the non-edible fish, are they --
23 they are not smart enough to stay away from radiation; is
24 that right?

25 MR. MAGETTE: Well, I don't think it is a matter

1 of selecting it to avoid radiation on the part of the fish.
2 It is very unusual to even find radiation from a power
3 plant in the forage species or the bait fish. It can
4 happen. It has happened on occasion. We have found it.
5 But it is very rare. If every bait fish had a large amount,
6 then you would undoubtedly expect to see some in the larger
7 fish. Although you are not sure how much. So the fact
8 that it is very small and very rare is at least partially
9 explanatory for why you wouldn't see it in edible species.

10 MS. CHAVEY: Don't fish eat each other, so
11 wouldn't they transfer that to the other one?

12 MR. MAGETTE: It is not an automatic transfer.
13 There is not an instantaneous accumulation up the chain
14 just because something accumulates or just because
15 something consumes another species. Just as you don't
16 necessarily retain everything you consume, the same thing
17 is certainly true of other species. It is not automatic.

18 It does occur, but it is not automatic.

19 MS. CHAVEY: I am not sure you clarified that.

20 MR. MORRIS: Thank you. The panel does need to
21 talk now about what we would like to have on the agenda for
22 the next meeting. We have had one request for a 40 minute
23 response by AAMODT's. They have asked for 40 minutes on
24 the agenda to respond to what the state health department
25 study recently indicated.

1 MR. MILLER: I do not think we should have an
2 outside critique of the Department of Health comments,
3 studies or whatever until such time as we have the
4 Department of Health in to present their study to us and to
5 allow us an opportunity to request them to make sure we
6 know exactly what their study is about and where they are
7 coming from.

8 I would also suggest that we not schedule any
9 public debates.

10 Therefore, I would recommend that if we are
11 going to go this route, we invite the Department of Health
12 or their representatives here for our next meeting and
13 postpone the AAMODT's until a meeting after that.

14 MR. MORRIS: I understand your point. Is there
15 anyone else who wants to speak to that?

16 I think it makes sense. There is no, there
17 should be no indication here that the AAMODT's would not be
18 given time on the following agenda to speak to it. But I
19 think it is only fair to have the health department --

20 MS. CORRADI: Are you guaranteeing that the
21 health department is coming next month?

22 MR. MORRIS: No. I think what I am hearing is
23 we would like to ask them to come and speak to the issue,
24 present it to us and allow us and the public, including the
25 AAMODT's, if they choose to come, to ask questions of the

1 department. But not to get into presenting counterpoints
2 at the next meeting by the AAMODT's, rather more inquiry
3 and discovery.

4 MS. CORRADI: I don't think that was their
5 intent. Their intent was for information, not a
6 counterpoint.

7 MR. MORRIS: But they would only be as any other
8 public individual at this point, given an opportunity to
9 ask questions. They would not be scheduled on the agenda
10 for 40 minutes.

11 MS. CORRADI: When would you know about the
12 health department coming? I assume you would have to go
13 through procedures.

14 MR. MORRIS: I would assume that Randy Hall
15 would work with hopefully maybe Tom Gerusky or somebody
16 could try to help us arrange for that. I am just rambling
17 on here to see if anybody agrees or disagrees with that.

18 When we would know -- I would think the next one
19 to two weeks we would know whether they can make it or not.

20 MR. COCHRAN: I would, I don't have any problem
21 with putting the AAMODT's on the same program. I don't
22 think they would need 40 minutes. Certainly they haven't
23 made a very convincing case so far through their
24 spokesperson. But it would seem to me to make as much
25 sense to put them on the same program where they could talk

1 about the same subject on the same issue.

2 MR. GERUSKY: I think it is ridiculous to do
3 that. First of all, what you do is, the first person on
4 the program gets the opportunity to talk to the public and
5 the press about what they want to talk about. Then
6 everybody leaves and the people later on the program don't
7 get that same opportunity. The press in particular leave
8 to get their stories in. Whoever is that person on the
9 program is going to get the press and that is what we want
10 to avoid. What we want to avoid is at this point our
11 benefiting either side greater than the other. I think we
12 ought to have them on individually.

13 The thing that sparked it was the health
14 department's release of their report. Let's ask the health
15 department. We have got copies of it. Let's ask the
16 health department to come in, present it and answer our
17 questions. Then the AAMODT's, if they have got something,
18 have them present it in writing the same way the health
19 department did. Then they come in and present their
20 findings on health department's findings and we can at
21 least get a chance to get some sense and reason out of this.
22 I think that it has gone far enough as it has.

23 If we extend it any further, we are not doing
24 our job. We have got to -- there is going to be a decision
25 made and I think we have to make it.

1 MR. MORRIS: The sense I am hearing at this
2 point is that we invite the health department to come. We
3 allow, I would assume, a pretty large segment of the agenda
4 for that purpose and give plenty of opportunity for
5 questions during and after the presentation from the public
6 and from the panel members. So that to me would probably
7 be maybe an hour-and-a-half or two-hour session.

8 MR. GERUSKY: That is a full agenda.

9 MR. MORRIS: Schedule nothing else for the next
10 meeting?

11 There is one other item that I wanted to bring
12 up. That was the transportation of the fuel. I would
13 personally like to see on this coming agenda, even if it is
14 only for an update and we limit ours to half an hour, 40
15 minutes, and then spend the rest of the time on this. I
16 think it is important that we --

17 MR. GERUSKY: As long as we make it really
18 separate from this.

19 MR. MORRIS: We would do that but we would make
20 sure we have plenty of time for this issue. Except for one
21 thing, that would be to give Bernie a chance to -- a chance
22 to give his good-byes and Frank a chance to explain again
23 as he did tonight, what we would probably -- we would give
24 the agency the chance, we will probably limit that to a
25 very, very brief update. And allow as much time as we can

1 on the agenda for this topic and the one on shipment of
2 fuel.

3 MR. COCHRAN: I would like to put in a request
4 at least for the following meeting, that we take up in some
5 detail the disposition of the waste after it leaves TMI. I
6 would like to understand what the burial criteria are for
7 the low level and so forth, low level waste and so forth.
8 And any of these variances, why some of these epicurie
9 resins aren't being buried as high level waste somewhere.

10 MR. MORRIS: All right.

11 MR. COCHRAN: I would just like to understand
12 that and go into enough depth that you get some feel for
13 what the regulations say and why they say it and what the
14 activity level is in the waste and where it is going.

15 MR. MORRIS: Okay.

16 Anything else that we want to bring up? So that
17 everybody here understands this, what we are going to end
18 up doing is something like this. Two hours for the health
19 department which will allow public questions and comment on
20 that issue, 30 minutes on fuel transportation which would
21 allow public comment on and 30 minutes for the agency, and
22 so there would be no scheduled regular public comment. It
23 would be sticking to the agenda I just outlined.

24 Unless anybody has a problem with that, that is
25 what we will be doing at the next meeting.

1 MR. ROTH: How about an update on the defueling
2 process, if you still have the October on that? End of
3 October? In other words, you would not have anything to
4 report?

5 MR. STANDERFER: I can continue giving a status
6 of the cleanup. That is no problem.

7 MR. ROTH: I mean anything in particular on the
8 defueling, that process itself?

9 MR. STANDERFER: Your meeting should be before
10 we are ready to go.

11 MR. ROTH: That is what I am asking. So there
12 is not really anything --

13 MR. MORRIS: We don't need a special agenda item
14 on that status. It would be better to do that in November.

15 MR. BIXBY: What is your thrust on the 30 minute
16 presentation for the fuel shipping?

17 MR. MORRIS: It is not so much, it is 30 minutes
18 total. That means we would ask questions on shipping route
19 and some questions on security during shipping. If 30
20 minutes you feel is doing a disservice, then we would have
21 to just not do it next time and schedule it again. We had
22 been asked by the public to get into that. We delayed it
23 from today's meeting because we felt it should be in
24 Harrisburg. We would like to have something on the agenda
25 for next month.

1 MR. BIXBY: I will check availability of our
2 transportation guy in headquarters and get that back to
3 Randy to see that he is available for that meeting.

4 MR. MORRIS: If you would do that and also find
5 out the length of time and if he feels that that just won't
6 do it justice, then what we would do is probably delay that
7 and hold it at another meeting.

8 MR. BIXBY: Okay.

9 MR. MORRIS: I think we do need to get into the
10 health department studies.

11 MR. BIXBY: I will get that back to Randy.

12 MR. MORRIS: Fine. Thank you very much.

13 MR. COCHRAN: This doesn't have to be on the
14 next agenda but following the discussions we had about the
15 Philadelphia Inquirer articles and the use by GPU of their
16 own Safety Advisory Committee's findings, Dr. Fletcher
17 called me, having read the transcripts, and said that he
18 thought his committee had been misrepresented. We
19 discussed whether it would be useful to have another
20 briefing by that committee to get on top of what the
21 current feelings are about the cleanup.

22 We haven't heard from them in a long time. It
23 might be useful to schedule a meeting just to see where
24 their thinking goes.

25 MR. MORRIS: So you are suggesting we invite

1 Dr. Fletcher to a future meeting to make a presentation.

2 MR. COCHRAN: I think we ought to schedule
3 something far enough in advance if we wanted to do this,
4 schedule it far enough in advance, that they could arrange
5 their meeting with GPU to coincide with one of our evening
6 meetings so that they could come over with that. And a
7 couple months, three months, that ought to give them plenty
8 of time to do that.

9 MR. MORRIS: Okay.

10 MR. COCHRAN: If we want to do it. It seems
11 pretty reasonable to me. I don't know what other people
12 think.

13 MR. MORRIS: Unless there is a problem, we can
14 go ahead and do it, unless somebody objects to that.

15 The next meeting would be the regular meeting
16 which would be the second Thursday of the month.

17 MR. WALD: I am going to be in New York.

18 MR. GERUSKY: Can you get a meeting room?

19 MR. MORRIS: What we do is pick a date and then
20 try to shoot for it. I am prepared to make the second
21 Thursday but I am not sure of my schedule for the rest of
22 the time. If the panel members would prefer to pick
23 another night here, then we would ask Randy maybe to try to
24 arrange it for that night.

25 MR. HALL: October 10 in Harrisburg?

1 MR. MORRIS: That is what I have. But -- how
2 many people can't make the second Thursday? Okay. Does
3 somebody want to offer another date.

4 MR. SMITHGALL: Can we make it a Tuesday or
5 Wednesday night of those weeks or -- I have a conflict with
6 Thursday evenings. I have a prior commitment for this
7 semester until December for Thursdays. I wouldn't be able
8 to make any of them.

9 MR. MORRIS: If somebody wants to offer a date,
10 we can talk about it.

11 MR. MORRIS: How about Wednesday the 16th?

12 MR. GERUSKY: How about Thursday the 10th?

13 (Laughter.)

14 MR. SMITHGALL: Thanks, Tom.

15 MR. MORRIS: Thursday the 10th, I certainly
16 prefer that.

17 How about the 16th?

18 MR. COCHRAN: That is fine.

19 MR. MORRIS: Anybody object to the 16th?

20 MR. DI NUNNO: I won't be back, but that is all
21 right. Who can't make it on the 16th besides Joe? I doubt
22 if I can.

23 How about the 23rd? Would the 23rd suit you
24 better?

25 MR. WALD: No.

1 MR. MORRIS: It looks like the 16th. Wednesday,
2 the 16th, 7:00 in Harrisburg is what we would shoot for.

3 We stand adjourned.

4 (Whereupon, at 9:45 p.m., the advisory panel
5 meeting was adjourned.)
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CERTIFICATE OF OFFICIAL REPORTER

This is to certify that the attached proceedings before the UNITED STATES NUCLEAR REGULATORY COMMISSION in the matter of:

NAME OF PROCEEDING: ADVISORY PANEL FOR THE DECONTAMINATION
OF THREE MILE ISLAND, UNIT 2

DOCKET NO.:

PLACE: Annapolis, Maryland

DATE: Wednesday, September 11, 1985

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission.

(sigt) Rebecca E. Eyster
(TYPED)

REBECCA E. EYSTER
Official Reporter
Ace-Federal Reporters, Inc.
Reporter's Affiliation

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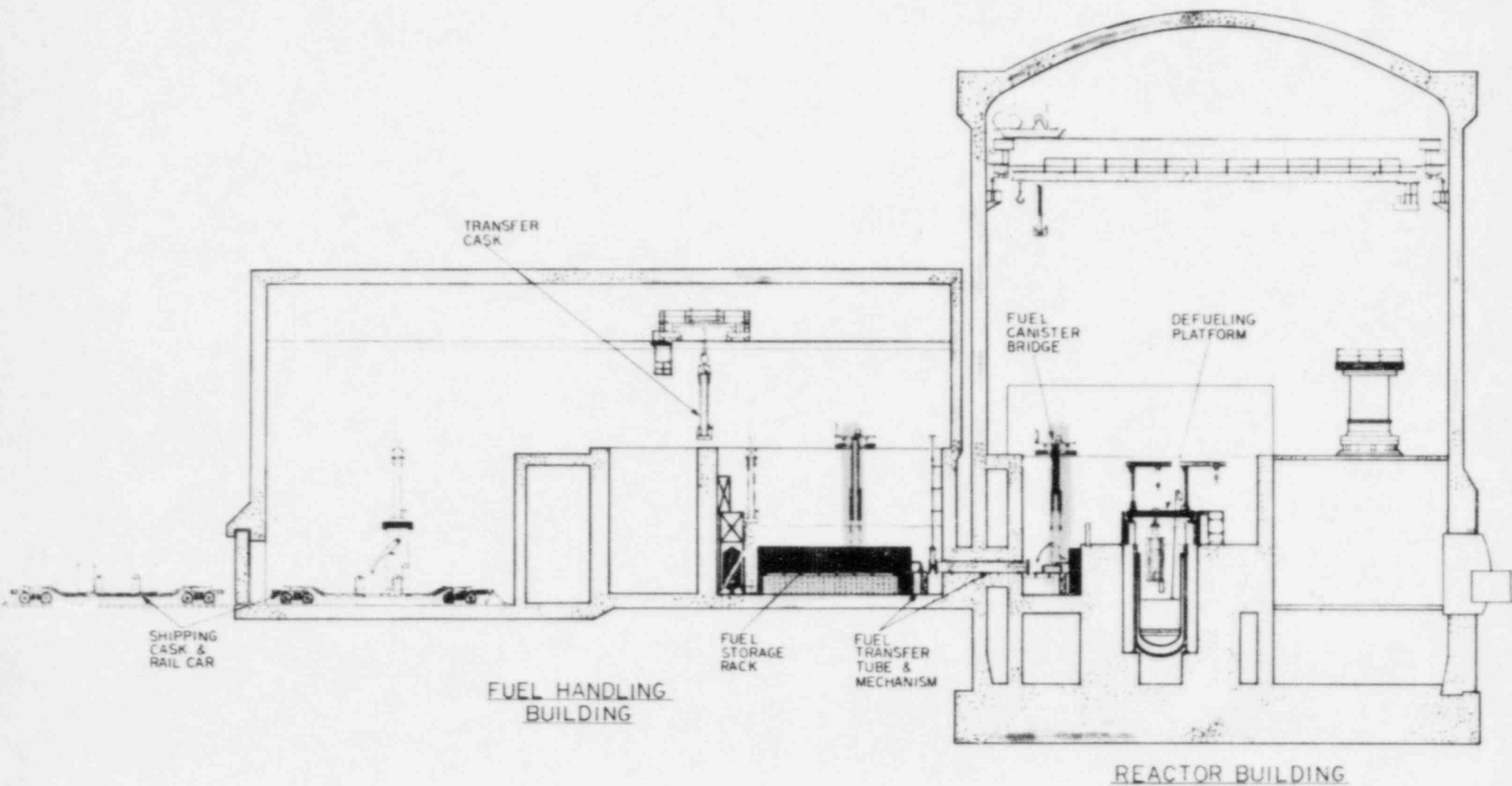
Meetings

