

ORIGINAL

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION**

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UNITED STATES OF AMERICA

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NUCLEAR REGULATORY COMMISSION

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BRIEFING ON STATUS OF TMI-2

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PUBLIC MEETING

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Nuclear Regulatory Commission

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Room 1130

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1717 H Street, N.W.

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Washington, D.C.

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March 17, 1988

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The Commission met in open session, pursuant to

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notice, at 2:03 p.m., the Honorable LANDO W. ZECH, JR.,

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Chairman of the Commission, presiding.

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Commissioners Present:

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LANDO W. ZECH, Chairman

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THOMAS M. ROBERTS, Commissioner

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FREDERICK M. BERNTHAL, Commissioner

23

KENNETH ROGERS, Commissioner

24

KENNETH M. CARR, Commissioner

25

1 Staff and presenters seated at table:

2

3 S. J. CHILK - SECY

4 W. G. KUHNS

5 P. R. CLARK

6 E. E. KINTNER

7 F. R. STANDERFER

8 R. Q. MARSTON

9 W. C. PARLER - OGC

10

11 Audience Speakers:

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13 Eric Beckjord

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## P R O C E E D I N G S

[2:03 p.m.]

CHAIRMAN ZECH: Good afternoon, ladies and gentlemen. This is an information briefing by GPU Nuclear Corporation on the status of the Three Mile Island Unit 2 cleanup.

There is no commission voting actions anticipated at this briefing this afternoon. This is the fourth annual meeting to bring the Commission up to date on the status and plans for the future activities at TMI-2.

We will hear from General Public Utilities Nuclear executives and from the chairman of the TMI-2 Safety Advice Board.

I understand that the defueling has progressed to the point where about 60 percent of the fuel has been shipped to a Department of Energy facility in Idaho. The progress at TMI-2 is of continuing interest to the Commission and we look forward to hearing about the status of the work.

We are also interested in the plans for the longer term care and monitoring of the plant.

We are interested too in hearing about the efforts to characterize the molten mass at the bottom of the TMI-2 reactor vessel.

The presentation today I understand includes a

1 videotape of the 1987 work which the NRC is now  
2 participating in funding.

3           Mr. Kuhns, we were saddened to hear of the  
4 untimely passing of Mr. Jack O'Leary last February and we  
5 thank you for your willingness to return and to serve at  
6 that time. We welcome you and your colleagues, and we are  
7 pleased to have you here today.

8           Any comments from my fellow Commissioners before  
9 we begin? Commissioner Roberts will be joining us  
10 shortly.

11           You may begin, Mr. Kuhns, and welcome again.

12           MR. KUHNS: Thank you, Mr. Chairman,  
13 Commissioners. I am Bill Kuhns, chairman of the  
14 board/chief executive officer of GPU and chairman of the  
15 board of GPU Nuclear.

16           With me today are Phil Clark, president/chief  
17 executive officer of GPU Nuclear; Ed Kintner, executive  
18 vice president of GPU Nuclear; Frank Standerfer, vice  
19 president and director of the TMI-2 program for GPU  
20 Nuclear. Also with us is Dr. Robert Marston, chairman of  
21 the TMI-2 Safety Advisory Board since May of '86 when Dr.  
22 Jim Fletcher who was then chairman returned to NASA.

23           When we appeared before you in February of '87, I  
24 did introduced Jack O'Leary as you indicated,  
25 Mr. Chairman, as my replacement as chairman of GPU, and

1 Jack did indeed die an untimely death and a sad death  
2 after serving as chairman of our corporation for only  
3 seven months. He did a super job while he was there and  
4 we miss him. I was then asked to return and I did on  
5 December 19.

6 We are pleased to be back for this fourth annual  
7 report to you on the cleanup of TMI-2. We continue to  
8 believe that the successful completion of this cleanup  
9 program and the extraction of as much information as we  
10 can obtain from it have great significance to the NRC, the  
11 nuclear industry, and of course to the our own company.

12 In each of our previous meetings with you, I  
13 committed the GPU system's full support for safely  
14 completing the TMI-2 cleanup and for the safe operation of  
15 TMI-1. And I reaffirm those commitments to you today.

16 The cleanup is proceeding without financial  
17 constraints, and we now believe despite some continuing  
18 uncertainties that the plant work will be completed within  
19 the \$1 billion funding program.

20 The various contributors under the plan, all of  
21 them are current in providing continuing cleanup funding,  
22 and an updated funding plan is attached to our information  
23 here as Attached A.

24 The system, the GPU system's present energy  
25 supply plans do not reflect the return to service of

1 TMI-2, and no funds are presently being expended to  
2 preserve that plant and its equipment for any future use.

3 TMI-1 continues to operate well; very good  
4 capacity factors compared to the other plants. We intend  
5 to continue to supply the personnel, the training, and the  
6 management support necessary to maintain the excellent  
7 TMI-1 record since you authorized restart in October of  
8 1985.

9 TMI-2 cleanup operations have continued without  
10 significant safety incidents and now with the removal of  
11 all of the fuel from the initial core volume and shipment  
12 of much of it off site, the safety implications of TMI-2  
13 have been further mitigated.

14 Upon completion of the cleanup program, we plan  
15 to place the plant into monitored storage: A safe,  
16 stable, and secure condition suitable for the long term.

17 Now I would like to turn it over to Phil Clark,  
18 president of GPU Nuclear.

19 COMMISSIONER BERNTHAL: May I just ask one  
20 question?

21 MR. KUHNS: Yes, sir.

22 COMMISSIONER BERNTHAL: I know that you had a  
23 three month planned outage at TMI-1. Was that to do some  
24 specific maintenance items? I seem to recall some steam  
25 generator work. Is that the principle reason?



1 MR. CLARK: That was actually a five month outage  
2 of which the last three months came in '87.

3 COMMISSIONER BERNTHAL: I see. Okay.

4 MR. CLARK: It was refueling and the major work  
5 was Appendix R.

6 COMMISSIONER BERNTHAL: Okay.

7 MR. CLARK: But it was just a five month outage,  
8 and we just counted here the '87 part of it.

9 COMMISSIONER BERNTHAL: All right. Thanks.

10 CHAIRMAN ZECH: Thank you. You may proceed.

11 MR. CLARK: I really appreciate the opportunity  
12 to discuss TMI-2 directly with you again.

13 We think we are making good progress in a  
14 difficult and unprecedented project. We believe we are  
15 now at the point where we can see fairly clearly the end  
16 of the cleanup program.

17 You may recall cleanup is integrated between GPU  
18 Nuclear and Bechtel. The director Frank Standerfer is a  
19 vice president on the company, and then the deputy  
20 director who is here with us today, Tom Demmitt, is a  
21 program manager of Bechtel National.

22 People fill the positions in the organization  
23 without real consideration of their parent organization,  
24 and while GPU Nuclear is responsible, we have fully  
25 integrated the operation. I think it's working quite

1 effectively.

2 In addition to the GPU Nuclear and Bechtel, a  
3 major contractor primarily supplying labor is Catalytic  
4 Construction Company.

5 We have today working on the cleanup about 960  
6 people: 475 GPU, 145 Bechtel, 275 Catalytic, and 65  
7 others.

8 Last year when we appeared before you, that  
9 number was 1,030. You can see the work force is being  
10 reduced, and while there is not a great reduction as yet,  
11 this is going to continue at an increasing rate during  
12 1988.

