

Docket No. 50-289  
(Restart)

10 Thursday, April 2, 1981

11                   Evidentiary hearing in the above-entitled  
12 matter was resumed, pursuant to adjournment, at 9:00 a.m.

### 13 BEFORE:

14 IVAN W. SMITH, Esq., Chairman,  
Atomic Safety and Licensing Board

DR. WALTER H. JORDAN, Member

DR. LINDA W. LITTLE, Member

17

Also present on behalf of the Board:

Also present on behalf of the Board:

MS. DORIS MORAN,  
Chair to the Board

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## 1 APPEARANCES:

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29 JOHN MURDOCK  
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## C O N T E N T S

		<u>DIRECT</u>	<u>CROSS</u>	<u>REDIRECT</u>	<u>RE CROSS</u>	<u>BOARD</u>	<u>CROSS ON BOARD</u>
1	<u>WITNESS:</u>						
2							
3							
4	James Curry and						
5	Jared Wermiel (Resumed)						
6	By Dr. Jordan					17,064	
7	By Mr. Dornside					17,093	
8	By Mr. Baxter					17,096	
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20							
21	Written Testimony of Dr. Dynes-----page 17,120						
22							
23							
24							
25							

## 1 PROCEEDINGS

2 (9:02 p.m.)

3 CHAIRMAN SMITH: Is there any preliminary business?

4 (No response.)

5 Whereupon,

6 JAMES CURRY

7 AND

8 JARED WERMIEL

9 resumed the stand and were further examined and testified as  
10 follows:

## 11 BOARD EXAMINATION

12 BY DR. JORDAN:

13 Q I have first a question or two for Mr. Wermiel. In  
14 what respects to the Westinghouse and Combustion plants,  
15 particularly the Westinghouse plants, differ in protecting  
16 against loss of main feedwater as compared with B&W plants?17 A (WITNESS WERMIEL) There is no basic difference,  
18 Dr. Jordan. Westinghouse plants all have auxiliary or  
19 emergency feedwater systems designed to mitigate a feedwater  
20 transient. Some of them also have a backup feed and bleed  
21 capability similar to the B&W plants. Some of them do not.22 Q I see, yes. Now, in those that do not do you  
23 require a higher standard of reliability in the feed and  
24 bleed system? I mean, the higher standard of reliability in  
25 the emergency feedwater system?

1       A     (WITNESS WERMIEL) No, sir. We apply the same  
2 deterministic criteria to the auxiliary feedwater system in  
3 all plants.

4       Q     I see. No matter how low the reliability is, if it  
5 is redundant and meets safety grade, that is all that is  
6 required.

7       A     (WITNESS WERMIEL) Yes, sir. We have not as yet  
8 used a number, a numerical goal for reliability as a basis  
9 for determining the plant safety with respect to mitigating  
10 feedwater transients or other accidents.

11      Q     Is the Staff comfortable with this position with  
12 respect, say, to Westinghouse plants that do not have backup  
13 capability? Are they doing anything about it? Are they  
14 going to continue to rely on emergency feedwater systems  
15 which do not demonstrate a high reliability?

16      A     (WITNESS WERMIEL) We are now looking at multiple  
17 failures, as I believe Frank Rowsome said yesterday, with  
18 respect to certain scenarios with an end of core damage to  
19 see where our deterministic criteria may have shortcomings  
20 and where we may have not identified all the potential  
21 problems that could be present in these systems.

22           And I know that the Commission has a plan for  
23 developing numerical safety goals. I do not know what the  
24 details of that plan are or the status of it, but serious  
25 consideration is being given to this because I think we are

1 now recognizing other factors that are not necessarily being  
2 included in our current practice, particularly with respect  
3 to the potential for human error and the human interaction,  
4 because the deterministic criteria that we generally apply,  
5 at least in my branch, have not really considered the human  
6 in the past.

7 Q And by considering the human, of course you mean  
8 the possibility that a human will, say, disable all of the  
9 redundant paths.

10 A (WITNESS WERMIEL) Yes. And further, what is his  
11 capability to recover if he has made an error, what is the  
12 time frame and what are the consequences, and further, what  
13 interaction or what additional systems could back him up or  
14 could give him additional protection from his mistake while  
15 he is attempting to correct it.

16 Q We explored a little bit yesterday a question of --  
17 well, before I get to that there is another question I have  
18 on page 17, I believe. Do you have that?