- 1 March 20, 1980 - Tawes Building, Baltimore, MD
- 2 March 27, 1980 - State Office Building, Baltimore, MD
- 3 April 8, 1980 - TMI, Middletown, PA
- 4 April 17, 1980 - NRC, Bethesda, MD
- 5 September 12, 1980 - State Office Building, Baltimore, MD
- 6 October 2, 1980 - DNR, Annapolis, MD
- 7 October 30, 1980 - State Office Building, Baltimore, MD
- 8 January 19, 1981 - TMI, Middletown, PA
- 9 March 3, 1981 - State Office Building, Baltimore, MD
- 10 April 23, 1981 - DNR, Annapolis, MD
- 11 November 10, 1981 - State Office Building, Baltimore, MD
- 12 February 8, 1982 - State Office Building, Baltimore, MD
- 13 September 30, 1982 - TMI, Middletown, PA
- 14 August 9, 1983 - TMI, Middletown, PA
- 15 Feb. 6, 1984 - State Office Building, Baltimore, MD
- 16 August 10, 1984 - TMI, Middletown, PA
- 17 April 10, 1985 - TMI, Middletown, PA

dml

DISKETTE 48B-11

TMI-2 DEFUELING PLAN



FUEL STORAGE RACK 1 — DELIVERED

FUEL STORAGE RACK 2 — DELIVERED

FUEL STORAGE RACK 3 — DELIVERED

FUEL STORAGE RACK 4 — TO SHIP 9/11/85

FUEL TRANSFER SHIELD — FUEL HANDLING BUILDING— DELIVERED

FUEL TRANSFER SHIELD — REACTOR BUILDING — TO SHIP 9/14/85

CANNISTERS — (FUEL, FILTER, KNOCKOUT)

CANISTERS FOR TMI-2 FUEL

<u>ORIGINAL CONTRACT</u>	<u>TOTAL</u>	<u>FUEL</u>	<u>FILTER</u>	<u>KNOCKOUT</u>
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NES	250	= 77	+ 39	+ 134
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CURRENT CONTRACTS

NES	81	35	18	28
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B&W	21	0	21	0
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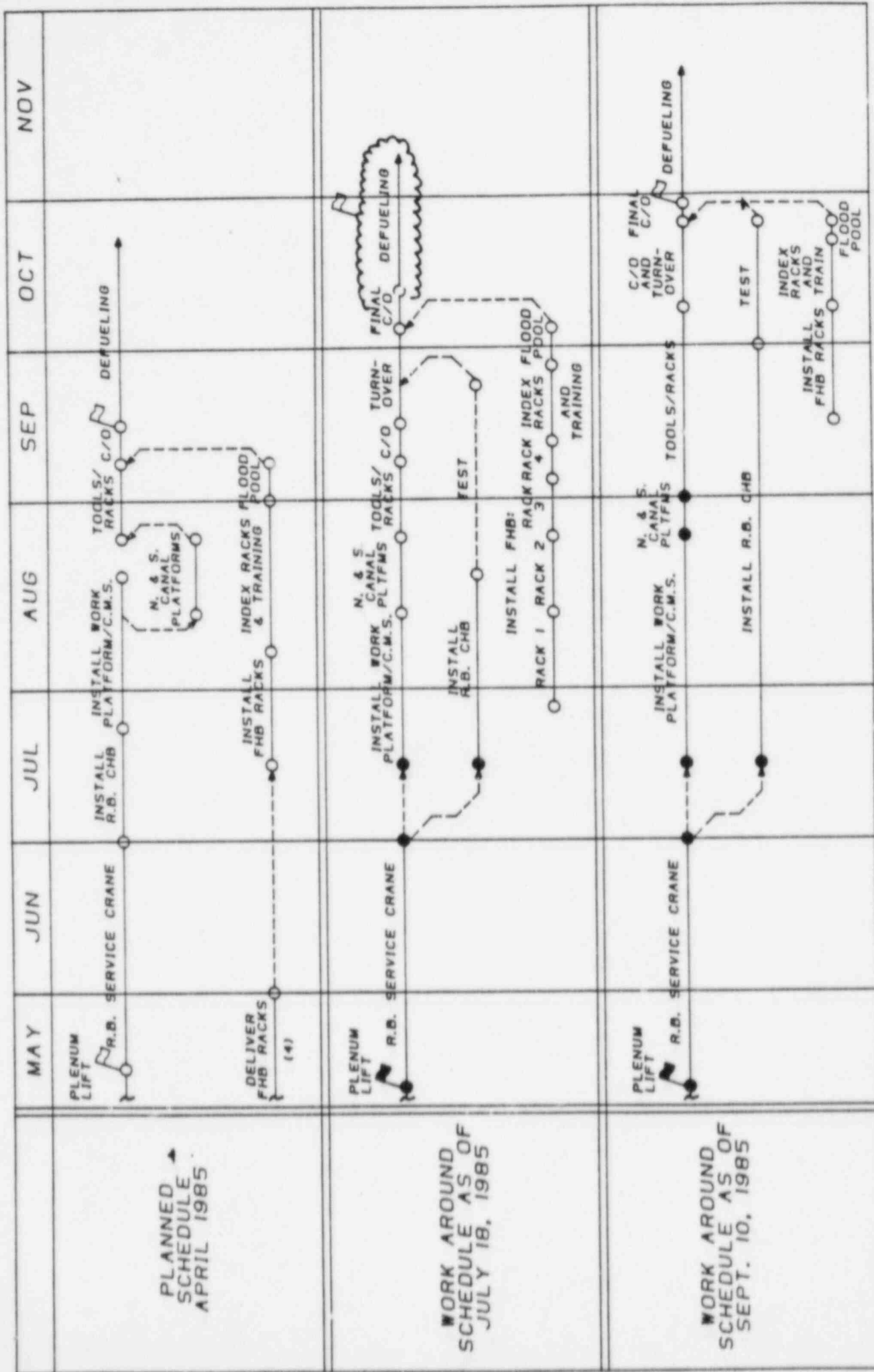
OAT	<u>148</u>	<u>42</u>	<u>0</u>	<u>106</u>
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SUB TOTAL	250	77	39	134
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OAT (new)	<u>30</u>	<u>30</u>	<u>—</u>	<u>—</u>
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TOTAL	280	107	39	134
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9/5/85



SUMMARY OF RECOVERY PROGRAM ESTIMATE
(\$x1,000,000)

<u>Estimate</u>	<u>Estimated Program Completion Date</u>	<u>Program Cost</u>
Defueling Study Aug. 1984	Sep. 1988	967
Recovery Program Estimate, Rev.3 Aug. 1985	Sep. 1988	965

EEI FUNDING OF THE CLEANUP

• RECEIVED THROUGH JULY 3, 1985	\$ 20,913,710
• RECEIVED THROUGH JULY 31, 1985	<u>3,001,113</u>
	23,914,823
• REMAINDER FOR 1985	<u>1,085,177</u>
	\$ 25,000,000

PROJECT ORGANIZATION CHANGE

SEPTEMBER 3, 1985

- **CONSOLIDATED DECONTAMINATION ACTIVITIES**
- **CONSOLIDATED WASTE MANAGEMENT ACTIVITIES**

TMI-2

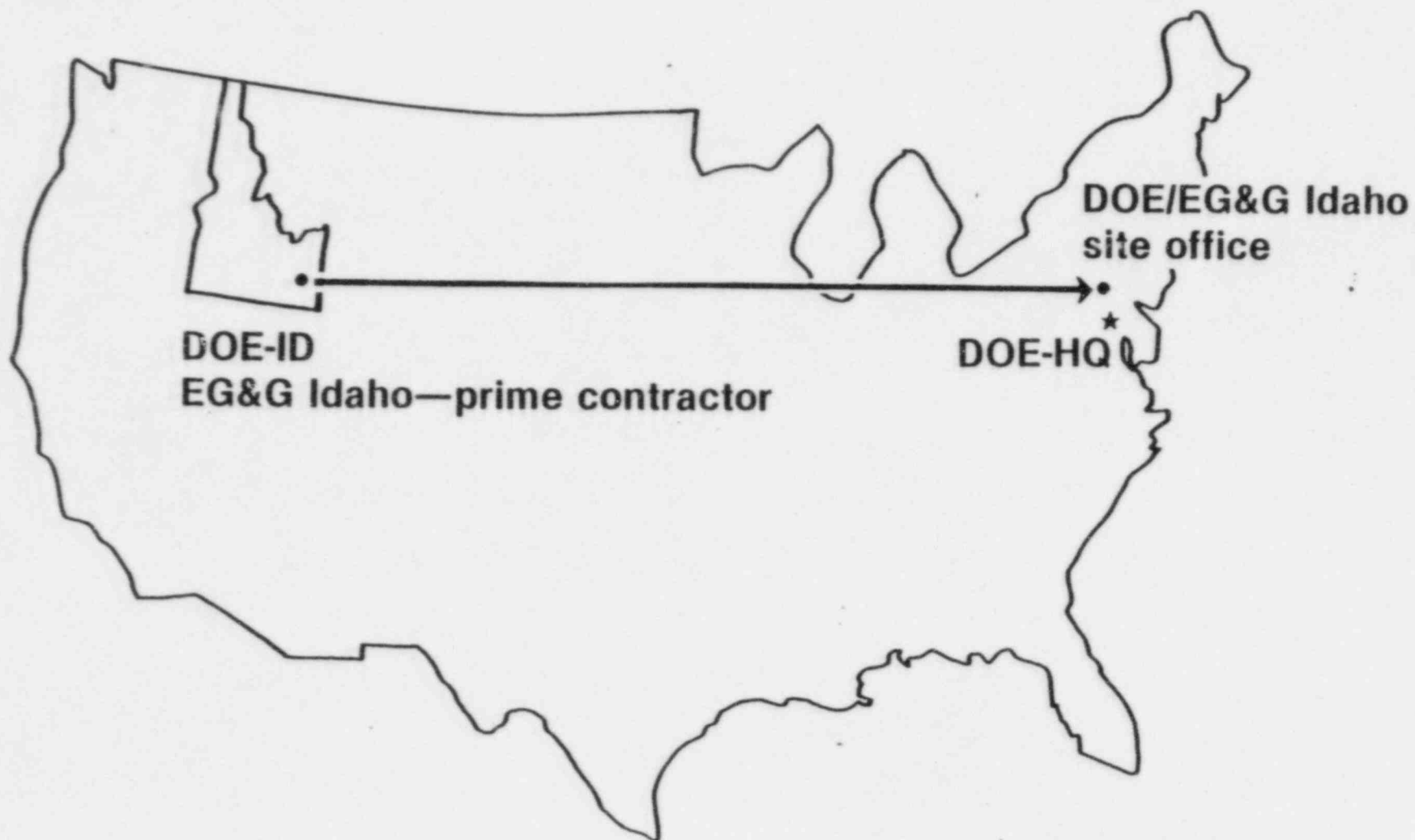
U.S. Department of Energy Research and Development Program

Willis W. Bixby
Manager

DOE TMI Site Office



DOE's Structure



DOE's TMI-2 Mission

**To obtain data to enhance reactor safety and
provide technology for recovery from
significant accidents - - such as TMI-2**

“...Data to Enhance Reactor Safety...”

Focused on:

- **Source term validation of fission product release and transport models**
- **Accident progression—how TMI-2 arrived at its final state**
- **Instrument and electrical performance—accident performance vs. actual design**

while . . .

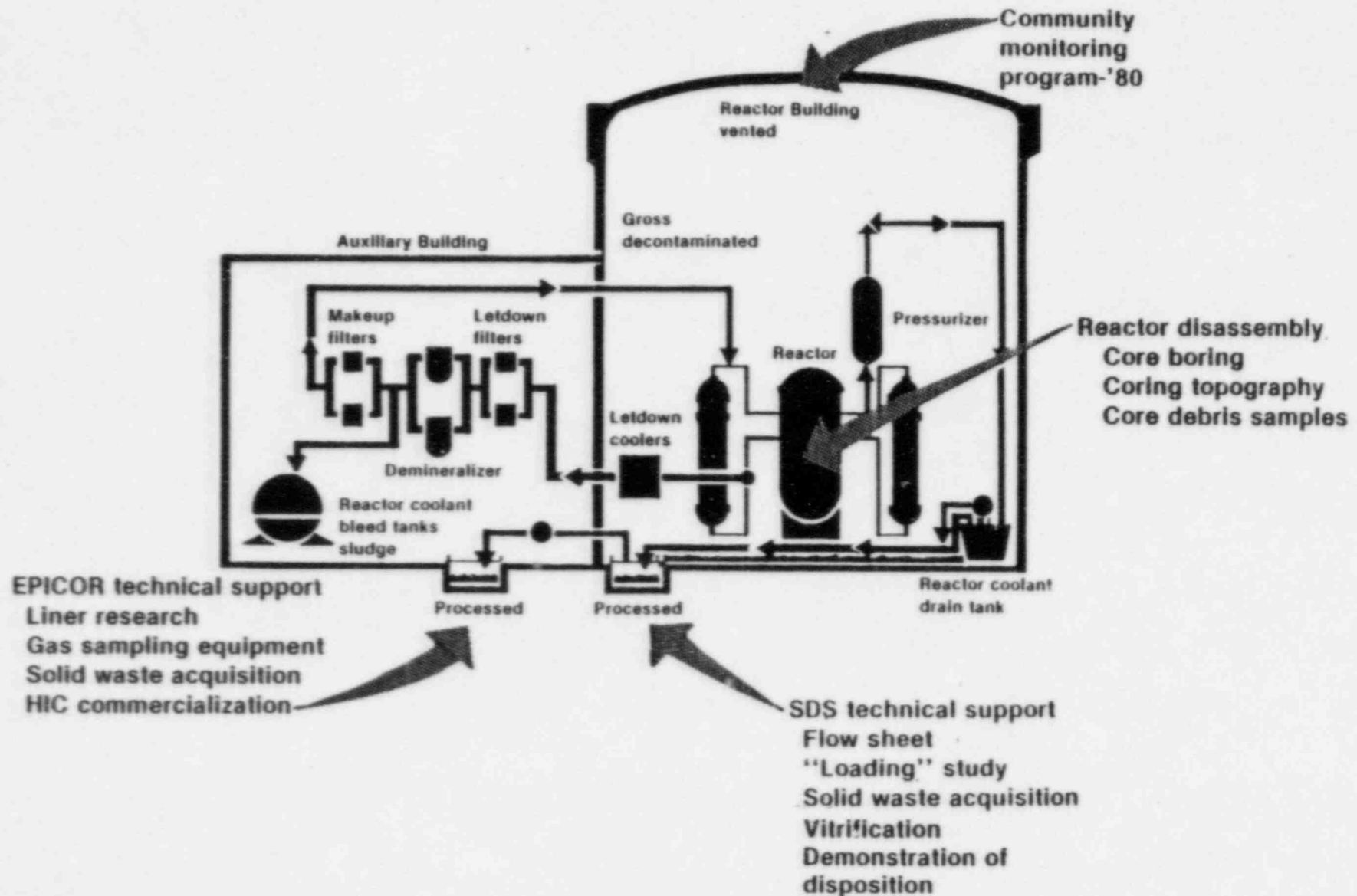
“...Technology for Recovery from Significant Accidents...”