13 A year from now we expect the total work force at  
14 TMI-2 to be less than 400. So comparative to the 960 now,  
15 we'll be down by more than half we expect.

16 We are taking special steps to try to see that we  
17 retain the capability to do the remaining work safely. We  
18 have a thought-out program for phase down, retention  
19 bonuses, things like that, but it is something that as we  
20 go forward is going to be very important to us.

21 During the last three discussions with the  
22 Commission, we described our plan for safe, stable, and  
23 secure storage of the facility following removal of the  
24 fuel and decontamination of the major radiation sources.  
25 We've called this post defueling monitored storage.

1           It is based on the following principles: Fuel  
2 has been removed and shipped off site such that the  
3 criticality is precluded.

4           Potential for a significant release of  
5 radioactivity has been eliminated.

6           Water has been removed from the systems and the  
7 potential for reintroduction of water has been minimized.

8           Radioactive wastes have been packaged and shipped  
9 off site or are safely stored pending shipment.

10          Radiation has been reduced to levels which will  
11 allow monitoring of the plant, performance of required  
12 maintenance, and plant inspections.

13          Finally, containment systems will be maintained  
14 in accordance with NRC approved technical specifications.

15          I think meeting these will provide three separate  
16 levels of public protection: First is inherent stability.  
17 The plant will be in a condition which is not open to  
18 transients or accidents.

19          Second -- and we have more detail here which I'd  
20 go in, but I think you've seen it before -- second, we'll  
21 have effective containment. They have an inherently  
22 stable plant inside an effective containment with closed  
23 systems and a locked reactor containment building, and  
24 finally we'll have positive monitoring and control. We  
25 will be conducting radiological and environmental

1 monitoring. We will maintain plant protection systems  
2 such as fire protection, and we will maintain plant  
3 security by enclosing TMI-2 basically within the TMI-1  
4 security boundary and a fence.

5 We will have available on site trained manpower  
6 and equipment from TMI-1 in addition to what we see as a  
7 small work force devoted to TMI-2.

8 So we think in short that we will have a safe  
9 monitored plant condition which can be maintained  
10 indefinitely when we enter PDMS.

11 This plan has been discussed over several years  
12 with the TMI-2 Safety Advisory Board, and Dr. Marston will  
13 comment with your project staff and with the NRC Advisory  
14 Panel on the cleanup of TMI-2.

15 We are moving to formalize actions on this plan  
16 by submitting changes to our technical specifications.

17 Frank Standerfer will discuss the plan and its  
18 status in some more detail.

19 Your staff has prepared a draft Environmental  
20 Impact Statement on PDMS and it's our understanding that  
21 that would be ready for issue as the draft early next  
22 month.

23 We think this is a sound plan that results in a  
24 condition that poses no risk to public health and safety.  
25 The reviews over the past years have not identified any

1 substantial safety or health concerns with the PDMS plan.

2 [At 2:12 p.m., Commissioner Roberts joined  
3 the proceedings.]

4 MR. CLARK: As we indicated earlier, we are  
5 proceeding to accomplish the planned work and phase down  
6 the staffing. Contractors are being let go; our own  
7 people are being reassigned, some of them within the  
8 system; some will be leaving GPU system entirely. So it  
9 is extremely important during this next year that we reach  
10 agreement on all the work that remains to be done. We are  
11 and we need to be staffing down.

12 Two years ago, the Commission recommended that we  
13 take special steps to assure public understanding of what  
14 is happening at TMI-2 and the reduction and potential  
15 threat which cleanup progress was providing. We have  
16 continued a major effort in that area.

17 During '87 we had 17 specific news releases on  
18 TMI-2, nine status reports on TMI-1 and 2 to the local  
19 news outputs. We published a series of newspaper ads on  
20 the progress of the cleanup program. We've continued  
21 meeting with the local town governments for residence and  
22 reporting monthly to the local governments and  
23 periodically to state and federal officials.

24 We really have had I think a very active program  
25 in that area. As a result, we are finding a significant

1 increase in satisfaction among the public with the way the  
2 cleanup program is being handled, and we are finding  
3 increased sentiment among local residents who are seeing  
4 the cleanup program come to an end.

5           Finally as you are probably aware, there have  
6 been questions raised recently by members of the House and  
7 Senate about DOE's program of TMI's fuel shipments and DOE  
8 taking possession of the core.

9           If this results in delay or interruption of the  
10 shipments, it will delay completion of the cleanup  
11 program. We are working with DOE and others to try to  
12 prevent any delay, although based on what we now  
13 understand since we've prepared this, it's my impression  
14 that there will be a several month delay in completing  
15 shipment of some fuel from the Island and that that will  
16 impact entering into PDMS.

17           Nonetheless, that is an important issue. I think  
18 with potential for further delay, that we are working on  
19 it as hard as we know how.

20           At that point, I would like to -- or this point,  
21 I'd like to turn it over to Ed Kintner unless there are  
22 questions.

23           CHAIRMAN ZECH: All right. You may proceed.  
24 Thank you very much.

25           MR. KINTNER: When we met with you a year ago, we

1 described the delay we had incurred in defueling due to  
2 turbidity in the water in the reactor vessel which many  
3 times limited visibility to an inch.

4           Fortunately the corrective action which we  
5 developed worked better than we could have hoped, and the  
6 original system design required -- specified a million  
7 gallons of through put to each filter; we were getting  
8 about 10,000 gallons at that time, while the problem was  
9 height. We are now filtering over 10 million gallons  
10 before the filters clogged and so that has been providing  
11 us with good visibility and allowed the good progress  
12 we've made this year.

13           There is one other factor which allowed us to  
14 make such good progress in '87. Water level in the vessel  
15 did not get down to the core support structure. So that  
16 the last two to four feet of the subassemblies were always  
17 covered with water.

18           So as you can see in some of the pictures later,  
19 the molten fuel did not go down through the core support  
20 assembly and cause any brazing of these assemblies to the  
21 support structure, and that allowed all but one of the 177  
22 assemblies to be pulled up easily and put into canisters.  
23 It made it much easier than it would otherwise been, and  
24 is a major reason why we were able to get so much of the  
25 fuel out this year.

1           That fuel which has been shipped, and the samples  
2 as well as the masses of the fuel, have been the subject  
3 of a very considerable amount of research in INEL and some  
4 very interesting things have been discovered and reported.

5           There is an IAEA meeting this week in Italy and  
6 on one of the major papers there -- the summary paper on  
7 the results of TMI-2 research.

8           Last year we also talked to you about the  
9 significance to safety of the fact that some 20 tons of  
10 molten corium material flowed down into the bottom head of  
11 the vessel apparently in a minute or so; and the vessel  
12 did not fail, the boundary remained intact.

13           The Commission picked that point up and pressed  
14 to investigate it fully, and as a result of that you now  
15 have a safety program under Dr. Beckjord. We are working  
16 very closely with him.

17           Electric Power Research Institute has now joined  
18 in in support of that program and I believe that there  
19 will be a thorough investigation in the matter before the  
20 containment is closed up.