.19 A (WITNESS WERMIEL) I have page 17, yes, sir.

20 Q Under the section roman numeral II.A.1, the plant  
21 specific reliability analysis, there is a comment, and I  
22 will read the entire comment. "At NRC's request B&W  
23 performed a two-part EFW system reliability evaluation.  
24 Part I (BAW-1584) was generic for all B&W operating plant  
25 EFW systems. Part II was specific to TMI-1. A relative

1 reliability ranking against other B&W plants was  
2 established, and dominant sources of EFW system  
3 unreliability were identified. The NRC probabilistic  
4 analysis staff reviewed and concurred with this evaluation  
5 (draft report available.)"

6           This draft report is still unpublished?

7       A    (WITNESS WERMIEL) That is correct. It is my  
8 understanding -- and Jim Curry can correct me on this --  
9 that it will eventually be documented in a NUREG.

10      Q     Is that correct, Mr. Curry?

11      A    (WITNESS CURRY) Yes. We are currently working on  
12 documenting our conclusions based on our review of the B&W  
13 report in that NUREG.

14      Q     Can you tell me some of the important conclusions  
15 that you arrive at in this draft report?

16      A    (WITNESS CURRY) Well, in terms of unreliabilities  
17 of systems in general, basic conclusions that we found in  
18 this report are very similar to those found in 0611 and  
19 0635. Contributions of human errors and common mode  
20 failures were often found to dominate the unreliability of  
21 the system.

22           As I tried to point out in the Attachment 3 that I  
23 had submitted earlier to my testimony, we do recognize the  
24 fact that using the -- on the surface apparently success  
25 criterion EFWS operation to prevent steam generator dryout

1 may limit the ultimate reliability of the EFWS system using  
2 that success criterion. However, we did use that success  
3 criterion for the NUREG simply for the purposes of being  
4 consistent with other NUREGs that we did use. However, as I  
5 said, it is a slightly more severe criterion for the B&W  
6 plants.

7 Q According to this criteria then, you do find that  
8 B&W plants are somewhat either less reliable or subject to  
9 more frequent challenges. Is it one or the other or both?

10 A (WITNESS CURRY) Well, it is not a question of  
11 challenge, but if one were interested in the question of  
12 preventing steam generator dryout because it occurs so much  
13 earlier in B&W steam generators, the chances of securing flow  
14 from an auxiliary feedwater system associated with such a  
15 generator one might expect to be less than if one had a  
16 greater amount of time to secure that same flow as you do in  
17 some of the bigger steam generators.

18 Q Do you think that if you had used a 20-minute  
19 criteria for B&W you would have come out with the same  
20 numbers?

21 A (WITNESS CURRY) As we did for the other utilities?

22 Q Yes.

23 A (WITNESS CURRY) I think that is a very germane  
24 question, and I think that the results would have been more  
25 comparable. There is no reason for me to suspect that B&W

1 auxiliary feedwater designs per se are any less reliable  
2 than other designs.

3 Q I see. That is what I was getting at. And no more  
4 subject to common mode failure or human error failure.

5 A (WITNESS CURRY) Not at first glance. There is no  
6 reason to suspect that, with the exception, of course, is as  
7 I described earlier, and that is, we are very cautious about  
8 the interaction of the integrated control system with the  
9 auxiliary feedwater system design, and consequently are  
10 supportive of the idea of ultimately backing up that ICS  
11 interaction with a separate control system which separately  
12 controls each of the EFWS trains.

13 Q Perhaps it would be well for me to explore just a  
14 bit then, because I noticed on this page 17 the item, you  
15 have this comment also. "This failure mode will be  
16 eliminated by implementation of safety grade EFW  
17 autoinitiation," which I presume is what you were just  
18 referring to.

19 A (WITNESS CURRY) If the question is to me, yes.  
20 The common mode will be eliminated, not by the definition of  
21 safety grade but because safety grade implies separation  
22 between the actuation of the different trains.

23 Q So you really meant that a particular common mode  
24 failure induced by the ICS will be what will be eliminated.

25 A (WITNESS CURRY) Yes. If you look under the item A

1 to the left of that comment, that refers to the failure in  
2 the ICS which prevents opening up both EFW flow control  
3 valves.

4 Q All right. Now, review for me then briefly upon  
5 the event of either a failure of the ICS system or a loss of  
6 main feedwater transient is there an automatic switch to  
7 safety grade control in either event?