Focused on:

- **Waste management**
- **Reactor disassembly**

DOE Provides Technical Support of Direct Benefit to Recovery

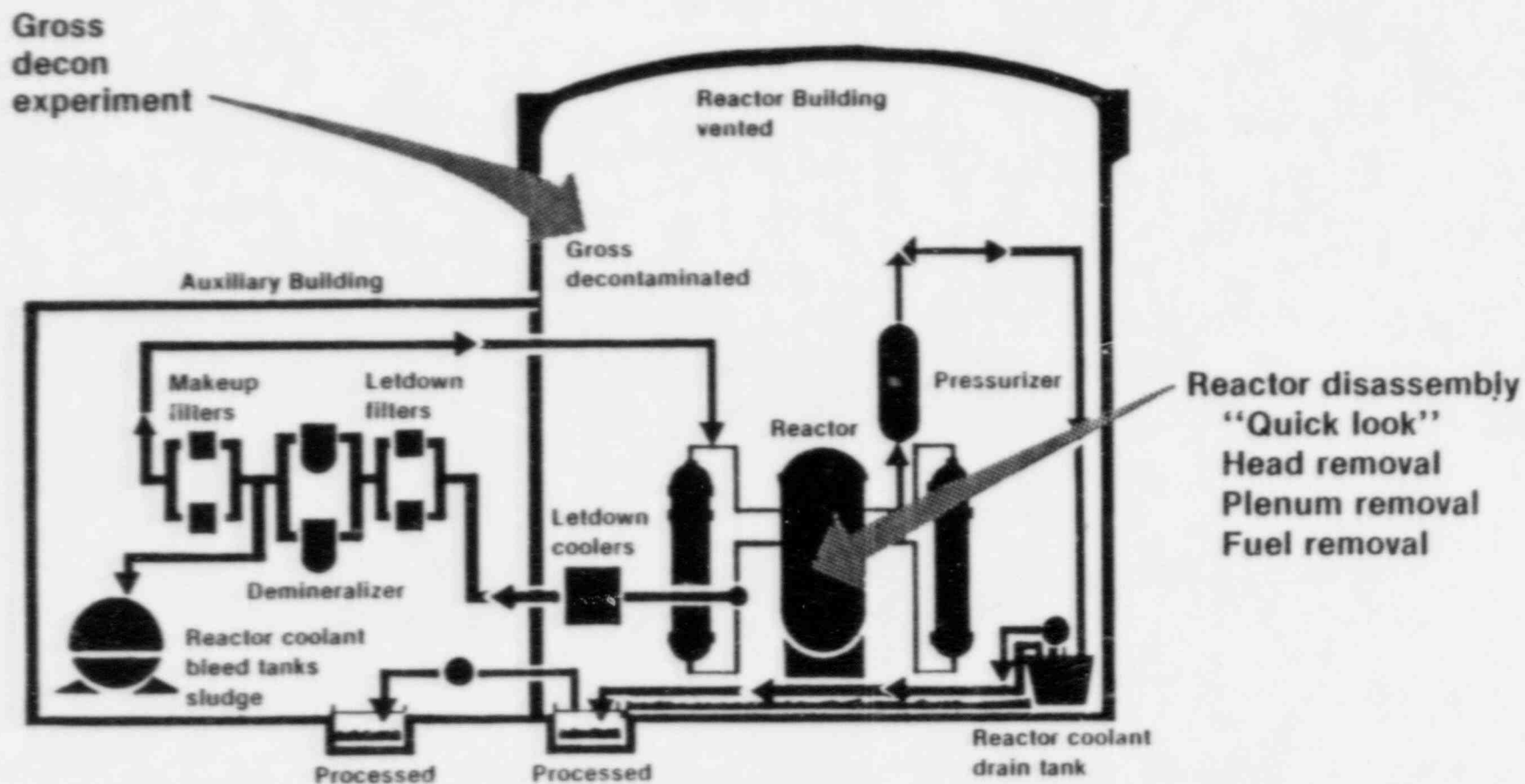
DOE's Technical Support in TMI-2 Recovery



DOE Funds Selected GPU Nuclear Activities of General Benefit to the Industry

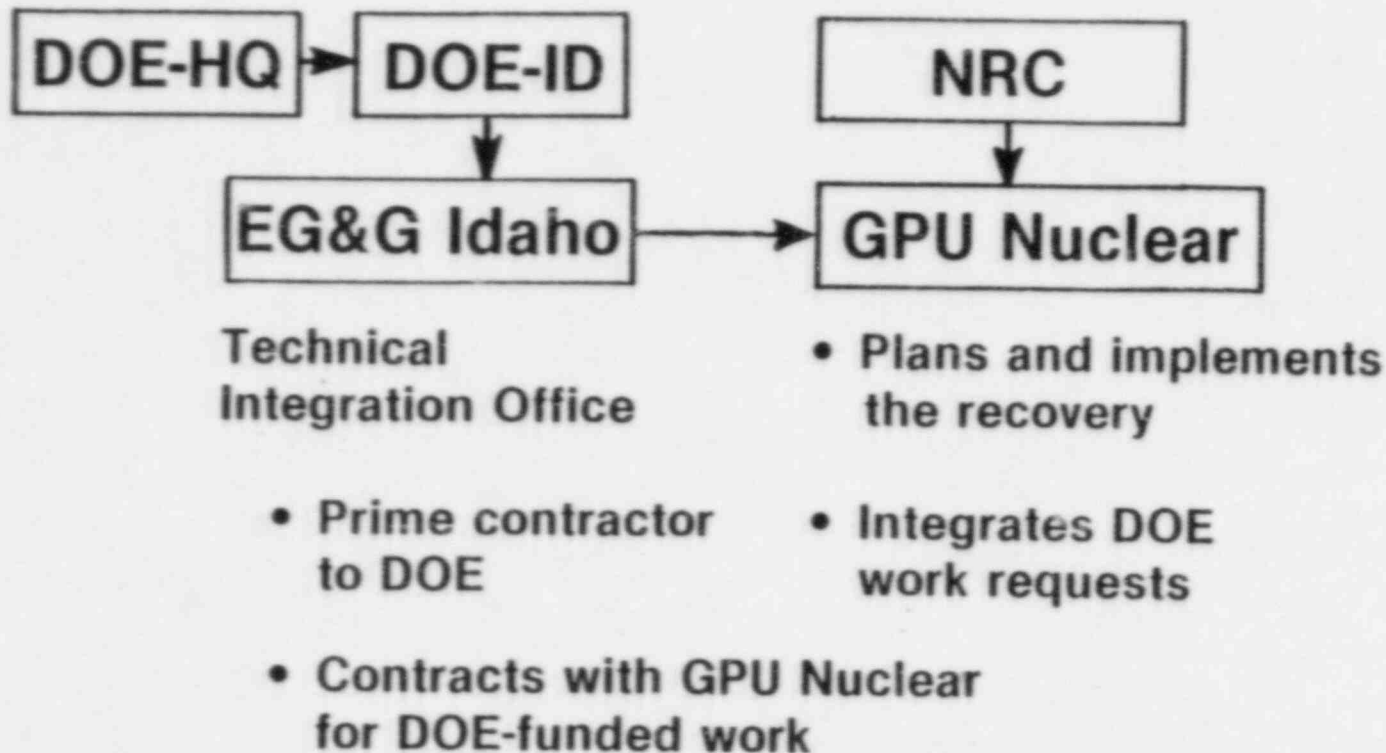
- Funding levels approximately \$12 million to \$15 million a year, depending on scope of work to be performed

DOE's Funding Support in TMI-2 Recovery





Unit 2 Organizational Relationships



Current Attention Focused on:

- **Start of fuel shipping by March 1986**
- **DOE/EG&G Idaho responsibility for procuring rail cask and arranging for fuel shipping**

DRAFT - 07/02/84

LONG-TERM ENVIRONMENTAL
RADIATION SURVEILLANCE PLAN
FOR
THREE MILE ISLAND
Update - July 1984

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FOREWORD

The U.S. Environmental Protection Agency has conducted an environmental monitoring and surveillance program in the vicinity of the damaged Three Mile Island Unit 2 reactor since March 30, 1979. Since April 13, 1979, EPA has been the lead Federal agency for TMI monitoring and public reassurance. The effort was started under the Office of Research and Development and reassigned to the Office of Radiation Programs beginning on October 1, 1981.

The Office of Radiation Programs, EPA, continues to provide appropriate monitoring and surveillance and to coordinate release of environmental data to the public during the decontamination of Unit 2. This involvement is expected to continue until the reactor core has been safely removed and shipped offsite.

This update of the long-term surveillance plan has been reviewed by and concurred in by the appropriate technical staffs of the Nuclear Regulatory Commission, U.S. Public Health Service (FDA, HHS), the U.S. Department of Energy, the Commonwealth of Pennsylvania and the State of Maryland.

Glen L. Sjoblom
Director
Office of Radiation Programs
U.S. Environmental Protection Agency

CONCURRENCES

This Surveillance Plan, an update to the plans published 27 September 1979, 17 March 1980 and 15 March 1981 has been jointly developed by the participating Federal and State agencies. The assigned technical staffs of these agencies have reviewed and concurred with this document.

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State of Maryland

INTRODUCTION

The U.S. Environmental Protection Agency was named by the White House as the lead Federal agency for conducting a comprehensive long-term environmental radiation surveillance program as followup to the March 28, 1979 accident at the Unit II reactor of the Three Mile Island nuclear generating station¹. Before implementing a formal long-term plan, on September 27, 1979 the Federal agencies followed the general plan outlined in the White House Memorandum, modifying it occasionally as required by the changing conditions at the reactor. The U.S. Environmental Protection Agency has coordinated the efforts of the involved Federal agencies, the Commonwealth of Pennsylvania, and the State of Maryland.

The public release of data obtained by the Federal agencies involved in the long-term monitoring program will be through the U.S. Environmental Protection Agency (EPA). However, data will be provided simultaneously to the other Federal participants and to the Bureau of Radiation Protection (BRP) of the Pennsylvania Department of Environmental Resources (DER). In no way will this preclude any agency from fulfilling its statutory responsibility.

The purposes of the long-term environmental radiation surveillance program include:

- (1) providing a measure of the radiological quality of the environment in the vicinity of the Three Mile Island nuclear power facility during a period when large quantities of radioactive material will be dealt with during the cleanup of the facility;

1. Memorandum dated April 13, 1979 from Jack Watson to Joseph Califano (DHEW), James Schlesinger (DOE), and Douglas Costle (EPA).

- (2) providing a basis for informing the public as to the environmental levels of radioactivity;
- (3) providing an in-place monitoring program ready for immediate use if an accidental release should occur.

This long-term surveillance program is not a substitute for, but is in addition to and independent of, the environmental surveillance program conducted by GPU Nuclear, operators of the nuclear power station.

The uncertainties of type and timing of cleanup operations resulting from both evolutionary nature of the overall process and from the various delays imposed by funding uncertainties and regulatory processes, as well as political/judicial interactions and the changing inventories and locations of radionuclides as cleanup progresses, necessitates periodic revision of any monitoring plan. This document is the third revision of the Long-Term Environmental Surveillance Plan for Three Mile Island dated Sept. 27, 1979. The first revision is dated March 17, 1980 and the second March 1981. The current revision was undertaken in 1983, placed in abeyance during the re-evaluation of EPA's long-term role at TMI and completed following discussions of monitoring needs at the Feb. 12, 1984 meeting of the NRC Citizens' Advisory Panel for the Decontamination of TMI Unit II.

In developing the original plan, careful consideration was given to the potential for environmental contamination and public risk associated with the types and quantities of radionuclides that were in the Reactor Containment Building, the Auxiliary Building and the Fuel Handling Building, and associated tanks and systems. The Licensee's surveillance plan, which is closely monitored by the Nuclear Regulatory Commission (NRC), was also considered. Subsequent revisions have made adjustments in the monitoring program as the situation changed.

A detailed description of the cleanup over the 5 years since the accident was published recently in 'Nuclear Safety'² and will not be repeated here. Data prepared by the Licensee³ indicates that 99.96% of the original 1.27×10^{10} curies of radioactivity present in the Unit II core at shutdown on March 28, 1979 has decayed away. Of the major long-lived fission products, significant portions have been removed from TMI by the various decontamination operations, mainly by the decontamination of Reactor Building sump water with the submerged demineralizer system - EIPCOR-II combination and the Auxiliary Building water with the EPICOR-II. The status of several isotopes responsible for most of the radiological hazard in the cleanup is as follows:

<u>Isotope</u>	<u>Original Core Inventory (Curies) Delayed to 1/1/84</u>	<u>% Shipped Off TMI</u>	<u>Activity Remaining (Curies)</u>
^{90}Sr	6.94×10^5	4.9	6.6×10^5
^{137}Cs	7.57×10^5	42.3	4.37×10^5
^{134}Cs	3.41×10^5	54.7	1.54×10^4

While high levels of radiation exist in a number of accident-contaminated areas in the Auxiliary and Fuel Handling Buildings as well as in the Reactor Building itself, especially in the sump/basement, the only compartment of radioactivity remaining at TMI II that has a significant potential for environmental contamination or public risk is the reactor core itself and the surrounding coolant system. Even the radioactivity in the latter has been significantly reduced by "bleed and feed" decontamination using the Submerged Demineralizer System (SDS).

2. Kalman, G. and R. Weller. 1984. Progress in the Recovery Operations at Three Mile Island, Unit 2. Nuclear Safety 25(1):88.

3. TMI 2 Technical Planning Dept., 1984, Data Report. Radioactive Waste Management Summary Review. TPO/TMI-043, Rev. 2, Jan. 1984.

Two isotopes which are much less hazardous than the foregoing, but which have received disproportionate public attention, are krypton-85 and tritium. Approximately 25-35,000 curies of krypton-85 are estimated to remain in the core; but, since the fuel cladding, which contains evolved fission gases in intact rods, is already mostly disrupted, it is improbable that any large pockets of free krypton gas remain and any release will be small and gradual. About 20% of the estimated 2900-3500 curies of tritium remaining is believed to be in the reactor core. Most of the remainder, about 2,000 curies, is contained in the 1.6 million gallons of processed water being stored on TMI pending decision on its disposal.⁴ Some of the processed water is used in ongoing decontamination work and then processed through the SDS again.

Pursuant to the February 12 presentations and discussions of TMI monitoring before the NRC Citizens' Advisory Panel on the Decontamination of TMI Unit II, representatives of EPA, NRC, PA-DER (Bureau of Radiation Protection), and GPU Nuclear met on March 20, 1984 to review existing environmental monitoring at TMI vis a vis the current situation and the projected cleanup schedule.⁵ It was concluded that EPA's monitoring program, which has been mostly configured to early detection of levels of radioactivity approaching Regulatory Limits, should be redirected to permit detection of radioactivity at/near ambient levels while retaining the ability to resume an "emergency" configuration on short notice. Several alternatives were considered including putting parts of the monitoring network on "standby." The revised program presented herein retains essentially all existing types of monitoring at all existing locations but substantially reduces the volume of analytical effort by sampling for longer periods of time and utilizing analysis of composites

4. No releases are permitted without NRC approval.

5. Representatives of contractors (Dr. Ruth Patrick et al.) evaluating TMI monitoring programs, under auspices of the TMI Public Health Fund, were invited to attend but did not do so because the Contract was not in effect when the meeting was held.

where feasible. Substantial gains in sensitivity were achieved both by using larger samples and counting the samples for longer times to improve detection and counting statistics. The ^{85}Kr samplers at York Haven and Middletown are being put in "standby" except when activities on the Island indicate potential for increased ^{85}Kr release. Two high volume air samplers were added (TMI Observation Center and Goldsboro) to provide large air particulate samples for radiochemical analysis and an additional tritium-in-air sampler added at Red Hill. Several adjustments are being made in the water monitoring program, in particular, reducing sample frequency at Lancaster and the wells sampled for groundwater analysis and, also, relocation of the upstream water sampling point from City Island to a point south of the Swatara Creek juncture with the Susquehanna.