21           Before we completed the removal of the core  
22 subassemblies stubs, we knew that we were going to have to  
23 cut through this whole assembly of five layers of core  
24 support structure to get the fuel out of the bottom in any  
25 significant -- for any significant cleanliness. That was



1 something we really didn't have the slightest idea how to  
2 do it.

3 We developed two different techniques. One which  
4 uses the core boring equipment the Department of Energy  
5 had provided to take the initial core samples. We've now  
6 extended use of that to cut through the core support  
7 assemblies and we are in fact moving with that process  
8 now.

9 In addition, we've developed plasma arc cutting  
10 equipment which will have to work under 45 feet of borated  
11 water. We've tested it thoroughly and we think it will  
12 work and the last stages of this disassembly in core  
13 support is going to be done using that plasma arc  
14 technique.

15 COMMISSIONER BERNTHAL: Have you thought about  
16 selling any of this to the Navy when you're done?

17 MR. KINTNER: I don't know. Are there any Navy  
18 members present?

19 MR. CLARK: Maybe DOE should, they own some of  
20 that stuff.

21 CHAIRMAN ZECH: Go ahead.

22 MR. KINTNER: Now, I would like to talk a little  
23 bit about disposal of accident-generated water. There is  
24 two million gallons of that water which was associated in  
25 one way or another with the accident, it's stored on the

1 Island.

2 In the normal course of events, it could be  
3 discharged into the Susquehanna well within the limits  
4 imposed in any other place in the world, but because of  
5 the fact that it is TMI-2 and the public objections to it  
6 in that area, there are special arrangements required.

7 We proposed to evaporate the water and take the  
8 solidified bottoms and handle them as solid waste, and we  
9 have -- we believe we've proposed something which is  
10 totally acceptable from a standpoint of environmental  
11 effect we believe. The staff agrees with that and said so  
12 in Supplement 2 to the Preliminary Environmental Impact  
13 Statement which was issued last July.

14 We are now in the middle of a public hearing  
15 process on that subject, and it appears that this matter  
16 will not find its way back to the Commission before  
17 December which is two and a half years after the original  
18 proposal; thus actual disposition of water will not be  
19 completed at best before we would enter into PDMS.

20 The design, fabrication, installation of the  
21 evaporator system will take about nine months. If we  
22 waited for final approval that would be a further delay in  
23 the completion, so at our risk last month authorized the  
24 system vendor to proceed with the design, fabrication of  
25 the evaporator system for this specific TMI-2 application.

1           Throughout the cleanup project it has been  
2 monitored by the Safety Advisory Board made up of ten  
3 outstanding scientists in the various fields important to  
4 assuring the continued safe conduct of the work.

5           The Safety Advisory Board chairman has reported  
6 to you each time we have. Last year was Dr. Marston;  
7 before that, Jim Fletcher. And Dr. Marston is here today  
8 to report on their conclusions with regard to work at the  
9 Island.

10           Dr. Marston has very strong credentials including  
11 five years as head of the National Institute of Health,  
12 ten years as president of the University Florida System  
13 and here he has shared some of the problems with  
14 Commissioner Rogers from his background in the university  
15 and college systems.

16           It's our intent -- the Safety Advisory Board will  
17 continue to monitor the work until the cleanup program is  
18 complete. We don't believe that we'll ask them to  
19 discharge their responsibilities before work is -- it's  
20 quite clear that the issues associated with safety, public  
21 in that area, are settled.

22           As you know on February 1st, the NRC site office,  
23 project office at the site, was closed. We now have the  
24 more typical interface with Region 1, the program staff  
25 here in Washington. I would very much like to express our

1 appreciation for the great assistance given the TMI-2  
2 cleanup program by the project office first under  
3 Dr. Snyder who's here in the audience today; more recently  
4 under Dr. Bill Travers. Their confidence,  
5 professionalism, and hard work have been essential to  
6 carry out this program safely. I'd have to say despite  
7 the major technical issues associated with safety in the  
8 entire cleanup, at no time has approval from NRC Staff in  
9 any way impeded our being able to go forward with the  
10 work.

11 Looking ahead to the next year or year and a  
12 half, the safe completion of this program will require  
13 additional NRC reviews and approval, and we're going to  
14 make a number of submittals over the next year, that will  
15 be in addition to the ongoing oversight inspections  
16 activities.

17 The site-located office has provided the focus  
18 and detailed understanding of the situation as we made our  
19 proposals. We've been discussing with your Staff the need  
20 to effectually address and resolve the remaining issue.

21 We and they both recognize I believe the need to  
22 monitor and track the progress so that completion of the  
23 program and the attendant removal of the remaining risk  
24 proceeds as promptly as safety will allow.

25 One point we are very proud of I think you will

1 be glad to hear is that the radiation doses to workers  
2 have been relatively low, less than projected.

3 The total dose from beginning of cleanup to this  
4 point is 4,600 manrem. The total dose in '87 was 975  
5 manrem.

6 If we don't run into any special problems from  
7 here on, we think another 1,400 manrem will allow us to  
8 complete the program which would make for a total overall  
9 of 6,000 manrem, and the estimated ranges in the NRC's  
10 Preliminary Environmental Impact Statement was 13,000 to  
11 46,000.

12 So I think here we again have been in some degree  
13 fortunate and to some degree I think there has been good  
14 work on the part of a number of people to make it come  
15 that way.

16 As the project now stands, we expect to complete  
17 the defueling operations in the last quarter of this year,  
18 and then unless there are fuel shipments delays which Phil  
19 has talked to, we will ship the last fuel off site in the  
20 first quarter of 1989 and then there will be another two  
21 or three months we'll have to dewater the fuel pools and  
22 pack up some of the remaining solid wastes. We would then  
23 hope to be able to place the plant in the defueled  
24 monitored storage condition -- late Spring of '89.

25 Now Frank Standerfer has some videotapes and

1 other information -- more details of the cleanup as it  
2 proceeds.

3 MR. STANDERFER: This brief video shows the  
4 progress that was made last year and shows some of the  
5 cutting that we were doing in the last two months.

6 [A video presentation was shown at this  
7 time.]

8  
9 MR. STANDERFER: I might draw your attention to  
10 Attachment C which is the defueling progress curve versus  
11 time. The defueling began in the Fall of 1985; the first  
12 fuel was actually transferred from the reactor in January  
13 '86.

14 During '86 many challenges arose using a new and  
15 unique tools and techniques to remove the damaged fuel;  
16 however -- and it was very slow in 1986.

17 However by early 1987 a number of solutions to  
18 these problem had been developed. These included the  
19 method to maintain clear water in the reactor vessel that  
20 Ed Kintner referred to, and the development of many new  
21 tools.

22 One new tool was an air-lift system which you saw  
23 on the videotape. Other tooling modifications included  
24 improvements to the tools to remove partial fuel  
25 assemblies which you saw on the tapes.

1           More than twice as much fuel debris was loaded in  
2 1987 than in 1986. At the beginning of 1987, 20 percent  
3 of the core debris had been removed from the reactor  
4 vessel, and by year's end about two-thirds, or 195,000  
5 pounds of fuel debris had been loaded into canisters and  
6 removed from the reactor. The debris is made up of the  
7 damaged fuel and internal reactor components.

8           The next attachment, Attachment D, shows our  
9 estimate of the 98,000 pounds of fuel that remains in the  
10 reactor. This is distributed with about 9,500 pounds in  
11 the upper core support assembly, about 27,000 pounds in  
12 the lower core support assembly, a little more than 60,000  
13 pounds in the bottom head of the reactor vessel proper,  
14 and about 1,000 pounds remain in various components in the  
15 primary system loop.

16           In addition to making headway in the actual  
17 removal of fuel debris, TMI-2 Division developed primary  
18 and alternate methods for future defueling.

19           The last phase of defueling will require  
20 different techniques and tools than the earlier phases  
21 did.

22           A major part of the defueling in 1988 will  
23 involve the cutting and disassembly of the internal  
24 components of the reactor.

25           In 1988 defueling plans require a significant

1 portion of the core support assembly to be cut apart and  
2 removed from the reactor vessel. This involves removing  
3 the stepped baffle plates from the upper core support  
4 assembly, and cutting and removing the center of the lower  
5 core support assembly.

6 I show a number of figures in the attached  
7 appendix which are rather detailed, but in summary, the  
8 lower core support assembly consists of five horizontal  
9 components. They are tied together vertically by 52  
10 incore instrument guide tubes and 48 support posts.

11 A combination of cuts with the core bore machine  
12 and the plasma arc cutting torch will result in opening up  
13 a nine foot diameter hole in the lower core support  
14 assembly.

15 This will allow defueling of the lower core  
16 support assembly and access to defuel the lower reactor  
17 vessel head.

18 This CSA cutting work was started in early  
19 January and was scheduled to be completed by the end of  
20 April. The work to date has taken about twice as long as  
21 originally planned. Although the cuts are coming out  
22 clean and exactly as we expected, it is taking a little  
23 longer. So we do not expect to finish the cutting by the  
24 end of April at the present time.

25 The stepped baffle plates in the upper core



1 support assembly are planned to be removed by a  
2 combination of plasma arc cuts and the removal of about  
3 860 bolts. These bolts will be removed either by  
4 unscrewing, drilling, and/or cutting.

5           There are approximately 60,000 pounds of fuel  
6 debris in the lower head of the reactor vessel. When  
7 we've gained sufficient access through the lower CSA, this  
8 fuel will be removed by vacuuming, air lifting, and  
9 picking up pieces. We may need to break up some large  
10 pieces, and we may encounter a layer of unknown  
11 consistency right on the bottom of the reactor vessel  
12 head.

13           [At 2:37, Commissioner Roberts leaves the  
14 proceedings.]

15           COMMISSIONER BERNTHAL: You still don't have a  
16 terribly good picture then of that of the physical  
17 characteristics of that?

18           MR. STANDERFER: We know that most of the  
19 material on the bottom is loose. We've put sample probes  
20 into it. We know there are some chunks down there. We've  
21 seen one of the instrument tubes that's been melted off in  
22 the lower head, we expect to find another 15 or 20 that  
23 look like that because the thermal cupples have reformed  
24 junctions down there, and we don't know whether there is a  
25 layer of materials -- resolidified material right on the

1 bottom head or whether it's just loose on the bottom.

2 MR. CLARK: I don't think we've seen anything  
3 fused to the reactor vessel head, or we haven't seen  
4 everything. What we've seen has tended to be chunks or  
5 what not.

6 I was going to suggest that if you go to the very  
7 back -- and if Frank will let me interrupt up -- if you  
8 look at Figure 1 which looks likes this. I think you're  
9 may be about seven now, Mr. Chairman?

10 CHAIRMAN ZECH: Yes.

11 MR. CLARK: That's the core support assembly as  
12 it existed and it shows the various layers and it shows  
13 the incore instrument thimbles coming through.

14 And now if you'll turn eight pages to Figure 8,  
15 the intermediate one shows step by step, and if you get to  
16 figure 8, we will have cut out and remove from the vessel  
17 all of the support structure that was on Figure 1 and is  
18 not on Figure 8.

19 COMMISSIONER BERNTHAL: And this you expect to  
20 achieve by --

21 MR. STANDERFER: Well, we expect that to take  
22 four months total, and it's going to take a little longer  
23 than four months, but late this spring that should be  
24 done. We also will be defueling various layers and  
25 corners as we go also.

1           MR. CLARK: So that's really what's underway now  
2 and I'm sure you've recognized that we are working down in  
3 amongst the instrument thimbles which come into the  
4 reactor vessel from the bottom.

5           MR. STANDERFER: Of course all of this cutting is  
6 being done with these tools between 30 and 40 feet away  
7 from where the men are.

8           The defueling of the ex-reactor vessel portions  
9 of the system was continued in 1987. This work included  
10 defueling the upper tube sheets of both steam generators,  
11 the pressurizer, both the A and B hot leg piping runs and  
12 an initial exploratory defueling of the defueling -- of  
13 the decay heat drop line and several other smaller piping  
14 systems.

15          In 1988, we will defuel the lower portions of the  
16 steam generators and related piping, the decay heat drop  
17 line which we entered for the first time this last fall,  
18 and the cold leg piping and the main coolant pumps.

19          All the while we've been shipping fuel, a  
20 shipment is done from the Island by the Department of  
21 Energy and is stored at Idaho. That was started in July  
22 of 1986.

23          The casks which the Department of Energy bought  
24 were two NRC license casks for the program, and this fall  
25 as the videotape indicated, we leased a third identical

1 shipping cask which was bought -- or leased as back up to  
2 the other two and to increase the flexibility in shipping  
3 schedules.

4           The shipments are now made by dedicated trains.  
5 To date, a total of 14 rail shipments or core debris have  
6 been made to the Idaho station, some included one cask,  
7 some two casks and some three casks.

8           The shipments contained a little over 176,000  
9 pounds of debris or a little more than 60 percent of the  
10 total core has been shipped.

11           The shipping has caused some frustrations on the  
12 project because extra costs have been required by a number  
13 of restrictions the railroads have imposed on us to go  
14 beyond existing DOT or NRC regulations; further, the  
15 shipments have been a target for opposition particularly  
16 in the St. Louis area where the transfer is made from  
17 CONRAIL to Union Pacific.

18           In the basement of the reactor vessel we washed  
19 down surfaces as shown in the videotape using the robots  
20 that have been developed for this work. We've used very  
21 high pressured sprays to remove the thin surface layer of  
22 the parts of the concrete that are particularly  
23 contaminated, and that work was finished in February of  
24 this year.

25           We also have devised a method to flush water

1 through the concrete block wall where there's still a  
2 significant quantity of radioactivity in the basement.

3           The two stairwells, one was contained by a  
4 concrete block wall for fire protection purposes and that  
5 block wall acted as a sponge for radioactivity and is the  
6 major source of activity in the basement, and the testing  
7 to date indicates that we can fill that block wall up with  
8 water and flush water through that porous structure, and  
9 if it is as successful as our testing indicates, we will  
10 dissolve and flush a significant quantity of the  
11 radioactivity from the block wall without having to  
12 physically remove the blocks themselves.

13           In the auxiliary and fuel handling buildings, we  
14 continued decontamination in 1987. We decontaminated nine  
15 systems, 29 cubicles, and they have reached the end point  
16 required for the post defueling monitored storage. These  
17 cubicles represent a little over 14,000 square feet of  
18 floor area.