The revised plan provides for increased surveillance if a release is anticipated, or if a release occurs unexpectedly. For example, increased ^{85}Kr monitoring will be provided during the head lift and, at least initially, during direct manipulation of the core while the pressure vessel is open.

ROUTINE SURVEILLANCE PROGRAMS

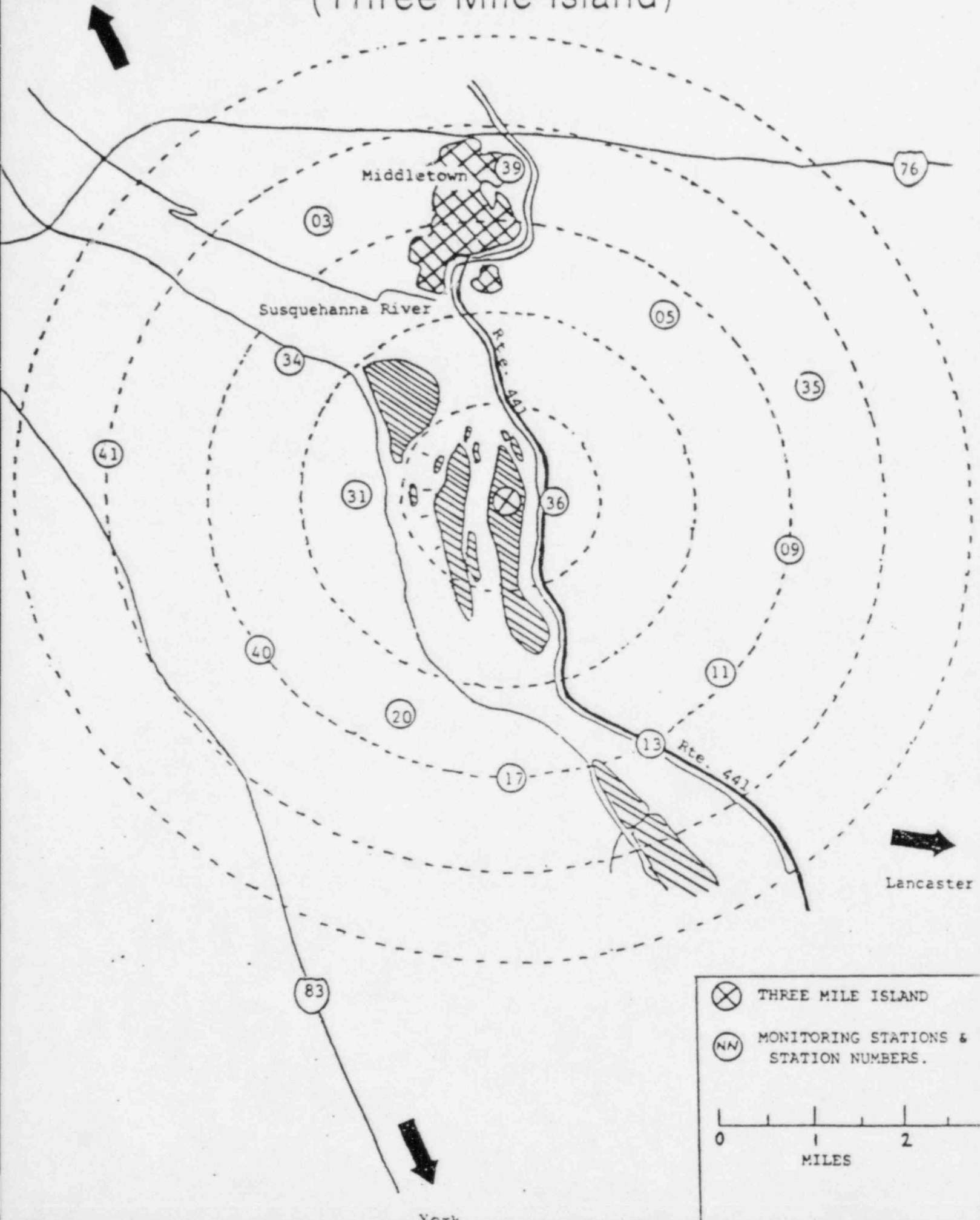
Federal Agencies

Environmental Protection Agency

EPA currently operates a network of 14 continuous air particulate and ambient gamma radiation monitoring stations (Fig. 1) at radial distances ranging from 0.5 to 3.5 miles from TMI. Each station includes a constant volume air sampler (Radeco Model 28A or B) and 13 have pressurized ionization chamber detectors (PIC's) with local strip chart recorders and data telemetry capability (Reuter-Stokes RS1011 "Sentri" System). A list of sampling locations is shown in Appendix A. EPA did not install a "Sentri" PIC unit at the Harrisburg International Airport

Long Term Air Monitoring (Three Mile Island)

Harrisburg



location because data are available from the GPUN "Sentri" unit a few hundred yards distant and because airport construction activities make long-term use of the current location uncertain. Additionally, high volume air samplers are operated at the TMI Observation Center and at Goldsboro.

The constant volume air samplers draw air at a rate of 2 cfm through a 2" diameter fiber glass filter and then through an activated charcoal cartridge. The filters collect atmospheric dust particles, including radioactive particles while the charcoal cartridges retain radioiodine and, to some extent, xenon. The filters and charcoal cartridges are changed at least weekly. At various times during the accident and post-accident period, changeout has been daily or every 2 days. Current changeout is weekly. Samples are analyzed by gamma spectroscopy at the TMI Field Station in Middletown using a GeLi or Intrinsic Ge detector. The lower limit of detection (LLD) varies principally with the detector analyzer system used, the isotope of interest, counting geometry and counting times. For example, the LLD for a 10-minute count on an air filter using the GeLi detector is approximately 25 pCi for ^{131}I or ^{137}Cs . A more complete listing of LLD's for various isotopes of interest and counting geometries is given in Appendix B.

The minimum detectable concentration (MDC) of an isotope in a sample is determined basically by dividing the LLD for that isotope and counting geometry with the sample volume. Using the previous example of ^{137}Cs with an LLD of 25 pCi and 80 m^3/day air volume, the MDC for ^{137}Cs in a 48-hour sample would be 0.16 pCi/m^3 and the MDC for a 168-hour sample would be 0.04 pCi/m^3 . In practice, LLD's and MDC's may be affected adversely⁶ to considerable extent by many things including:

6. In the sense that all of these factors reduce the precision of the determination and thereby make it more difficult to reliably sample and quantify very small quantities or concentrations of an isotope.

sampling variability, complexity of precounting preparations and attainable degree of uniformity thereof; counting interference from other isotopes present; representativeness of each sample, etc.

The high volume air samplers draw air through a 4" diameter polyester filter at the rate of approximately 32 cfm. Filters are changed out twice weekly. Analysis is done using procedures of the EPA's Environmental Radiation Ambient Monitoring System⁷ (ERAMS). Field estimates of beta radioactivity are made using a GM survey meter at 5 hours and 29 hours after collection to allow for radon and thoron daughter decay. The filters are sent to the Eastern Environmental Radiation Facility, Montgomery, Alabama for more sensitive analysis in a low background beta counter. Gamma scans are performed on filters showing a laboratory gross beta count greater than 1 pCi/m³. On a quarterly basis, the collected filters are composited and analyzed for plutonium and uranium. After chemical separation, the coprecipitated uranium and plutonium are analyzed for specific isotopes by alpha spectroscopy. Concentration of plutonium -238, -239, and uranium -234, -235, and -238 are reported. The LLD and MDC for the plutonium and uranium isotopes are 0.015 pCi/sample and 0.1 aCi/m³,⁸ respectively (sample volume 25,000 - 40,000 m³).

Thermoluminescent dosimeters (TLD's) are placed at each monitoring station as well as at a representative number of population centers surrounding TMI. Locations are shown in Appendix C. These dosimeters are changed quarterly and are read at the Office of Radiation Programs Facility in Las Vegas.

7. The ERAMS provides nationwide monitoring for ambient radioactivity in air and water. Detailed description can be found in the Environmental Radiation Data reports issued by EPA's Office of Radiation Programs.

8. aCi = attocurie = 10^{-18} Ci = 10^{-6} pCi.

Compressed air samples are collected at the TMI Observation Center, Goldsboro, Middletown and York Haven and analyzed for ^{85}Kr at the TMI Field Station. The collection period is controllable over a period from 1 day to 2 weeks depending on expected plant releases. A 2-week collection period has been in use since Fall 1981. With the adoption of this revision of the monitoring plan, sampling frequency and location will be varied, with the potential of ^{85}Kr release, as follows:

- | | | |
|--|---|---|
| Routinely | - | TMI Observation Station and Goldsboro. Operate continuously with 2-week collection period.

Middletown and York Haven - on standby. |
| Times when release is more likely ⁹ | - | All 4 locations with weekly collection period. |

Atmospheric moisture is collected by drawing air through molecular sieve collectors at the TMI Observation Center, Goldsboro, Middletown, Red Hill and Wernersville. The moisture is separated from the collector in the laboratory and analyzed for tritium content. Sampling is continuous with a weekly collection period.

EPA's water monitoring program at TMI is conducted in cooperation with the Pennsylvania Department of Environmental Resources, Bureau of Radiation Protection and Bureau of Water Quality Management. The monitoring program for discharges from TMI and for the Susquehanna River below TMI is designed to: (1) provide an early warning system to notify downstream water supplies and other water users should any high-level radioactive discharges occur; (2) provide an historical account of the radiological quality of discharges from TMI and of the

9. Such as during head removal and 2 weeks after and during fuel removal until proven unnecessary.

river to show what, if any, concentrations of radioactivity exist; (3) serve as an independent backup to the GPU Nuclear monitoring program and (4) provide some degree of public confidence in any decisions that are made concerning any discharges. Standard analytic procedures include gamma spectroscopy at the TMI Field Station (EPA); gross alpha, gross beta and tritium analysis by PA-DER or TMI Field Station, and ^{89}Sr and ^{90}Sr at EPA, Eastern Environmental Radiation Facility (ORP), Montgomery, Alabama. The LLD's and MDC's for water samples vary with count time and isotope and are given in Appendix B. Samples are usually analyzed for gamma radioactivity to a level of 10 picocuries per liter (100 minute count). Sampling locations and techniques are as follows:

(1) TMI Industrial Water Outfall -

- (a) Continuous (real time) monitor of gamma radioactivity with a flow through monitor. Output of monitor to recorders on-site and at the TMI Field Station Office. This monitor is equipped with an automatic telephone dialer which can be used as an alert mechanism to avoid contamination of downstream drinking water supplies. When in use, this system provides automatic notification to EPA and DER if the gamma radioactivity levels in the discharge exceed the equivalent of 1,000 pCi/l of ^{137}Cs . The automatic dialer is in standby at the present time to be reactivated if and when a substantial volume of water contaminated with high levels of gamma emitters again exists on TMI or when an emergency situation with potential for waterborne release develops. Since the completion of decontamination of the containment water in 1983 and substantial reduction of activity in the RCS reactor coolant processing through the submerged demineralizer system, there has not been a realistic potential for release of more than trace amounts of gamma radioactivity in water at TMI. The automatic dialer will be reactivated if such a threat occurs. All other features of the system remain operative.

- (b) Continuous sample collector collects up to 4 consecutive 24-hour samples. The output from this collector is directed to a separate collecting vessel whenever an alarm condition exists on the online monitor.
- (2) Weekly grab samples are collected by DER/WQM personnel at City Island, Harrisburg for background data. The sample is delivered to the DER laboratory at the Evangelical Press Building and picked up by EPA personnel for gamma analysis. To avoid sample loss due to the river being iced over and to account for several potential sources of radioactivity entering the river between City Island and TMI, the location of this background sample will be changed, prior to the Fall 1984 freeze-up to the Steelton Waterworks or another location downriver from Harrisburg and upriver of plant water intake.
- (3) The City of Lancaster's water inlet on the Susquehanna River is sampled every 2 hours and composited weekly. This sample is taken by City of Lancaster personnel and transported to the DER laboratory where it is picked up by EPA personnel for gamma analysis at the TMI Field Station. It is returned to DER by EPA personnel for additional analysis by the DER laboratory.
- (4) EPA personnel collect quarterly grab samples from wells at 5 locations near the Susquehanna River.
- (5) Weekly grab samples are taken from the TMI East Dike runoff basin whenever possible. On occasion the pond is frozen solid and samples would not be useful. More frequent samples are taken when the pond is overflowing into the river.
- (6) A monthly composite precipitation sample is taken at the Field Station Office.

Analysis for gamma radioactivity, gross alpha, gross beta and tritium are done on individual samples. Strontium analysis is done on composite samples made up of a week's daily samples (TMI outfall); a month's weekly samples (Lancaster, City Island, East Dike); or quarterly for the monthly or quarterly samples.

A summary of EPA's monitoring program is given in Appendix D.

Department of Energy

The Department of Energy (DOE) accident response capabilities for aerial radiological survey and meteorological modeling support are available as required. The DOE will also provide for selected soil and vegetation analysis and in situ gamma spectroscopy as may be requested by EPA or the Commonwealth of Pennsylvania.

Nuclear Regulatory Commission

The Nuclear Regulatory Commission (NRC) operates one air sampling station located on site, within the owner controlled area. The air sample is changed weekly and analyzed by gamma spectroscopy by EPA. NRC places 2 sets of TLD's at 67 locations as shown in Appendix E. Each set contains 2 lithium borate and 2 calcium sulphate phosphors. Both sets are read on a quarterly basis; however, flexibility exists to read 1 set at more frequent intervals should conditions warrant. The NRC reviews the GPU Nuclear's monthly liquid and gaseous effluent release reports and quarterly groundwater reports. The NRC periodically conducts Quality Control inspections and splits samples with contractor laboratories that analyze samples for GPUN.

U.S. Public Health Service

The U.S. Public Health Service (PHS), Food and Drug Administration (FDA) will defer further monitoring of foodstuffs and milk in favor of a close following of the Commonwealth of Pennsylvania's Department of Environmental Resources (DER) routine surveillance program. FDA may, at its option, split appropriate samples with the Commonwealth for confirmation. PHS/FDA will, however, be prepared to reinstitute and/or upgrade its former foodstuffs and milk sampling program in the event of an unexpected release from TMI.

State AgenciesCommonwealth of Pennsylvania

The Department of Environmental Resources of the Commonwealth of Pennsylvania operates three continuous air sampling stations: one at the Evangelical Press Building in Harrisburg, one at the TMI Observation Center, and one in Goldsboro. Each air sample consists of a particulate filter followed by a charcoal cartridge. The samples are exchanged weekly. The particulate air samples are beta counted for reactor related radionuclides. The cartridge is gamma scanned for radioiodine. Quarterly composites of particulate filters are gamma scanned, and assayed for radiostrontium.

The Commonwealth's milk sampling has reverted to its routine surveillance program which consists of monthly sampling at two dairy farms near the site. The milk samples are gamma scanned for all reactor related gamma emitting radionuclides.

The Commonwealth has placed TLD's at 10 locations which are cycled monthly and 8 which are cycled quarterly (see Appendix F).