19           In addition, the areas that have been previously  
20 decontaminated have been maintained clean as we've  
21 continued to work in the plant.

22           We in 1987 shipped a little over 23,000 cubic  
23 feet of low level waste to burial grounds. Prior to 1987  
24 all of the TMI-2 low level waste was sent to the U.S.  
25 ecology site in Washington state. As you may remember,

1 the South Carolina site was closed to us right after the  
2 accident.

3 In 1987 it was reopened and about 3 percent of  
4 the waste was sent to Barnwell in South Carolina and about  
5 97 percent was shipped to Hanford last year.

6 While these shipments last year exceed the annual  
7 volume targets in the 1985 Low Level Waste Policy Act for  
8 an annual shipment basis, we currently expect to complete  
9 the cleanup within the 7 year volume allocation for TMI-2  
10 in that Act.

11 In addition, we've received additional volume  
12 allocation from the Department of Energy for the bottoms  
13 that would be generated from the evaporation of the  
14 accident water.

15 In February of 1987, we placed into operation a  
16 new facility at TMI shown on the videotape to reduce the  
17 volume of low level waste that is shipped from the plant.

18 Finally, Attachment F indicates our current  
19 project schedule. It's based on completing defueling in  
20 the fourth quarter of this year. We expect to be ready to  
21 place the TMI-2 plant into post defueling monitored  
22 storage in May of 1989. That was based on finishing fuel  
23 shipping by March of 1989 which may be delayed past that  
24 point because of the shipping restrictions that Phil  
25 mentioned earlier.

1           In December of 1986, we provided the NRC with our  
2 plan for post defueling monitored storage. That was  
3 followed in 1987 with our submittal of the environmental  
4 evaluation for post defueling monitored storage and  
5 answers to the Staff's questions on it.

6           We understand that the NRC's draft Environmental  
7 Impact Statement for post defueling monitored storage will  
8 be issued for public comment early next month.

9           The time from the draft to final on accident  
10 water was six months so the final EIS for PDMS could be  
11 issued by October of this year.

12           In the next month, I will be submitting to the  
13 NRC a number of documents in support of our post defueling  
14 monitored storage proposal; that is the safety analysis  
15 report, the licensing and technical specification changes,  
16 the new quality assurance plan, the new fire protection  
17 plan, the new organization for PDMS, and revised TMI site  
18 emergency plans and security plans for the PDMS plant  
19 configuration.

20           It is important to effectively manage the  
21 remainder of the program and that these materials be  
22 reviewed and any questions be promptly resolved.

23           An effective conclusion of the TMI-2 cleanup  
24 program is dependent upon our achieving a conclusion to  
25 these submittals by January 1989.

1           MR. CLARK: Are there any questions at this  
2 point? I would like to ask Dr. Marston to provide his  
3 comments on behalf of the Safety Advisory Board.

4           CHAIRMAN ZECH: Dr. Marston, why don't you  
5 proceed.

6           MR. MARSTON: Thank you, Mr. Chairman. Since its  
7 inception in March of 1981, the TMI-2 Safety Advisory  
8 Board has reviewed on a continuing basis the cleanup  
9 operations performed in the damaged TMI-2 plant to ensure  
10 protection of the health and safety of the public and of  
11 the workers involved in the cleanup.

12                   [At 2:50, Commissioner Roberts joins the  
13 proceedings.]

14           MR. MARSTON: Although the cleanup is not  
15 complete, additional SAB safety reviews remain to be  
16 performed before the removal of damaged fuel from the  
17 reactor system is completed.

18           I plan to focus today on the safety of the TMI-2  
19 plant in the proposed post defueling monitored storage  
20 condition.

21           The Board has spent a significant fraction of the  
22 last year reviewing the effect on public health and worker  
23 health and safety when the TMI-2 plant is placed in the  
24 PDMS condition.

25           In November of 1987, the Board issued the



1 following statement: "Post defueling monitored storage  
2 has been analyzed in depth by the Safety Advisory Board,  
3 TMI-2. The Board has agreed that PDMS is an acceptable  
4 TMI-2 plant condition that when achieved, would pose no  
5 hazard to public health and safety." I want to emphasize  
6 that the Board continues to hold this position.

7 "On further Board review of the PDMS plant at a  
8 subsequent SAB meeting in February of 1988, it  
9 become apparent that in light of the extensive SAB  
10 reviews and deliberations on the technical and safety  
11 aspects of PDMS, documentation of the basis on the above  
12 statement was necessary." And I intend today to provide  
13 the Nuclear Regulatory Commission with that documentation.

14 The SAB is charged with oversight of the actions  
15 of GPUNC management to assure that those actions relating  
16 specifically to the cleanup of the damaged TMI-2 plant do  
17 not jeopardize the health and safety of the public and the  
18 workers.

19 These actions sometime require decisions which  
20 involve trade offs between health and safety, and some  
21 limited low level radiation exposure to the public and the  
22 workers.

23 This was a case, for example, when extremely  
24 small amounts of krypton gas were released to the  
25 environment in order to improve the ambient air quality

1 within the TMI-2 containment building and thus reduce the  
2 potential radiation exposure of workers who had to gain  
3 entry to begin the cleanup operations.

4           Whatever the costs of such trade offs and the  
5 personal exposure are in dollars, there has been no  
6 adverse effects on the public health and safety; although,  
7 the protection of the health and safety of the workers is  
8 a matter of highest priority, the SAB must continue to  
9 exercise a considerably greater responsibility in its  
10 concern of the effects of the cleanup on the health and  
11 safety of the public.

12           The 1979 accident at TMI-2 left the interior of  
13 the reactor building so contaminated with radioactivity,  
14 that entries by cleanup crews were not possible without  
15 extensive preparations and precautions to minimize their  
16 exposure.

17           A truly remarkable job has been accomplished in  
18 these past nine years. Only insignificant and negligible  
19 exposures of the public have occurred as well as  
20 remarkably limited exposure of workers as Mr. Kintner has  
21 just pointed out who have been carrying out the cleanup.

22           This has been achieved by judicious care,  
23 planning, deliberate steps, and appropriate decision  
24 making.

25           GPU Nuclear management has directed the

1 allocation of sizeable funds for the protection of workers  
2 and the public. Decisions were always in the direction of  
3 being overly safe.

4           Until recently the quantity of damaged fuel  
5 that's been present in the reactor vessel has been  
6 sufficient to require precautions against any inadvertant  
7 criticality occurrence, although the probability of  
8 occurence was extremely small.

9           A significant milestone will be achieved by the  
10 end of 1988, however, when more than 99 percent of the  
11 damaged fuel will have been removed from the reactor and  
12 most of it shipped to the nearest Department of Energy  
13 National Engineering Laboratory in Idaho.

14           The remaining small amount of fuel debris in the  
15 reactor system represents only a small fraction of the  
16 original fuel, and will pose no threat for criticality of  
17 radiation exposure to workers or the public.

18           At this stage, there will no longer be any need  
19 for special precautions such as maintaining borated water  
20 in the reactor vessel.

21           This does not mean that the plant interior has  
22 been fully decontaminated and that no radioactivity  
23 remains.

24           During the PDMS phase, workers will have access  
25 to most of the plant without protective clothing and with

1 little exposure to radiation. With the reactor building  
2 basement and a few places in the auxillary and fuel  
3 handling building, will remain radioactive to the extent  
4 that workers will not be permitted access to these areas;  
5 however, there appears to be no reasons for workers to  
6 enter these contaminated areas when the PDMS phase has  
7 been reached.

8           To ensure the health and safety of the public as  
9 well as the TMI-1 workers, TMI-2 plant conditions during  
10 the PDMS phase will be monitored continuously to preclude  
11 development of any unforeseen circumstances.

12           Once assurance is present, if there is no  
13 potential hazard to the public health, GPU Nuclear  
14 management must decide what still must be done concerning  
15 further cleanup of the small amount of contamination  
16 remaining, should it continue to proceed vigorously  
17 spending additional tens of millions of dollars to improve  
18 the condition of the reactor basement building and other  
19 areas beyond the end point levels projected in the  
20 licensing documents.

21           If it were the intention of GPU Nuclear  
22 Management to use the containment building for another  
23 energy producing facility sometime in the future, then  
24 there would be valid reasons to continue to reduce the  
25 radiation level in the remaining more radioactive areas.

1           Since the radioactivity is in an immobilized  
2 state within the basement walls and structures, and GPU  
3 has announced as was repeated by its chairman again today,  
4 no plan is under consideration to rebuild and restart  
5 TMI-2; there appears to be no rationale basis to continue  
6 to subject workers to unnecessary radiation exposure  
7 beyond that currently needed to remove the damaged fuel.

8           The most responsible plan would be to slow down  
9 the cleanup operation considerably, to be even more  
10 protective of the health and safety of workers as well as  
11 the public than in the past and use this prolonged  
12 duration of time for additional natural decay of the  
13 remaining radioactivity, some of which will essentially  
14 disappear.

15           When the time comes to decommission the TMI-1  
16 plant well in the future, steps can be taken at that time  
17 to remove any remaining radioactivity in the TMI-2  
18 containment and associated buildings.

19           In the intervening years, the residual  
20 radioactivity will have been further reduced by natural  
21 decay.

22           The two principal radioactive products is  
23 cesium-137 and strontium-90 and have been decaying at the  
24 rate of two and a half percent per year, so that the  
25 radioactivity remaining after approximately 30 years will

1 have been reduced to about half of the present levels.

2           It's also anticipated that advanced robotic  
3 systems will be available that will further reduce  
4 potential exposures of workers expected in the  
5 decontamination of the TMI-2 reactor plant in preparation  
6 to decommission the facility.

7           Now this statement, Mr. Chairman, represents a  
8 consensus statement by all members of the TMI-2 Safety  
9 Advisory Boards, their names and backgrounds are included  
10 in Attachment A.

11           Now before concluding my statement, let me say a  
12 word about GPU Nuclear management as we have observed it  
13 from the safety perspective.

14           GPU Nuclear has made remarkable progress in both  
15 its engineering and work performance capabilities. It has  
16 proved itself to be an unusually capable organization and  
17 one of high integrity.

18           GPU Nuclear has tackled the cleanup effort with  
19 great vigor, and it has demonstrated to the world that the  
20 cleanup could be accomplished without release of  
21 radioactive products to the public, the only exception  
22 again being the controlled release of krypton during the  
23 early phase of the cleanup.

24           As entrance to PDMS has initiated, GPU Nuclear  
25 leaves behind a remarkable legacy of engineering

1 excellence in performing this cleanup task.

2 Thank you, Mr. Chairman.

3 CHAIRMAN ZECH: Thank you very much.

4 MR. CLARK: Mr. Chairman, I might just simply  
5 summarize what we've tried to present to you today by  
6 saying we believe the end of the cleanup program is in  
7 sight, that agreement on what constitutes PDMS i.e., the  
8 final detailing of the remaining work that is extremely  
9 important so that we can be able to do it, and that  
10 Dr. Marston has today highlighted one of the key elements  
11 underlying the idea to go into PDMS and that is the  
12 principle that there is from a public health and safety  
13 standpoint to decontaminate further now as opposed to  
14 allowing decay and development to occur and to complete  
15 the decontamination later in conjunction with  
16 decommissioning.

17 CHAIRMAN ZECH: All right. Thank you very much.  
18 Questions my fellow Commissioners? Commissioner Roberts?

19 COMMISSIONER ROBERTS: I have no questions. Dr.  
20 Marston has a mellifluous voice, it makes me homesick.

21 CHAIRMAN ZECH: Commissioner Bernthal?

22 COMMISSIONER BERNTHAL: I'll never miss someone  
23 when someone's speaking that foreign dialect to you.

24 COMMISSIONER ROBERTS: Well, now I have Bill  
25 Parler, the cultured gentleman from South Carolina.

1                   COMMISSIONER BERNTHAL: I have only two  
2 questions. One I'm not sure you can address here, but  
3 I'll try anyway.

4                   Where do we stand on this business of  
5 evaporation? I gather the hearings are proceeding. The  
6 later question, of course.

7                   MR. KINTNER: Well as I said, there has been the  
8 discovery process underway, it is not yet completed.  
9 Hearings themselves will be started we believe in June and  
10 we think the process will come back to you by the end of  
11 the year, some recommendation from the Board.

12                  COMMISSIONER BERNTHAL: All right. I guess  
13 that's about as far as we can go right now.

14                  The other question is money. I would like to  
15 have somebody speak to me about money if you can, that is  
16 the money available particularly as you understand it from  
17 your viewpoint, now not from any government agency's  
18 viewpoint, as to the funds to do the research that ought  
19 to be done in studying the lower head and the degree  
20 associated with that.

21                  MR. KINTNER: Well Dr. Beckjord is here, and I  
22 think he has the very latest information. My information  
23 is there is something now total from all sources including  
24 European sources to about \$3 million available to do that  
25 work. He'll have to speak for himself.



1           I would think that with as much background and  
2   preparations already existing in terms of people being  
3   there and the equipment development, that this is going to  
4   come very close to do the job properly. But maybe you'd  
5   like to ask --

6           MR. CLARK: I might just add, Fred, that from our  
7   standpoint we have been working with your Staff and I  
8   believe cooperating fully and making available access to  
9   try and work out schedule arrangements to allow them to  
10  get the needed information.

11           I think looking back to last year when this  
12  question appeared to be headed nowhere, I think it clearly  
13  looks much much better and appears to us to be headed on a  
14  very safe path.

15           CHAIRMAN ZECH: Last year at this time, we'd  
16  hoped that the Department of Energy would come through  
17  with a few more dollars, they had spent a lot of money I  
18  know on it. As it turned out, the Nuclear Regulatory  
19  Commission research program is spending some money on  
20  this.

21           Maybe Mr. Beckjord would like to give us a brief  
22  resume. And identify yourself for the reporter, please,  
23  Eric.

24           MR. BECKJORD: Yes, I'm Eric Beckjord, Director  
25  of the Office of Research.

1           Our expectation is that the reactor vessel bottom  
2 head investigation will cost about \$7 million including  
3 the gathering of the samples and the examination -- the  
4 laboratory examination and the conclusion.

5           Now I should say that the total cost may be  
6 somewhat more than that because I expect there will be  
7 international cooperation, some of which would be  
8 contributed at no cost to us, but the cost that I refer to  
9 is the total cost of gathering the sample and the  
10 examination work to be performed in this country. As I  
11 said, about \$7 million.