As part of a routine QA/QC program with the Licensee, the Commonwealth also collects local produce, silt, and fish in season. These samples are analyzed by gamma spectroscopy for any reactor related radionuclides.

In addition to the water program conducted cooperatively with EPA, the Commonwealth collects monthly composite water samples at Steelton and York Haven. These composites are analyzed for gross activity, tritium and gamma emitters.

State of Maryland

The Maryland Department of Natural Resources is conducting a semiannual sampling of fish, shellfish, aquatic vegetation and sediments in the lower Susquehanna River and Upper Chesapeake Bay. Stations begin in Holtwood Reservoir and terminate below the mouth of the Sassafras River. The sampling strategy primarily is to detect the environmental distribution of radionuclide discharged during the normal operations of the Peach Bottom Atomic Generating Station. Knowledge of the levels of discharge from Peach Bottom and resulting environmental concentrations provides an empirical basis for the prediction of effects from Three Mile Island. The Holtwood Reservoir Station provides opportunity for detection of TMI effects prior to interference by Peach Bottom effluents, thus providing a basis for estimating the fractions of downstream detectable concentrations that are due to TMI.

In April 1982, the Maryland DNR expanded its aquatic surveillance of the Susquehanna River to include the placing of caged mussels and crayfish at Holtwood Reservoir and at Conowingo during the period of April 1 to December 1. The cages are pulled monthly and the biota analyzed for radioactivity. The program is intended to study uptake patterns by these animals, and the relative contributions from Three Mile Island and Peach Bottom to those uptakes.

In the Fall of 1983, Maryland DNR began a 3-year program designed to assess the chemical forms, mechanisms and removal rates affecting the fate of radionuclides in the Susquehanna River/Chesapeake Bay System. Specific tasks include defining the distribution of the radiocesium, radiocobalts, Zn-65, and Ag-110m among water, suspended matter and sediments, across the salinity gradient of the System. Also included is the determination of chemical forms and associations of these radionuclides in water and particulates. Another task is identifying the sorption/desorption kinetics associated with changes in physiochemical characteristics

of the System. The results of these studies and DNR's data base will provide the information necessary to model radionuclide fate in the Susquehanna River/Chesapeake Bay System. Semiannual sampling locations include Conowingo, Susquehanna Flats, Annapolis, and Calvert Cliffs.

In the event of an emergency, MD-DNR will duplicate the routine sampling at the anticipated time of maximum impact.

GPU NUCLEAR MONITORING PROGRAM

The GPU Nuclear Monitoring Program is a combination of the TMI-I and TMI-II Environmental Technical Specification required programs and increased monitoring activities which were initiated after March 28, 1979.

The monitoring program is subject to change based upon review of the results and requests for additional monitoring. In no instance will the program be reduced to less than that required by the Environmental Technical Specifications. All major reductions in scope or intensity will be discussed with the NRC and the Commonwealth of Pennsylvania prior to implementation. GPU Nuclear Environmental data are published annually in reports titled: Three Mile Island Nuclear Station Radiological Environmental Monitoring Report.

Appendix G describes the TMI Radiological Environmental Monitoring Program (REMP) locations and defines the types of samples collected at each station and Figures 2, 3, and 4 show the geographical location of sampling points. Appendix H describes by sample medium the collection frequency, analysis type and analysis frequency. In addition to the monitoring program defined herein, an extensive groundwater monitoring program and realtime gamma radiation monitoring system are also in operation.

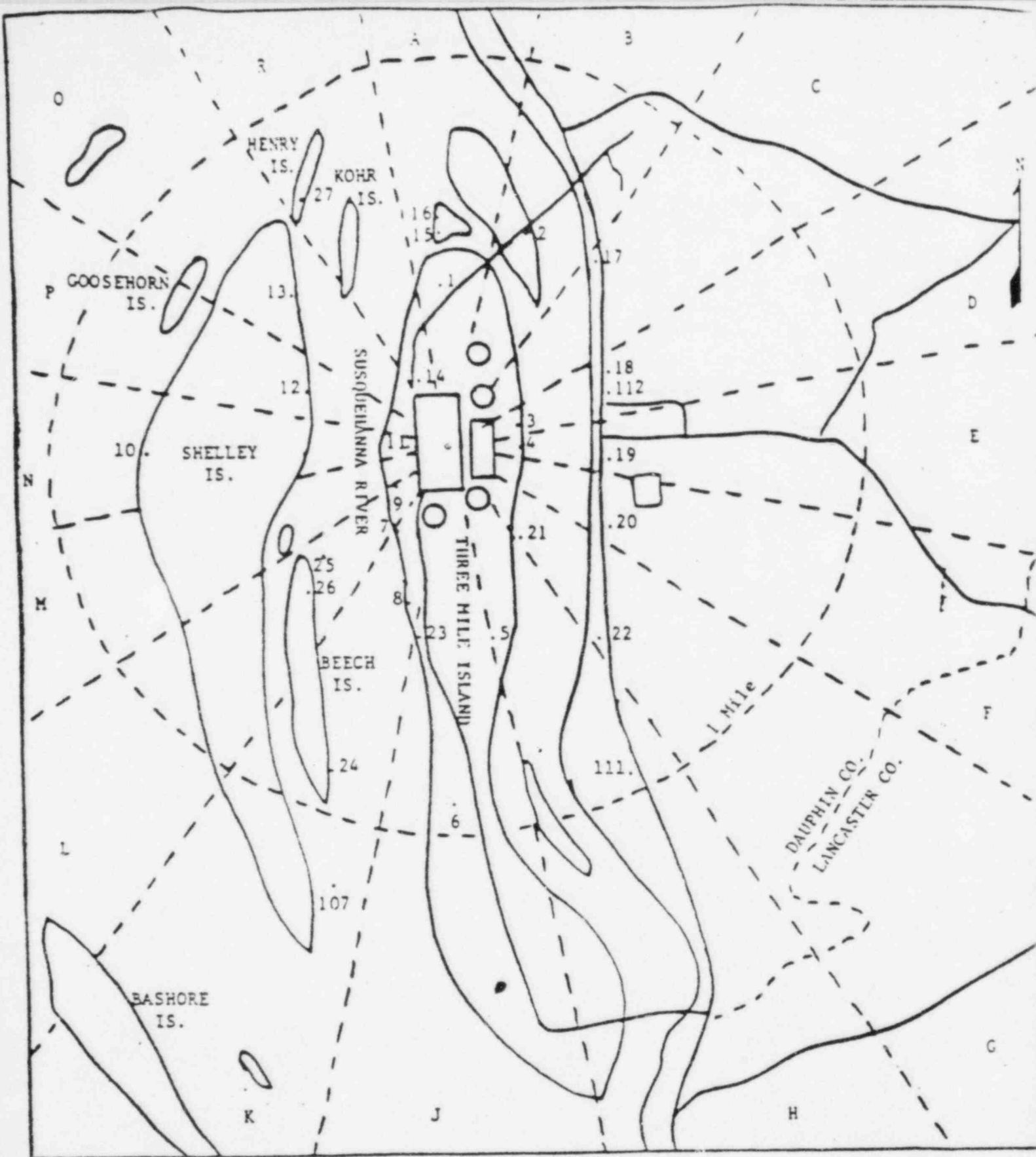


FIGURE 2

THREE MILE ISLAND NUCLEAR STATION
 LOCATIONS OF RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)
 STATIONS APPROXIMATELY 1 MILE FROM THE SITE

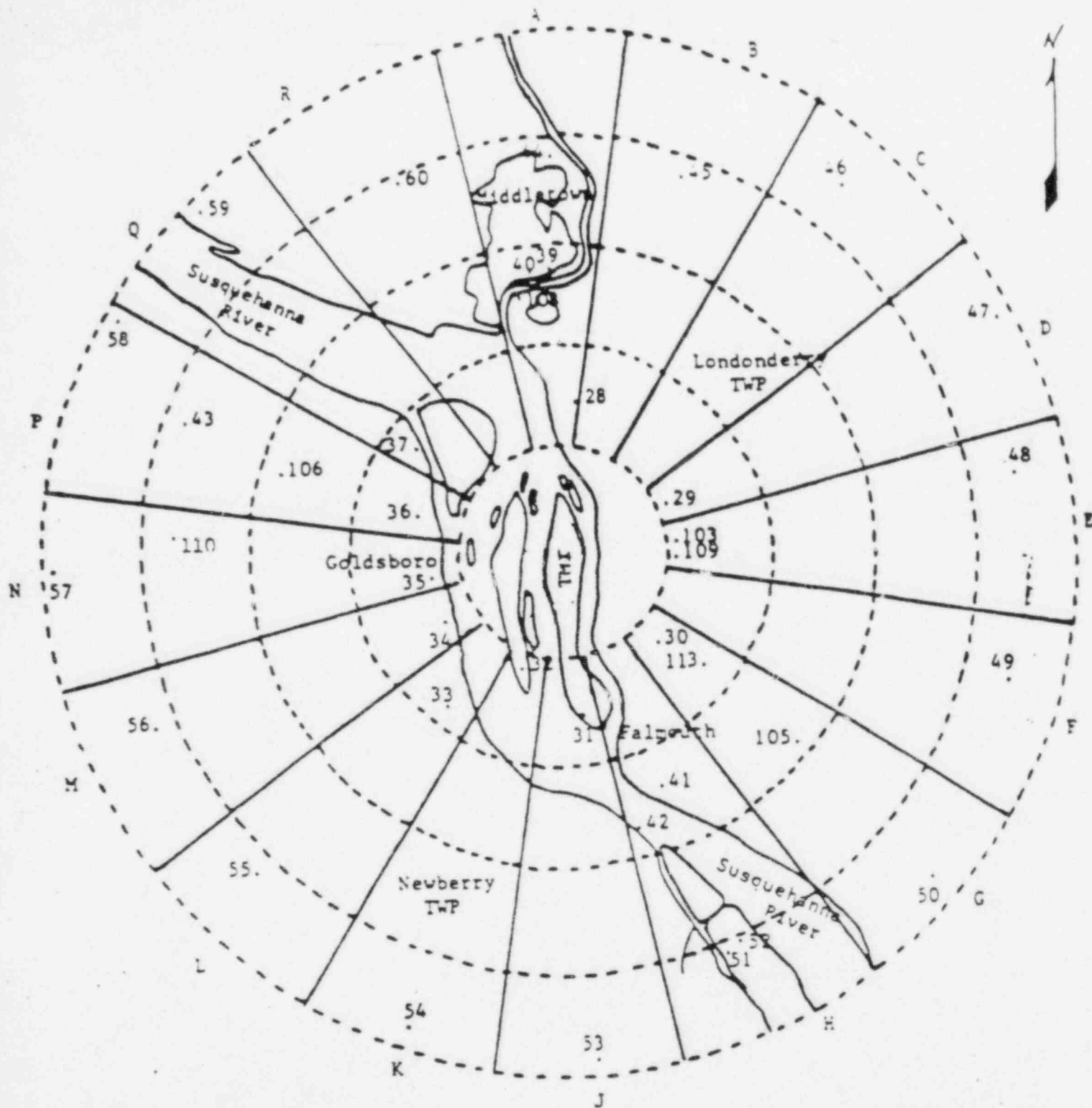


FIGURE 3

THREE MILE ISLAND NUCLEAR STATION
 LOCATIONS OF RADIOLOGICAL ENVIRONMENTAL MONITORING STATIONS
 WITHIN 5 MILES OF THE SITE

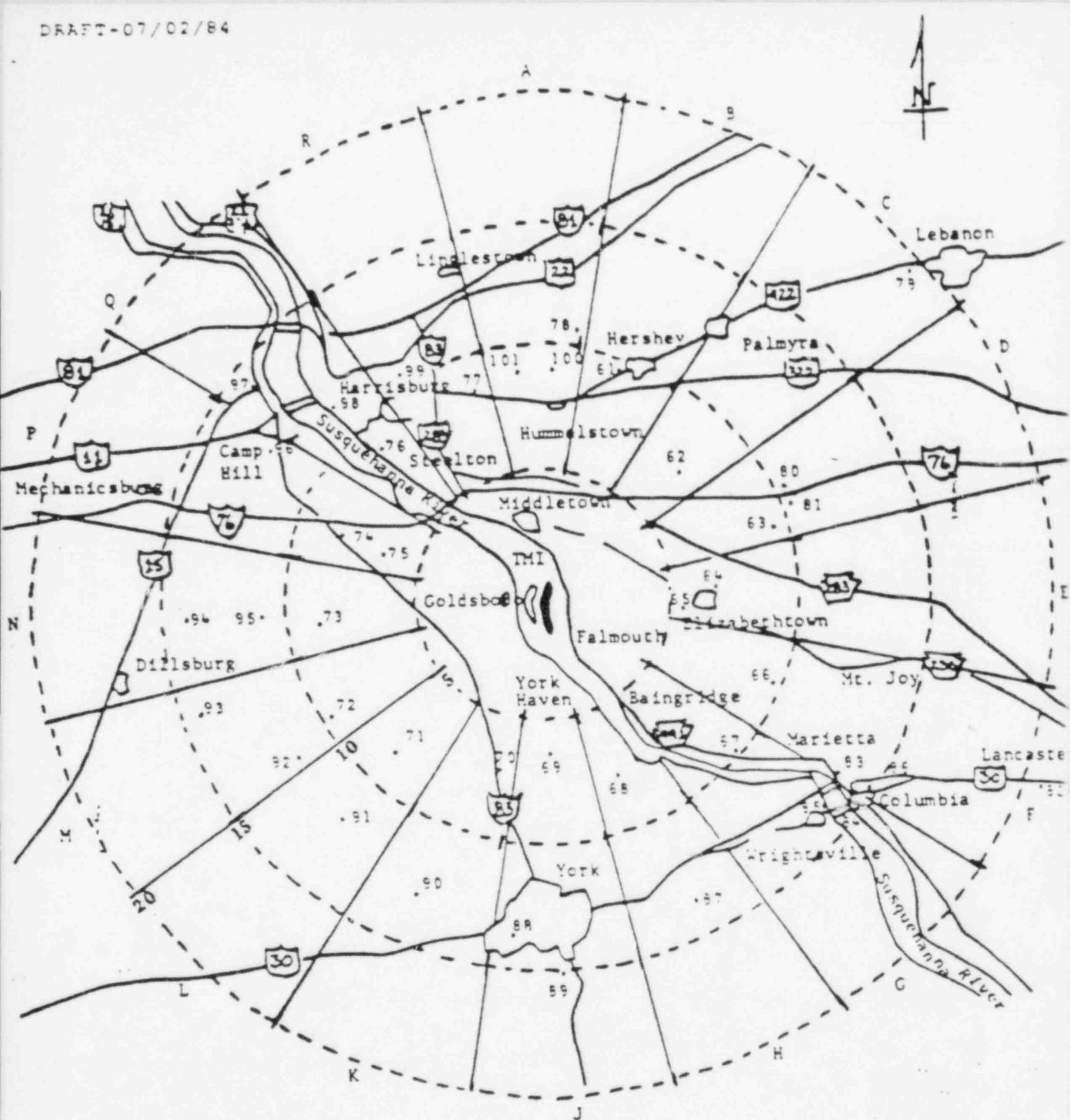


FIGURE 4

THREE MILE ISLAND NUCLEAR STATION
 LOCATIONS OF RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)
 STATIONS GREATER THAN 5 MILES FROM SITE

CONTINGENCY SURVEILLANCE PROCEDURES

Contingency planning for the protection of the public must address the possibilities of unplanned releases of airborne radioactivity to the general environment as well as waterborne releases in the Susquehanna River. The monitoring responsibilities of the Licensee and the Commonwealth in case of emergency are set forth in appropriate emergency plans including the PA-DER Plan for Nuclear Power Generating Incidents¹⁰; responsibilities of Federal agencies are generally stated in the Federal Radiological Emergency Response Plan (FRERP)¹¹; and EPA's broad responsibilities are stated in the EPA Radiological Emergency Response Plan.¹²

As a consequence of the 1979 Unit II accident, EPA conducts the previously described surveillance program which is expected to continue until Unit II is defueled and the fuel removed from TMI. The EPA procedures have been gradually modified from the initial accident oriented system put in place in March/April 1979 to a more or less routine surveillance program while retaining the capability to be rapidly changed back to the accident mode. This EPA activity is unique to TMI and, while not specifically included in the foregoing emergency plans, provides an initial Federal capability at the scene.

10. Plan for Nuclear Power Generating Stations, Rev 4A (1983) Bureau of Radiation Protection, Dept. of Environmental Resources, Commonwealth of Pennsylvania.

11. Federal Radiological Emergency Response Plan (FRERP). Publication for Public Review, Comment, and as the Basis for a Large Scale Field Exercise (FEMA). Federal Register Vol 49, Number 19, Jan 27, 1984, page 3578. Final version due Aug. 1984.

12. United States Environmental Protection Agency Radiological Emergency Response Plan, Office of Radiation Programs, U.S. Environmental Protection Agency Rept EPA 520/1-81-002.

If a Site-or General Emergency is declared by the Licensee or if a release of air- or waterborne radioactivity from either TMI Unit in excess of Technical Specifications is detected by plant monitors, the Director, EPA TMI Field Station will be notified by the EPA Emergency Response Coordinator through operation of FRERP notification procedures and, usually, directly by the Deputy Director, TMI Program Office, NRC. In consultation with the EPA Emergency Response Coordinator, the Director, TMI Field Station will determine to what extent increased/modified EPA monitoring is required pending arrival of other Federal response. The Deputy Director, TMIPO, NRC will ensure that the Director, EPA TMI Field Station has access to current release data and meteorological information.

EPA TMI Field Station Personnel may be deployed to collect additional samples or readings as well as to ensure that all monitoring equipment is operating properly. The need for and positioning of such samples or readings will be determined by the Director, TMI Field Station unless and until a more elaborate response occurs under the EPA Radiological Emergency Response Plan and/or the Federal Radiological Emergency Response Plan.

On-site NRC Health Physics personnel would be supported by NRC Regional and Headquarters personnel including the NRC Region I mobile laboratory. Additional NRC personnel would be on-site within 2 hours; the location of the mobile laboratory at the time of the occurrence would dictate its response time.

The Emergency Coordination Center of the DOE will be notified by the NRC and may be requested to provide aerial measurements and plume tracking. The response time for an aircraft to reach TMI can be expected to be from 2-3 hours under normal conditions with a 6-hour maximum under virtually any condition.

During certain in-plant cleanup operations where an increase in the rate of gaseous releases to the environment may be expected, additional survey teams may be deployed to TMI by the EPA, the PHS, the NRC, and the PA-DER. The DOE helicopter may also be on standby in the Harrisburg area for such operations. (These critical points will be identified by the NRC as much in advance as possible.)

Air sampling will serve as a measurement of inhalation exposure as well as an indicator of potential contamination of milk and food crops. Should a prolonged airborne release occur, supplemental air monitoring stations may be established, and PHS/FDA foodstuff and milk sampling programs can be reinstituted. It is noted that both the licensee and the Commonwealth have milk sampling programs routinely in effect and that EPA has capability at TMI Field Station to analyze milk for radioactivity if needed.

The contingency plan for release of contaminated water above the Licensee's permitted level for discharge to Susquehanna River includes prompt confirmation of the released activity by analyses of grab and composite samples as previously noted followed by notification of the impact to downstream users. If release of radioactive material to the river in excess of Technical Specifications is indicated by any means, the Director, EPA TMI Field Station will contact the designated PA-DER representatives (BRP, BWQM) to activate confirmation and notification procedures. He will also notify the NRC and GPU Nuclear and request examination of in-plant monitors (RML-7) for confirmation and appropriate action if necessary. The Bureau of Radiation Protection will evaluate the significance of the discharge based on available data including analyses of the "grab" samples, and in consultation with the Bureau of Water Quality Management and EPA, determine whether downstream water will be impacted.

In addition to the notification procedures of appropriate Pennsylvania agencies, the Director, EPA TMI Field Station will notify EPA's Region III Office and EPA's Office of Radiation Programs of the details of the release including anticipated impact to the adjoining states. EPA's Region III Office will then be responsible for notifying adjoining states. This plan does not alter the NRC standard operating procedures for notification of the EPA Regional Office.

The Maryland State Department of Health and Mental Hygiene Office of Environmental Programs will provide additional monitoring capability as appropriate. Water samples will be taken at all Maryland drinking water intakes from the Susquehanna River. These intakes are:

1. Baltimore Big Inch Intake - located immediately above Conowingo Dam;
2. Conowingo Intake;
3. Bainbridge, Md. - Port Deposit Intake;
4. Perry Point Veterans' Hospital;
5. City of Havre de Grace.

Milk samples will be taken at farms in Pennsylvania which are operating under Maryland Department of Health and Mental Hygiene permits.

A list of telephone numbers of individuals responsible for the various monitoring programs at TMI is shown in Appendix I.

REPORTING PROCEDURES

There will be two types of data reporting procedures. The first type is designed to distribute information upon which immediate action might be taken and consists of informal reporting methods, while the second procedure is designed to provide a verified data base and formal reports.

Immediate Notification Procedures

Each of the monitoring agencies will inform the Director, EPA TMI Field Station (or his designated representative) of the identification of statistically significant levels¹³ offsite of radionuclides of potential reactor origin. If the reported levels are in excess of those commonly found in the environment as a consequence of weapons testing, the Director, TMI Field Station will relay the information promptly by telephone or in person to participating Federal Agencies, the Commonwealth of Pennsylvania, and the State of Maryland, followed in either case by written documentation of the event. If concentrations of radionuclides in excess of those permitted in the environment by 10CFR20, Appendix B, Table 2, Column 2, are found outside the controlled area, EPA shall be notified within 2 hours of discovery. Otherwise, notification shall be made by noon of the working day following discovery.

Entering Data Into Data Base

Pursuant to the April 13, 1979 White House memorandum, EPA has attempted to gather as much relevant environmental data as possible into a computer data base. In addition to results of EPA monitoring, data from FDA (PHS), NRC, DOE, the Commonwealth of Pennsylvania, State of Maryland, State of New Jersey, GPU Nuclear Corporation and several other organizations have been entered. Most Federal data was entered directly by the monitoring agency using procedures provided by EPA while other data were generally entered by EPA personnel working from data provided in a stipulated format. Since 1980 almost all data have been entered by EPA.

13. Defined as resulting from replicate analyses each yielding net count exceeding 4.66 times the standard deviation of counts obtained on blank samples analyzed in the same manner for the same radionuclide.

Reports

The EPA is the lead Federal agency responsible for distribution of environmental data to the media. All participants in this plan will keep each of the other participants advised in advance of pending news releases concerning TMI environmental matters. Releases will also be furnished to GPU Nuclear Corporation.

EPA has issued two listings of environmental data including all data collected and reported through December 31, 1979¹⁴ and plans to issue summary reports of data collected since the cutoff dates for those reports. Progress on these reports has been delayed by limited ADP resources in the Office of Radiation Programs.

EPA has issued regular reports of its ambient gamma radiation, air particulate, radioiodine, and radiokrypton findings in regular newsletters since April 1980. Additionally, letter reports of gamma spectroscopic analysis results for water samples have been made to the NRC and PA-DER. The NRC regularly includes the data from both EPA reports in the TMIPO weekly status reports.

The Commonwealth of Pennsylvania and GPU Nuclear issue their own annual reports of data developed in their monitoring programs. The Power Plant Siting Program, State of Maryland reports the results of their monitoring programs at three year intervals.

14. a. Bretthauer, E.W., et al. "Three Mile Island Nuclear Reactor Accident of March 1979 Environmental Radiation Data." A Report to the President's Commission on the Accident at Three Mile Island. 7 vols. U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Las Vegas, Nev. 89114. Sept. 7, 1979.

b. Same author and same title, Update, Dec. 31, 1979.

QUALITY ASSURANCE

In addition to the internal quality control activities practiced by the Federal agencies and the Commonwealth of Pennsylvania, organizations involved in TMI monitoring will participate in the intercomparison studies listed below. Samples will be prepared and distributed by the Quality Assurance Division of EPA's Environmental Monitoring Systems Laboratory - Las Vegas (EMSL-LV). The intercomparison samples are as follows. The schedule for their distribution is determined by EMSL-LV.

Milk

Four-liter milk cross check samples containing potassium-40, strontium-89, strontium-90, iodine-131, and cesium-137 will be distributed to PHS, EPA, NRC, the Commonwealth of Pennsylvania, and the State of Maryland.

Water

The following cross-check water samples will be distributed to PHS, EPA, NRC, the Commonwealth of Pennsylvania, and the State of Maryland.

Four-liter samples containing a mixture of photon emitting radionuclides (cobalt-60), ruthenium-106, cesium-134, cesium-137, chromium-51, and zinc-65).

Four-liter samples containing strontium-89 and strontium-90.

Four-liter samples containing iodine-131.

Fifty milliliter samples of tritiated water.

Each participating Agency laboratory is expected to carry out three independent determinations for each radionuclide included in a particular study and to report the results to EPA. Upon receipt of the reports of all participating laboratories, the data will be analyzed. The analysis includes a determination of the laboratory standard deviation,

calculations of the normalized range, normalized deviation, sample standard deviation, grand average of all laboratories and warning and control limits.

A report will be distributed by EPA to participating laboratories containing results of each intercomparison study. EPA will immediately notify any participating Agency laboratory if it is determined that the laboratory cross check results exceed the quality assurance deviation level for any given type of analysis.

APPENDIX A

THREE MILE ISLAND
EPA LONG-TERM SURVEILLANCE STATIONS
Air Samplers and "Sentri" Locations

<u>STATION</u>	<u>AZ</u>	<u>DISTANCE (MILES)</u>	<u>ASSOCIATED TOWN</u>
3*	325	3.5	Middletown, PA - Harrisburg International Airport
5	040	2.6	Royalton, PA - Londonderry Township Building
9	100	3.0	Newville, PA - Brooks Farm (Earl Nissley Residence)
11	130	2.9	Falmouth, PA - Charles Brooks Residence
13	150	3.0	Falmouth, PA - Richard Libhart Residence
17	180	3.0	York Haven, PA - Drivers and Mechanics Bank
20	205	2.5	Woodside, PA - Zane Reeser Residence
31	270	1.5	Goldsboro, PA - Goldsboro Fire Station
34	305	2.7	Plainfield, PA - Polites Residence
35	068	3.5	Royalton, PA - George Hershberger Residence
36	095	0.5	TMI Observation Center
39	356	2.8	Middletown, PA - EPA-TMI Field Station
40	236	3.0	Newberrytown, PA - Jacobs Farm
41	275	4.0	Yocumtown, PA - Newberrytown Water Company

* Uses "Sentri" data from GPU system.

Representative Detection Limits - Gamma Spectroscopic Analysis

EPA TMI Field Station

Isotope	Detector	Geometry	Units	600 Sec. 10 min.	Counting Time	
					6,000 Sec. 100 min.	50,000 Sec. 833 min.
^{131}I	GeLi	Air Filter	pCi	28	9	3
		Charcoal	pCi	25	8	3
		Water	pCi/l	50	15	6
	Intrinsic Ge	Water	pCi/l	20	6	2
^{137}Cs	GeLi	Air Filter	pCi	24	8	3
		Water	pCi/l	45	15	6
	Intrinsic Ge	Water	pCi/l	26	8	3
^{60}Co	GeLi	Air Filter	pCi	29	9	3
		Water	pCi/l	45	14	6
	Intrinsic Ge	Water	pCi/l	21	7	2
^{125}Sb	GeLi	Air Filter	pCi	55	17	6
		Water	pCi/l	50	15	6
^{103}Ru	GeLi	Air Filter	pCi	19	6	2
		Water	pCi/l	42	13	6
$^{95}\text{Zr/Nb}$	GeLi	Air Filter	pCi	41	13	5
		Water	pCi/l	86	27	3
^{134}Cs	GeLi	Air Filter	pCi	23	7	3
		Water	pCi/l	40	13	7
^{140}Ba	GeLi	Air Filter	pCi	27	9	3
		Water	pCi/l	43	14	6
^{54}Mn	GeLi	Water	pCi/l	55	17	6
^{65}Zn	GeLi	Water	pCi/l	70	23	11
^{59}Fe	GeLi	Water	pCi/l	94	30	10

APPENDIX C (1 of 2)

EPA TLD NETWORK

<u>STATION</u>	<u>AZ</u>	<u>DISTANCE (MILES)</u>	<u>ASSOCIATED TOWN</u>
001	290	6.2	Fishing Creek, PA - Robert Bean Gulf Station
002	320	5.2	Highspire, PA - Citizens Fire Co. #1
003	325	3.5	Middletown, PA - Harrisburg International Airport
004	360	3.0	Middletown, PA - Elwoods' Sunoco Station
005	040	2.6	Royalton, PA - Londonderry Township Building
009	100	3.0	Newville, PA - Brooks Farm (Earl Nissley Residence)
010	095	6.8	Elizabethtown, PA - K. Hoffer ARCO Service Station
011	130	2.9	Falmouth, PA - Charles Brooks Residence
013	150	3.0	Falmouth, PA - Dick Libhart Residence
014	145	5.3	Bainbridge, PA - Bainbridge Fire Company
015	155	6.6	Saginaw, PA - United Methodist Church
016	180	7.0	Manchester, PA - Manchester Fire Department
017	180	3.0	York Haven, PA - York Haven Fire Station
019	205	10.7	Strinestown, PA - Brenner's Mobile Service Station
020	205	2.5	Pleasant Grove, PA - Zane Reeser Residence
021	250	4.0	Newberrytown, PA - Exxon Kwick Service Station
025	360	7.0	Hummelstown, PA - Keefer's Exxon Service Station
026	025	10.0	Hershey, PA - Good's ARCO Service Station
030	180	13.0	York, PA - York Fire Station, Springetts #16
031	270	1.5	Goldsboro, PA - Dusty Miller Residence
034	305	2.7	Plainfield, PA - Polites Residence
035	068	3.5	Londonderry Township, PA - George Hershberger Residence

APPENDIX C (2 of 2)

<u>STATION</u>	<u>AZ</u>	<u>DISTANCE (MILES)</u>	<u>ASSOCIATED TOWN</u>
036	095	0.5	TMI Observation Center
039	329	5.3	Lower Swatara, PA
040	314	10.6	Steelton, PA
041	305	10.7	New Cumberland, PA - Capitol City Airport
042	174	4.9	Conewago Heights, PA
043+	236	3.0	Newberrytown, PA - Jacob's Farm
044+	275	4.0	Yocumtown, PA - Newberrytown Water Co.
011HSGBKG	110	31.0	Lancaster, PA - Visitors' Information Center
002HSGBKG	055	25.0	Lebanon, PA - John Deere Equipment Co.
003HSGBKG	275	31.0	Carlisle, PA - Myers EXXON Garage
004HSGBKG	180	25.0	Loganville, PA