12           We have asked the Organization of European -- the  
13 OECD states to join in this effort with us, and the usual  
14 basis for the agreements through the Nuclear Energy Agency  
15 which is part of OECD is that the host country provides 50  
16 percent of the research funds.

17           And so we have gone to them on that basis that we  
18 would ask for the balance of 50 percent from the member  
19 states totally about \$3.5 million.

20           I was in Paris last week to make our third  
21 presentation on this project there. There was gathered  
22 the experts on pressure vessel questions from all of the  
23 EOCED states or all of the Nuclear Energy Agency states.

24           And there is very high interest in this project  
25 I'm sure of that particularly when we indicated that our

1 plan is to -- after we've cut these bolt samples from the  
2 vessel, we think that they can be divided in half and we  
3 would do half of the investigation in this country, in the  
4 U.S. for certain, possibly making available the other  
5 halves of the samples for investigation and examination in  
6 laboratories in Europe and in Japan. That was the point  
7 at which it was clear that everyone was extremely  
8 interested in pursuing the project.

9 As a result of that meeting, I'm very encouraged  
10 that we will -- that we've got a very good chance of  
11 getting a subscription for the total amount that we have  
12 asked.

13 CHAIRMAN ZECH: All right. Thank you.

14 COMMISSIONER BERNTHAL: Well I certainly hope so.  
15 I know that the Chairman and all of us have been disturbed  
16 a little I guess from time to time about the question of  
17 availability of funds. I would make the point with you  
18 Dr. Marston, you have had a very distinguished panel of  
19 people, many of whom have experience in the research area  
20 including yourself, and I would just ask that if at any  
21 point in this process in your panel's judgment we are  
22 about to lose important research information that might  
23 otherwise be available, that you would step forward and  
24 speak clearly and forcefully on that so you're heard all  
25 the way down to Washington where it needs to be heard, and

1 then of course I would hope all of you associated with GPU  
2 would do the same.

3 This is terribly important research because it's  
4 the only example really we have of a core melt accident,  
5 arrested core melt perhaps, and therefore invaluable I  
6 think, and we simply can't afford to let this opportunity  
7 slip away.

8 That's all I have to say. Thank you very much.

9 CHAIRMAN ZECH: Commissioner Carr?

10 COMMISSIONER CARR: Yes, I just had one curiosity  
11 question. I read some trade magazine the other day about  
12 a machine that was supposed to generate ice crystals for  
13 decontamination against walls and surfaces. Have you seen  
14 anything or read anything about that or tried to use one?  
15 It sounds much more effective than water.

16 MR. STANDERFER: I haven't seen that.

17 COMMISSIONER CARR: Okay. If I can find it, I'll  
18 send it to you.

19 MR. CLARK: We'll go look. I think we are  
20 interested in anything that would do it better.

21 CHAIRMAN ZECH: Commissioner Rogers?

22 COMMISSIONER ROGERS: Well just to reinforce what  
23 Commissioner Bernthal said, I hope that everything will be  
24 done that can be done to identify as much as possible the  
25 materials' properties that have developed during this

1 event in the pressure vessel, and that you know by the  
2 time you're finished where the highest thermal stresses  
3 were and what the characteristics of the materials were in  
4 those areas because it is terribly important information  
5 and unique.

6 Have you started on your decommissioning  
7 dismantlement program plan for the final disposition of  
8 this site?

9 MR. CLARK: No, we haven't. We've been basically  
10 consumed with the cleanup. I think we're looking for the  
11 final decommissioning rule. We really are not expecting  
12 to decommission. At least as we look ahead now, our  
13 expectation would be we would not decommission it until  
14 TMI-1 would be decommissioned which is a good way from us.  
15 So we really have not studied decommissioning or developed  
16 a plan at this point.

17 COMMISSIONER ROGERS: I see. All right. Thank  
18 you.

19 CHAIRMAN ZECH: Are there any remaining technical  
20 problems that you see to be resolved as far as the cleanup  
21 is concerned?

22 MR. KINTNER: Well until we get through with this  
23 core support assembly cleaning the way we've described,  
24 that's a technical issue that's still unresolved, but we  
25 think with two different techniques very well developed,

1 we are going to be able to do that. As Frank said it's  
2 going a little more for slowly than we'd like, but  
3 nevertheless we really believe we are going to be able to  
4 do that.

5           The only other area of problems from a  
6 development point of view are areas like the pressurizer.  
7 He mentioned we tried to defuel the pressurizer by  
8 vacuuming and that worked up to a point, and then we found  
9 there were clumps of what looked like resolidified clay  
10 material, so we've developed, if you'll pardon the  
11 expression, a small submarine to go down there pick up  
12 these pieces and bring them out. I don't -- Frank, that's  
13 about what you use now?

14           MR. STANDERFER: Yes. In fact it's been well  
15 tested.

16           MR. KINTNER: But not yet used in the  
17 pressurizer. But I don't think there's any fundamental  
18 technical issue remaining so long as we do complete the  
19 project essentially along the lines that we've proposed.

20           CHAIRMAN ZECH: Okay. How about -- are there any  
21 technical --

22           MR. CLARK: Mr. Chairman, could I add a little  
23 bit to that?

24           CHAIRMAN ZECH: Yes, go ahead.

25           MR. CLARK: We have to cut out radially through

1 the core former walls and remove the fuel that's out  
2 there, so that's something we haven't tried. We don't see  
3 a fundamental problem.

4 Also I guess if we ran into material fused to the  
5 bottom head -- let's ask Frank. Are we fully ready to  
6 deal with that? I don't know.

7 MR. STANDERFER: Well, no. We don't know how we  
8 would approach that if there's fused material. We'd have  
9 to see it first. And of course, as mentioned in earlier  
10 meetings, we have to be careful as we defuel a bottom head  
11 so that if there are weak spots, that we don't result in  
12 any leakage from the bottom reactor vessel in this  
13 process. So that's going to be a careful defueling step  
14 there.

15 CHAIRMAN ZECH: How about in the -- any technical  
16 problems you see in the long-term storage plan at all?

17 MR. KINTNER: I don't believe so. The normal  
18 monitoring kind of instrumentation will be available and  
19 essentially the plant will be as we've said, it will be  
20 dry, there will be no possibility of criticality, and it  
21 will be sealed to the point where distribution of activity  
22 outside the boundary is extremely unlikely.

23 MR. STANDERFER: It is not much different than  
24 some of the shut down Department of Energy production  
25 facilities that have been used on an interim basis.

1           CHAIRMAN ZECH: All right. Fine. Did you say  
2 that by 1988 by the end of this year that you'll have 99  
3 percent of the fuel removed, is that --

4           MR. KINTNER: In canisters. That's correct.

5           CHAIRMAN ZECH: What will remain after that as  
6 far as the total defueling operation?

7           MR. KINTNER: There are areas of fuel deposition  
8 which are almost impossible to get to: Cracks, crannies,  
9 and so forth. Some is tightly adherent film. In various  
10 places a large number of square feet of surface area in  
11 steam generators are films on those.

12           The removal of that from the system would require  
13 a totally new technology for decontamination, a chemical  
14 cleaning of some sort, and we do not propose to do that.