TOTAL STATIONS _ 33

+ New Stations added

TLD's are changed out Quarterly

APPENDIX D

SUMMARY OF EPA TM1 SAMPLE ANALYSIS

Media	Type Sample	Location	Sampling Method	Collection Frequency	Preparation	Analysis	Location of Analysis
Air	Particulate (const. vol)	14 stations - 3-mile radius	Continuous-filter	Weekly	None	Gamma spec.	TM1
	MIVol	TM1 Obs. Ctr. Goldsboro	Continuous-filter	Twice weekly	None	Gross B/Gamma spec.	TM1/EERF
				Quarterly Composite	Ashing/Chem. Sep.	Alpha spec. for PU, U.	EERF
	Radiobromine	14 stations - 3-mile radius	Continuous-charcoal cart.	Weekly	None	Gamma spec.	TM1
	Radiocrypton	TM1 Obs. Ctr., Goldsboro, Middletown York Haven	Continuous-air compressor	2 weeks 1 week if needed	Cryogenic separation	Liquid Scintillation	TM1
	Tritium	TM1 Obs. Ctr., Goldsboro, Middletown Red Mill, Wernersville	Continuous-molecular sieve	Weekly	Vacuum-cold trap extraction	Liquid Scintillation	TM1
Water	Surface Water	Industrial Outfall West bank, TM1	Continuous-compositor	Daily	1. None 2. Distillation 3. Evaporation	Gamma spec. Liquid scintillation ^H Alpha/beta counter- ^H & ^S	TM1 PA-DER
				Weekly Composite	4. Chem. Sep.	Alpha/beta counter- ^H & ^S	PA-DER EERF
	Wells	East Dike Run-off Basin	Grab	Weekly Monthly Composite	Same as TM1 Outfall		
		City Island, Harrisburg	Grab	Weekly Monthly Composite	Same as TM1 Outfall		
		Lancaster Water Intake	Composited Grab samples	Weekly Monthly Composite	Same as TM1 Outfall		
		5 locations near river-at or downstream of plant location	Grab	Quarterly	Same as TM1 Outfall		
Waste	Ambient Gamma dose rate	13 locations (same as particulate & R1)	Reuter-Stokes "Sentry"	Realtime	None	1. Electronic by CPU 2. Manual readout of chart	TM1
	Cumulative ambient gamma dose	34 locations	TLD's (3 per loc.)	Quarterly	None-calibration of system	Victoreen TLD reader	ORP-LV

APPENDIX E

NRC ENVIRONMENTAL TLD LOCATIONS

<u>NRC Station</u>	<u>Location</u>	<u>NRC Station</u>	<u>Location</u>
1	95 ⁰ 5.9 mi.	35	299 ⁰ 6.3 mi.
2	101 ⁰ 3.9 mi.	36	267 ⁰ 1.2 mi.
3	109 ⁰ 2.7 mi.	37	256 ⁰ 1.4 mi.
4	163 ⁰ 1.8 mi.	38	225 ⁰ 1.9 mi.
5	161 ⁰ 2.2 mi.	39	200 ⁰ 2.1 mi.
6	150 ⁰ 1.0 mi.	40	204 ⁰ 2.5 mi.
7	136 ⁰ 0.6 mi.	41	253 ⁰ 3.9 mi.
8	83 ⁰ 0.4 mi.	42	259 ⁰ 7.3 mi.
9	60 ⁰ 0.5 mi.	43	268 ⁰ 5.8 mi.
10	1 ⁰ 1.7 mi.	44	263 ⁰ 4.7 mi.
11	25 ⁰ 0.9 mi.	45	175 ⁰ 3.2 mi.
12	46 ⁰ 2.8 mi.	46	172 ⁰ 3.0 mi.
13	19 ⁰ 5.2 mi.	47	177 ⁰ 5.7 mi.
14	358 ⁰ 2.5 mi.	48	182 ⁰ 9.0 mi.
15	357 ⁰ 2.7 mi.	49	210 ⁰ 8.2 mi.
16	0 ⁰ 3.1 mi.	50	214 ⁰ 9.6 mi.
17	351 ⁰ 4.1 mi.	51	185 ⁰ 12.6 mi.
18	349 ⁰ 3.5 mi.	52	133 ⁰ 9.0 mi.
19	343 ⁰ 3.2 mi.	53	145 ⁰ 4.9 mi.
20	318 ⁰ 5.0 mi.	54	144 ⁰ 4.6 mi.
21	348 ⁰ 1.3 mi.	55	206 ⁰ 0.9 mi.
22	17 ⁰ 3.1 mi.	56	230 ⁰ 0.5 mi.
23	64 ⁰ 3.8 mi.	57	293 ⁰ 0.4 mi.
24	44 ⁰ 3.6 mi.	58	335 ⁰ 0.5 mi.
25	47 ⁰ 7.6 mi.	59	317 ⁰ 1.2 mi.
26	0 ⁰ 5.1 mi.	60	On site
27	6 ⁰ 7.4 mi.	61	On site
28	0 ⁰ 9.3 mi.	62	On site
29	0 ⁰ 12.6 mi.	63	On site
30	312 ⁰ 13.8 mi.	64	On site
31	306 ⁰ 9.6 mi.	65	On site
32	297 ⁰ 7.4 mi.	66	On site
33	310 ⁰ 5.9 mi.	67	On site
34	267 ⁰ 5.8 mi.		

TLD's are changed out Quarterly

APPENDIX F

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES
THREE MILE ISLAND TLD LOCATIONS (Frequency: Monthly)

		<u>Azimuth and Distance from Reactor</u>	
<u>Location</u>		<u>AZIMUTH (Degrees)</u>	<u>DISTANCE (Miles)</u>
TOMT ₁	Middletown, Met Ed. Mill Street Substation	358	2.6
TOMT ₂	TMI Observation Building, Rte. 441 So.	90	0.5
TOMT ₃	Laughlin Residence, Elizabethtown, PA	86	6.6
TOMT ₄	Squire Residence, Bainbridge, PA	145	5.2
TOMT ₅	York Haven, PA Hydroelectric Plant	166	2.9
TOMT ₆	Newberrytown, PA Township Building	252	4.5
TOMT ₇	Falmouth Substation, Falmouth, PA	161	2.3
TOMT ₁₀	Goldsboro, PA Met Ed. Monitoring Station	254	1.3
TOMT ₁₁	Beaver Residence, Redlands Acres, Etters, PA	284	4.6
TOMT ₁₂	Highspire, PA Turnpike Commission Bldg.	321	5.4

THREE MILE ISLAND TLD LOCATIONS (Frequency: Quarterly)

TOQT ₁₃	Duke Street Pumping Station, Hummelstown, PA	7	7.9
TOQT ₁₄	Township Building, Hershey, PA	22	9.1
TOQT ₁₅	Maintenance Garage, Manchester, PA	178	7.0
TOQT ₁₆	Public Works Garage, York, PA	179	12.9
TOQT ₁₇	Fire Company, Strinestown, PA	204	4.8
TOQT ₁₈	Sewerage Treatment Plant, Mechanisburg, PA	284	16.4
TOQT ₁₉	Borough Building, Camp Hill, PA	299	12.0
TOQT ₂₀	Evangelical Press Bldg., Harrisburg, PA	312	11.9

THREE MILE ISLAND NUCLEAR STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM STATION LOCATIONS AND SAMPLE TYPE COLLECTED

Station Code	Sample Medium	Description	Map Designation	Distance (Miles)	Azimuth (Degrees)
Al-1	AP, AI, ID	N of site, North Weather Station	1	0.4	0
Al-4	ID	N of RB centerline on W. fence adjacent to N. Weather Station	-	0.4	2
		TMI			
B1-1	ID	NNE of site on light pole in middle of North Bridge	2	0.7	25
B1-2	ID	NNE of RB centerline at top of dike-TMI	-	0.4	26
B1-3	ID	NNE of RB centerline on W. Fence adjacent to S. end of N. bridge-TMI	-	0.5	15
			-	0.3	45
C1-2	ID	NE of RB centerline at top of dike-TMI	3	0.3	71
D1-1	ID	ENE of site on top of dike, east fence	4	0.2	95
E1-1	ID	E of site on top of dike, east fence	-	0.2	90
E1-4	ID	E of RB centerline at top of dike-TMI	-	0.2	102
FI-2	ID	ESE of RB centerline at top of dike midway within Interim Solid Waste Staging Facility-TMI	-		
			-	0.3	124
G1-3	ID	SE of RB centerline at top of dike-TMI	5	0.4	167
H1-1	ID	SSE of site	-	0.3	148
H1-9	ID	SSE of RB centerline at top of dike-TMI	6	0.8	184
J1-1	ID	S of site at south beach of TMI	-	0.3	185
J1-3	ID	S of RB centerline on wooden post by old S. Gate Guard Bldg-TMI	7	0.2	200
K1-1	EW	On site, RML-7 station discharge	8	0.4	195
K1-2	ID	SSW of site	-	0.2	208
K1-4	ID	SSW of RB centerline on fence behind Warehouse #2-TMI	-	0.2	202
K1-5	ID	SSW of RB centerline on fence behind Warehouse #3-TMI	9	0.1	221
L1-1	ID	SW of site, west of mechanical draft towers on dike	10	0.4	270
N1-1	ID	W of site on Shelley Island	11	0.1	270
N1-2A	SW	On site, station intake (Unit 1)	-	0.1	270
N1-3	ID	W of RB centerline on fence adjacent to screenhouse entrance gate-TMI	12	0.4	293
P1-1	ID	WNW of site on Shelley Island	13	0.5	317
Q1-1	ID	NW of site on Shelley Island	-	0.2	325
Q1-2	ID	NW of RB centerline on fence behind Warehouse #1-TMI	14	0.2	340
R1-1	ID	NNW of site at gate in fence on W side of TMI, North boat dock	15	0.7	1
A1-2	AQS	N of site at North tip of TMI	16	0.7	0
A1-3	AQS	N of site at north tip of TMI	17	0.6	35
C1-1	ID	NE of site on Route 441	18	0.5	65
D1-2	ID	ENE of site on Laurel Road			

THREE MILE ISLAND NUCLEAR STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM STATION LOCATIONS AND SAMPLE TYPE COLLECTED

Station Code	Sample Medium	Description	Map Designation	Distance (Miles)	Azimuth (Degrees)
E1-2	AP, AI, RW ID, CR, S	E of site on N side of Observation Center	19	0.4	90
F1-1	ID	ESE of site on light pole on Route 441	20	0.5	117
G1-1	AQS	SE of site	21	0.3	137
G1-2	ID	SE of site on Route 441	22	0.6	143
J1-2	SW,	S of site below discharge pipe	23	0.5	188
K1-3	AQS	SSW of site	24	0.8	202
L1-3	AQS	SW of site	25	0.5	225
L1-2	ID	SW of site on Beech Island	26	0.5	221
R1-2	ID	NNW of site on Henry Island	27	0.7	332
A2-1	MG, FPL	N of site, farm along Route 441	28	1.2	5
D2-1	M, FPL, S	ENE of site, farm on Gingrich Road	29	1.1	65
G2-1	M, FPL	SE of site, farm on the E side of Conewago Creek	30	1.6	130
J2-1	SW, AQS	S of site above York Haven Dam	31	1.5	182
K2-1	ID	SSW of site on S beach of Shelley Island	32	1.1	200
L2-1	ID	SW of site on Route 262	33	1.9	227
M2-1	AP, AI, ID, CR	WSW of site adjacent to Fishing Creek, Goldsboro Air Station	34	1.3	253
N2-1	ID,	W of site at Goldsboro Marina	35	1.2	262
P2-1	ID	WNW of site off of Old Goldsboro Pike	36	1.6	297
Q2-1	ID	NW of site on access road along river	37	1.8	310
A3-1	AP, AI, ID RW, CR	N of site at Middletown Substation	39	2.6	358
A3-2	SW	N of site at Swatara Creek	40	2.5	355
H3-1	AP, AI, RW ID, CR	SSE of site at Falmouth-Collins Substation	41	2.3	159
H3-2	SW	SSE of site, York Haven Hydro	42	2.3	165
P4-1	M, FPL	WNW of site at Fisher's farm on Valley Road	43	3.6	295
A5-1	ID	N of site on Vine Street exit from Route 283	44	4.3	3
B5-1	ID	NNE of site, School House Lane and Miller Road	45	4.8	18
C5-1	ID	NE of site on Kennedy Lane	46	4.5	42

THREE MILE ISLAND NUCLEAR STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM STATION LOCATIONS AND SAMPLE TYPE COLLECTED

Station Code	Sample Medium	Description	Map Designation	Distance (Miles)	Azimuth (Degrees)
D6-1	ID	ENE of site off of Beagle Road	47	5.2	65
E5-1	ID	E of site, North Market Street and Zeager Road	48	4.6	81
F5-1	ID	ESE of site on Amosite Road	49	4.7	107
G5-1	ID	SE of site, Bainbridge and Riaser Roads	50	4.8	131
H5-2	SW	SSE of site on Brunner Island	51	4.1	160
H5-1	ID	SSE of site at Guard Shack on Brunner Island	52	4.1	157
J5-1	ID	S of site on Canal Road, Conewago Heights	53	4.9	182
K5-1	ID	SSW of site on Conewago Creek Road, Strinestown	54	5.0	200
L5-1	ID	SW of site, Stevens and Wilson Roads	55	4.1	228
M5-1	ID	WSW of site, Lewisberry and Roxberry Roads, Newberrytown	56	4.3	249
N5-1	ID	W of site, off of Old York Road on Robin Hood Drive	57	4.9	268
P5-1	ID	WNW of site, Route 262 and Beinhower Road	58	4.9	281
Q5-1	ID	NW of site on Lumber Street, Highspire	59	5.0	318
R5-1	ID	NNW of site, Spring Garden Drive and Route 441	60	4.9	339
B10-1	ID	NNW of site, West Areba Avenue and Mill Street, Hershey	61	9.4	21
C8-1	ID	NE of site, Shenks Church on School House Road	62	7.2	48
D9-1	ID	ENE of site on Mt Gretna Road, Bellaire	63	8.5	72
E7-1	ID	E of site on Hummelstown Street, Elizabethtown	64	6.8	86
E6-1	FPF	E of site, orchard at Masonic Homes	65	5.9	100
F10-1	ID	ESE of site, Donegal Springs Road, Donegal Springs	66	9.4	112
G10-1	AP, AI, RW	SE of site at farm off Engle's Tollgate Road	67	9.8	127
	ID, S				
H8-1	ID	SSE of site on Saginaw Road, Starview	68	7.4	163
J7-1	ID	S of site on Maple Street, Manchester	69	6.5	177
K8-1	ID	SSW of site, Coppenhaffer Road and Rt 295, Zion's View	70	7.4	196
L8-1	ID	SW of site on Rohler's Church Rd, Andersontown	71	8.0	225
M9-1	ID	WSW of site on Alpine Road, Maytown	72	8.6	242
N8-1	ID	W of site on Rt 382, 1/2 mi North of Lewisberry	73	7.8	260
P8-1	ID	WNW of site on Evergreen Rd, Reeser's Summit	74	8.0	292
P7-1	M	WNW of site on Old York Rd, New Cumberland	75	6.7	293
Q9-1	SW, ID	NW of site across from pkg lot of Steelton Water Company	76	8.5	308

THREE MILE ISLAND NUCLEAR STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM STATION LOCATIONS AND SAMPLE TYPE COLLECTED

Station Code	Sample Medium	Description	Map Designation	Distance (Miles)	Azimuth (Degrees)
R9-1	ID	NNW of site on Derry St, Rutherford Hgts	77	8.1	340
A15-1	M, FPL	NNE of site, farm on Rt 39, Hummelstown	78	10.5	10
C20-1	ID	NE of site on Cumberland St, Lebanon	79	19.6	47
D15-1	ID	ENE of site, Rt 241, Lawn, PA	80	10.9	63
D15-2	MG, FPL	ENE of site, Rt 241, 200 meters So of PA Tpk, Davidhizer Farm	81	10.0	68
F25-1	ID	ESE of site, Steel Way and Loop Roads, Lancaster	82	21.1	113
F15-1	SW	ESE of site, Chickies Creek	83	12.6	122
G15-1	SW, ID	SE of site at Columbia Water Treatment Plant	84	14.4	124
G15-2	SW	SE of site, Wrightsville Water Treatment Plant	85	13.6	128
G15-3	SW	SE of site, Lancaster Water Treatment Plant	86	14.8	124
H15-1	ID	SSE of site, Orchard and Stonewood Roads, Wilshire Hills	87	13.2	157
J15-1	AP, AI, ID	S of site in Met-Ed York Load Dispatch Station	88	12.6	180
J15-2	SW	S of site at York Water Company	89	14.7	178
K15-1	ID	SSW of site, Alta Vista Rd, Weiglestown at Dover Twp Fire Dept Bldg	90	12.7	12.7
204			91	11.7	225
L15-1	ID	SW of site on West side of Rt 74, Mt Royal	92	11.9	11.9
M15-1	ID	WSW of site, West side of Rt 74, in front of Earth Crafts, Rossville			
237			93	13.6	253
M15-2	FPF	WSW of site on W side of Rt 74, Larew's orchard	94	13.2	276
N15-1	ID	W of site, Orchard Lane and Hertzler Rd, Mt Allen	95	10.4	274
N15-2	ID	W of site, Lisburn Rd and Main St, Lisburn	96	12.2	300
P15-1	ID	WNW of site on Erford Rd in front of Penn Harris Motel, Camp Hill	97	13.5	305
Q15-1	AP, AI, RW	NW of site at West Fairview Substation			
	ID, S		98	11.5	310
Q15-2	ID	NW of site, Penn and Forster Streets, Harrisburg	99	11.2	330
R15-1	ID	NNW of site, Rt 22 and Colonial Rd, Colonial Park	100	9.2	0
A9-1	S	N of site off of Union Deposit Road	101	9.3	357
A9-2	FPL, S	N of site on Union Deposit Rd, W of Hoernerstown	102	0.7	90
E1-3	FPL	E of site, 100 m W of Peck Rd and Zion Rd intersection	103	1.1	80
E2-1	FPL, S	E of site on Zion Rd	104	1.3	133
G2-2	S	SE of site on Engle Rd			

THREE MILE ISLAND NUCLEAR STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM STATION LOCATIONS AND SAMPLE TYPE COLLECTED

Station Code	Sample Medium	Description	Map Designation	Distance (Miles)	Azimuth (Degrees)
GJ-1	S	SE of site on Governor's Stable Road	105	2.8	131
PJ-1	FPL	WNW of site on Rt 392 (Yocumtown Road)	106	2.6	293
Indicator	AQF,	All locations where fish and plants are collected below the discharge	-	-	-
	AQP	are grouped together and referred to as "indicator" (i.e., sectors 11 and geographically below)			
Control	AQF,	All locations where fish and plants are collected above the discharge		-	-
	AQP	are grouped together and referred to as "control" (i.e., Sectors 12 and geographically above)			
K2-2	AQS	SSW of site E of Shelley Island	107	1.1	197
A3-3	S	N of site at junction of Swatara Creek and Route 441	108	2.5	354
E2-2	M	E of site on Peck Road	109	1.1	93
H1-2	FPL, FPF	SSE of site, stand off of Rt 441	110	0.9	150
D1-3	FPF	ENE of site, house next to Yinger's Greenhouse on Rt 441	111	0.5	65
G2-3	S	SE of site, near Conewago Creek	112	1.6	132

IDENTIFICATION KEY

ID - Immersion Dose (TLD)	CR - Cryogenic Air Sample	AQF - Fish
SW - Surface Water	RW - Rain Water	AQP - Aquatic Plants
AI - Air Iodine	M - Milk (Cow)	AQS - Aquatic Sediment
AP - Air Particulate	MG - Milk (Goat)	FPL - Green Leafy Vegetation or Vegetables
S - Soil	EW - Effluent Water	FPF - Fruit

THREE MILE ISLAND NUCLEAR STATION
REMP SAMPLE ANALYSIS, COLLECTION AND ANALYSIS FREQUENCY BY SAMPLE MEDIUM

<u>Sample Medium</u>	<u>Number of Sampling Locations</u>	<u>Collection Frequency</u>	<u>Analysis Type</u>	<u>Analysis Frequency</u>
Air Particulate	8	Weekly	Gr-Beta Gamma Gr-Alpha Sr-89 Sr-90	Weekly Composite Monthly Composite Quarterly Composite Quarterly Composite Quarterly Composite
Air Iodine	8	Weekly	I-131	Weekly Composite
Precipitation	5	Monthly	Gr-Beta Gamma H-3 Sr-89 Sr-90	Monthly Composite Quarterly Composite Quarterly Composite Semiannual Composite Semiannual Composite
Milk *	8	Semimonthly	I-131 Gamma Sr-89 Sr-90	Semimonthly Composite Semimonthly Composite Quarterly Composite Quarterly Composite
Fish	2	Semiannually	Gamma Sr-89 Sr-90	Semiannual Composite Semiannual Composite Semiannual Composite
Aquatic Sediment	3	Semiannually	Gamma Sr-89 Sr-90	Semiannual Composite Semiannual Composite Semiannual Composite

THREE MILE ISLAND NUCLEAR STATION
 REMP SAMPLE ANALYSIS, COLLECTION, ANALYSIS FREQUENCY BY SAMPLE MEDIUM

<u>Sample Medium</u>	<u>Number of Sampling Locations</u>	<u>Collection Frequency</u>	<u>Analysis Type</u>	<u>Analysis Frequency</u>
Surface/Drinking Water	11	Weekly Biweekly	I-131 I-131 Gr-Beta Gamma H-3 Sr-89 Sr-90	Weekly Composite & Grab Biweekly Composite Monthly Composite Monthly Composite Monthly Composite Quarterly Composite Quarterly Composite
Effluent/Influent Water	2	Weekly Biweekly	I-131 I-131 Gr-Alpha Gr-Beta H-3 P-32 Fe-55 Gamma Scan Sr-89 Sr-90	Weekly Composite Biweekly Composite Monthly Composite Monthly Composite Monthly Composite Monthly Composite Monthly Composite Monthly Composite Quarterly Composite Quarterly Composite

THREE MILE ISLAND NUCLEAR STATION
REMP SAMPLE ANALYSIS AND COLLECTION AND ANALYSIS FREQUENCY

<u>Sample Type</u>	<u>Number of Sampling Locations</u>	<u>Collection Frequency</u>	<u>Analysis Type</u>	<u>Analysis Frequency</u>
Aquatic Plants	2	Semiannually	Sr-89 Sr-90 Gamma	Semiannual Composite Semiannual Composite Semiannual Composite
Vegetables/Green Leafy Vegetation	8	Annually	I-131 Gamma	Annual Composite Annual Composite
Fruits	4	Annually	Gamma I-131	Annual Composite Annual Composite
Dosimeters (TLD)	86	Quarterly	Gamma Immersion Dose	Quarterly
Soil	11	Semiannually	Gamma Sr-89 Sr-90	Semiannual Composite Semiannual Composite Semiannual Composite
Cryogenic Air Sample	4	Weekly	Kr-85	Weekly Composite

* During the grazing season, April 1 through October 31, milk sample collection will be biweekly.

APPENDIX I

KEY STAFF AND OFFICES FOR LONG-TERM MONITORING PROGRAM - TMI

<u>ORGANIZATION</u>	<u>TITLE</u>	<u>NAME</u>	<u>DUTY PHONE</u>	<u>NIGHT NUMBER</u>
EPA	Director, TMI Field Sta.	William P. Kirk	FTS 590-3909	(717) 533-6192
	Region III - Environmental Services Div.	Robert Mitkus	FTS 597-9390	(609) 654-7482
	Director, Office of Radiation Programs	Glen L. Sjoblom	FTS 557-9710	(703) 430-3714
	Emergency Response Coordinator	Harry W. Calley	FTS 557-7380	(301) 926-4279
USPHS	Headquarters Coordinator	John Villforth	FTS 443-4690	(301) 424-5912
	PHS Onsite Coordinator	Charles Cox	FTS 443-2850	(301) 299-9172
NRC	Acting Deputy Program Director, TMI Program Office	Philip J. Grant	FTS 590-1120	(717) 566-3337
	Chief, Site Operations	A. N. Fasano	FTS 590-1120	(717) 367-8314
	Chief, Technical Support Section	Ronald Bellamy	FTS 590-1138	(717) 566-9447
	Radiation Specialists	Barry O'Neill	FTS 590-1145	(717) 944-0700
		Thomas Moslak	FTS 590-1141	(717) 944-0377
		Kim Barr	FTS 590-1142	(717) 566-6417
DOE	Acting Director, Radiological Controls Div., Office of Nuclear Safety, DOE Emergency Center	L. Joe Deal	FTS 233-4093 FTS 233-5555	(301) 353-5555
<u>PENNSYLVANIA:</u>				
DER	Director, Bureau of Radiation Protection	Thomas M. Gerusky	(717) 787-2480	(717) 763-9041
BWQM	Director, Bureau of Water Quality Management	Lewis Berchini	(717) 787-2666	(717) 432-5658
		Kenneth Walizer	(717) 787-8184	(717) 657-0031
		James Flesher	(717) 787-9665	(717) 921-8765
		R. Harry Bittle	(717) 787-5027	(717) None given
PEMA	Pennsylvania Emergency Management Agency		FTS 783-8150	24 hours

APPENDIX I (continued)

MARYLAND:

DH&MH	Chief, Division of Radiation Control	Robert E. Corcoran Richard Brisson	FTS 932-2774 FTS 932-2744	(301) 823-8328 (301) 838-8359
Lancaster Water Company		Michael Freedman	(717) 291-4741	(717) 755-0120
Wrightsville Water Company		Paul Cover David Walsh Donald Ziegler Michael Gephart	(717) 252-3711 (717) 657-2147 (717) 657-2147 (717) 657-2147	(717) 564-8220 (717) 938-5823
Columbia Water Company		Charles Gohn	(717) 684-2188	(717) 684-5862

Three Mile Island Mailing Addresses:

EPA U.S. Environmental Protection Agency
 P. O. Box 103
 100 Brown Street
 Middletown, PA 17057

U.S. Public Health Service
 c/o U.S. EPA - TMI Field Station
 P. O. Box 103
 100 Brown Street
 Middletown, PA 17057

NRC U.S. Nuclear Regulatory Commission
 TMI Program Office
 P. O. Box 311
 Middletown, PA 17057

SUMMARY OF ENVIRONMENTAL MONITORING - EPA

SEPTEMBER 1985

AMBIENT GAMMA RADIATION

TYPE	GPUN	EPA	PA-DER	NRC	TOTAL
	NO. LOCATIONS (READINGS/YR)	NO. LOCATIONS (READINGS/YR)	NO. LOCATIONS (READINGS/YR)	NO. LOCATIONS (READINGS/YR)	NO. LOCATIONS (READINGS/YR)
PRESSURIZED IONIZATION CHAMBERS (REUTER-STOKES "SENTRI" SYSTEM)	16 (CONT.)	13 (CONT.)	NONE	NONE	29 (CONT.)
THERMOLUMINESCENT DOSIMETERS (TLD's)	86 (5504)	34 (408)	18 (456)	67 (2144)	200 (8512)*

*THE NUMBER GIVEN IS THE NUMBER PROVIDED IN THE CURRENT MONITORING PLAN.
(THE NUMBER OF TLD READINGS MAY INCREASE DURING VARIOUS OPERATIONS.)

SUMMARY OF ENVIRONMENTAL MONITORING - TMI

SEPTEMBER 1985

AIR

<u>TYPE</u>	GPUN NO. LOCATIONS (READINGS/YR)	EPA NO. LOCATIONS (READINGS/YR)	PA-DER NO. LOCATIONS (READINGS/YR)	NRC NO. LOCATIONS (READINGS/YR)	TOTAL NO. LOCATIONS (READINGS/YR)
PARTICULATES	8 (416)	16 (936)	3 (156)	1 (52)	25* (1560)
RADIOIODINE	8 (416)	14 (728)	3 (156)	NONE	22 (1300)
KRYPTON-85	4 (208)	4 (104)	NONE	NONE	8 (312)
TRITIUM	NONE	5 (260)	NONE	NONE	5 (260)

*SAMPLERS OF SEVERAL AGENCIES AT SAME LOCATION.

SUMMARY OF ENVIRONMENTAL MONITORING - TMI

SEPTEMBER 1985

WATER

<u>TYPE</u>	GPUN NO. LOCATIONS <u>(READINGS/YR)</u>	EPA NO. LOCATIONS <u>(READINGS/YR)</u>	PA-DER NO. LOCATIONS <u>(READINGS/YR)</u>	NRC NO. LOCATIONS <u>(READINGS/YR)</u>	TOTAL NO. LOCATIONS <u>(READINGS/YR)</u>
INFLUENT/EFFLUENT	2 (78)	2 (760)	NONE	NONE	2* (838)
SURFACE	11 (572)	2 (156)	NONE	NONE	13 (728)
WELLS	NONE	5 (20)	NONE	NONE	5 (20)
PRECIPITATION	5 (60)	1 (12)	NONE	NONE	6 (72)

*GPUN and EPA SAMPLERS ARE COUNTED AS BEING AT THE SAME PLACE SINCE THEY ARE SAMPLING THE SAME PROCESS STREAM ALTHOUGH THEY ARE NOT IN EXACTLY THE SAME LOCATION.

SUMMARY OF ENVIRONMENTAL MONITORING - TMI

SEPTEMBER 1985

AQUATIC

TYPE	GPUN	EPA	PA-DER	NRC	TOTAL
	NO. LOCATIONS <u>(READINGS/YR)</u>	NO. LOCATIONS <u>(READINGS/YR)</u>	NO. LOCATIONS <u>(READINGS/YR)</u>	NO. LOCATIONS <u>(READINGS/YR)</u>	NO. LOCATIONS <u>(READINGS/YR)</u>
SEDIMENT	3 (6-COMPOSITES)	NONE	QA/QC WITH GPUN	NONE	3 (6-12)
VEGETATION	2 (4-COMPOSITES)	NONE	NONE	NONE	2 (4)
FISH	2 (4-COMPOSITES)	NONE	QA/QC WITH GPUN	NONE	2 (4-8)

SUMMARY OF ENVIRONMENTAL MONITORING - TMI

SEPTEMBER 1985

MISCELLANEOUS

<u>TYPE</u>	GPUN NO. LOCATIONS <u>(READINGS/YR)</u>	EPA NO. LOCATIONS <u>(READINGS/YR)</u>	PA-DER NO. LOCATIONS <u>(READINGS/YR)</u>	NRC NO. LOCATIONS <u>(READINGS/YR)</u>	TOTAL NO. LOCATIONS <u>(READINGS/YR)</u>
MILK	8 (480)	NONE	2 (24)	NONE	10 (504)
VEGETATION	8 (8)	NONE	QA WITH GPUN	NONE	8 (8-16)
FRUIT	4 (4)	NONE	NONE	NONE	4 (4)
SOIL	11 (22)	NONE	NONE	NONE	11 (22)

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