15           But the material remaining will be of that kind.  
16 It will be in places where it is either tightly adhered or  
17 will be in nooks and crannies that's almost impossible to  
18 get out by any normal mechanical means

19           CHAIRMAN ZECH: When do you intend to declare the  
20 defueling project completed?

21           MR. KINTNER: The criterion we have established  
22 for defueling has been -- first of all we are going to get  
23 all that we can practically get out.

24           Second, we want to be absolutely sure there's no  
25 possibility of any criticality under any circumstances.



1 That is there's no critical mass anywhere and no  
2 combination of masses from various parts of the system  
3 which could conceivably get together to be a critical  
4 mass.

5 So that's the criterion. We think that's  
6 something under 400 kilograms total. We really hope and  
7 believe we're going to be able to do better than that.

8 MR. CLARK: But that's kind of the nominal  
9 number, Mr. Chairman. Several hundred kilograms of  
10 fueling material and films and little --

11 CHAIRMAN ZECH: Little be remaining that's about  
12 as --

13 MR. CLARK: -- places in the plant, some few  
14 hundred kg.

15 CHAIRMAN ZECH: Okay. I was impressed by your  
16 projected manrem dose -- I think you said 6,000 manrems is  
17 what you projected compared to estimates of 13,000 to  
18 46,000.

19 MR. KINTNER: That's correct.

20 CHAIRMAN ZECH: That's certainly is a commendable  
21 achievement. You modestly stated that that was due to  
22 good fortune as well as to good work and I suppose that's  
23 right, but I would like to say that it's an awful lot of  
24 good work involved in that, an awful lot of engineering  
25 practice that's in planning.

1           We'll always -- all of us accept all the good  
2   fortune we can, but I'm impressed by the fact that that  
3   was a great achievement.

4           MR. KINTNER:   At various times we've had help  
5   from the Safety Advisory Board.   If you'll notice, three  
6   members of that Board are truly world experts in this  
7   area, and from time to time they've held our hands in  
8   those matters, if you'll pardon me saying that.

9           CHAIRMAN ZECH:   Well, however it was achieved, by  
10   a team effort or whatever, I'm sure there's a lot of fine  
11   folks involved, but it's certainly is a commendable  
12   achievement and that's my point.

13           I know that you mentioned too the NRC people have  
14   been in the leadership role up there -- and I see Dr.  
15   Travers in the audience, and also Dr. Snyder over here too  
16   and you've mentioned them -- and I too would like to  
17   commend them on the part of the entire Commission for  
18   their efforts.   I think that it has been something -- a  
19   very difficult effort that GPU Nuclear of course is taking  
20   the lead in, can take a great deal of credit for, but I'm  
21   pleased to note your recognition of the NRC people that  
22   were involved too and to commend them myself on behalf of  
23   the Commission for their efforts in order to achieve the  
24   results that we've achieved to date.

25           I guess finally I'd like to say to GPU Nuclear,

1 you've -- the whole organization, GPU, has been through an  
2 awful lot in TMI days and we've discussed many of the  
3 other issues at this table, not only this Commission but  
4 previous commissions.

5           So I think it's something here at this particular  
6 very important cleanup project that we're talking about  
7 and eventual storage, I would just like to say that your  
8 initiatives in the recent months and years in this  
9 particular effort has been a very commendable effort and  
10 you've done a -- we're not done yet, but you've had an  
11 awful lot of fine people we've alluded to briefly here  
12 today, some of you are sitting right here, but you've also  
13 taken it on in what I think is a very responsible manner,  
14 and it's important as Commissioner Bernthal and others  
15 have pointed out here today to me and to the entire  
16 Commission that we not only finish the cleanup right that  
17 you're involved in, but that we do indeed get the research  
18 value that we can from this tragic accident.

19           We might as well learn what we can from it, and  
20 we should. We have an obligation to do that. That's why  
21 this Commission has dipped into our own research funds  
22 where they're not very big, but it's so important, I think  
23 we would be completely irresponsible not to make sure that  
24 we get all we can and we learn all we can from especially  
25 the bottom of the vessel where you're working right now.

1           So we are very interested in following through on  
2 this and making sure that we do learn what we can about  
3 this.

4           There's many other applications that you're well  
5 aware of about the vessel itself and that we might gain  
6 important knowledge from this accident.

7           So we want to follow through in the research  
8 aspect of it too, and I know you're also interested in  
9 assisting in that regard as well as the entire cleanup  
10 operation.

11           But let me just say again, I think you've taken  
12 on a technical challenge here, and certainly to date  
13 you've shown a very responsible achievement, and for that  
14 I think all of us here look to that as a very professional  
15 piece of work.

16           Knowing we are not finished, but we look forward  
17 to working with you and making sure we do finish up, not  
18 only the cleanup but the research work and get what we can  
19 from it.

20           I think the public, health, and safety will be  
21 served by this, and we have an obligation to get  
22 everything we can from this endeavor that you're obviously  
23 working so hard at right now.

24           So I commend all of you for the specific  
25 achievements that you're doing during the cleanup

1 operations and the responsible way you're handling this  
2 very important project.

3 Are there any other comments? If not, then we --

4 MR. KUHNS: Mr. Chairman, let me just say we  
5 accept those comments gratefully, but less in the sense of  
6 gratification than it is a challenge to keep up the work.

7 CHAIRMAN ZECH: Good.

8 MR. KUHNS: As someone wiser than I said one  
9 time, it isn't over until it's over.

10 CHAIRMAN ZECH: You're right. We'll all not  
11 forget that.

12 With that we'll stand adjourned.

13 MR. KUHNS: Thank you.

14 [Whereupon at 3:20 p.m., the meeting was  
15 adjourned.]

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1  
2 REPORTER'S CERTIFICATE  
3

4 This is to certify that the attached events of a  
5 meeting of the U.S. Nuclear Regulatory Commission entitled:  
6

7 TITLE OF MEETING: Briefing on Status of TMI-2

8 PLACE OF MEETING: Washington, D.C.

9 DATE OF MEETING: Thursday, March 17, 1988  
10

11 were held as herein appears, and that this is the original  
12 transcript thereof for the file of the Commission taken  
13 stenographically by me, thereafter reduced to typewriting by  
14 me or under the direction of the court reporting company, and  
15 that the transcript is a true and accurate record of the  
16 foregoing events.  
17

18   
----- Mario Rodriguez -----  
19  
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22 Ann Riley & Associates, Ltd.  
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3/17/88

SCHEDULING NOTES

TITLE: BRIEFING ON STATUS OF TMI-2

SCHEDULED: 2:00 P.M., THURSDAY, MARCH 17, 1988 (OPEN)

DURATION: APPROX 1-1/2 HRS

PARTICIPANTS:

- WILLIAM G. KUHNS CHAIRMAN OF THE BOARD AND CEO OF GPU	5 MINS
- PHILLIP R. CLARK, PRESIDENT GPUN CORPORATION	10 MINS
- EDWIN E. KINTNER EXECUTIVE VICE PRESIDENT OF GPUN CORPORATION	5 MINS
- FRANKLIN R. STANDERFER DIRECTOR AND VICE PRESIDENT, TMI-2	15 MINS
- ROBERT Q. MARSTON, CHAIRMAN TMI-2 SAFETY ADVISORY BOARD	5 MINS