8 A (WITNESS WERMIEL) If I have a feedwater transient  
9 either caused by an ICS failure or for some other reason,  
10 and ICS has failed in a manner where the flow control valves  
11 have not opened, then the operator using his separate manual  
12 control valve station in the control room, it has a separate  
13 power supply and is completely divorced of the ICS system.  
14 He may utilize this station to open the flow control valves  
15 and admit water to the steam generator.

16 Q Is this the long term?

17 A (WITNESS WERMIEL) No.

18 Q This is the short term?

19 A (WITNESS WERMIEL) That is a restart. In the long  
20 term --

21 Q I am sorry. I was inquiring about what you propose  
22 in the long term.

23 A (WITNESS WERMIEL) In the long term what would  
24 happen is he would -- there would be no interconnection with  
25 ICS at all. If ICS failed and caused a feedwater transient

1 or you had a feedwater transient for some other reason, the  
2 pumps would automatically be initiated.

3 Q I see.

4 A (WITNESS WERMIEL) And the valves would open and be  
5 throttled based on the level in the steam generator.

6 Q So that the emergency feedwater system will be  
7 disconnected entirely from the ICS.

8 A (WITNESS WERMIEL) That is correct, sir.

9 (Panel of witnesses conferring.)

10 Q Now, all the answers are still correct?

11 A (WITNESS WERMIEL) I believe so. That is my  
12 understanding, sir.

13 Q All right, fine.

14 A (WITNESS WERMIEL) That is my understanding.

15 Incidentally, that is the way I would want to see it.

16 Q Me, too.

17 A (WITNESS WERMIEL) That is the design I believe we,  
18 the staff, when we finally do see it are going to be looking  
19 for.

20 Q Very well. I should have asked Mr. Keaten that  
21 question very carefully, and I failed to do so; but that was  
22 my understanding as to the goal anyhow of the  
23 modifications. And if I am wrong, then I will ask either  
24 the Staff or the Licensee --

25 MR. BAXTER: My memory of Licensee's testimony last

1 fall.; Mr. Capodanno and Mr. Lanese is consistent with what  
2 Mr. Wermiel said.

3 DR. JORDAN: Fine. Thank you.

4 BY DR. JORDAN: (Resuming)

5 Q But now there are these feedwater -- these control  
6 valves then. There are pumps and valves.

7 A (WITNESS WERMIEL) Yes.

8 Q And at the moment the pumps and valves are under  
9 the control of ICS. Both the pumps and the valves will be  
10 taken away from the ICS.

11 A (WITNESS WERMIEL) Only the valves are, at the time  
12 of restart are under control.

13 Q At the time of restart, but eventually, long term.

14 A (WITNESS WERMIEL) The modification to remove the  
15 pumps from the ICS may already have been completed.

16 Q I see, yes.

17 A (WITNESS WERMIEL) I'm not positive of that, but I  
18 know they are proceeding to do that, and it may already have  
19 been done.

20 Q I see. Good.

21 A (WITNESS WERMIEL) It will be done by restart.

22 Q All right. When this draft is published that you  
23 are talking about will this mean now that -- well, am I  
24 correct, if I remember right, there was an Appendix 3 in the  
25 reviews of the Combustion and Westinghouse which did discuss

1 the reliability.

2 A (WITNESS WERMIEL) Yes, sir. On an individual  
3 plant basis, that is right.

4 Q Right now when this draft comes out will that put  
5 essentially the B&W plants equivalent to -- in the Staff  
6 review and the extensiveness of the review to the other  
7 plants?

8 A (WITNESS CURRY) The draft will attempt to describe  
9 the extensiveness of the review. There will be individual  
10 appendices to describe the reliability of individual  
11 plants. Once again, though, this is a draft which  
12 essentially describes our review of the B&W reports which  
13 were submitted in the '79 time frame, so many changes may  
14 have been implemented subsequent to our review at that time.

15 Q But one of the things that was lacking in the early  
16 report on transients in B&W plants was this Appendix 3 which  
17 was the reliability analysis, if I remember right, isn't  
18 that correct? And I was wondering if this new draft is  
19 essentially -- makes up for that lack in the old NUREG  
20 report on B&W plants? I guess it was NUREG-0580.

21 A (WITNESS CURRY) I am not sure I understood what  
22 you said was missing.

23 Q All right. The report -- there were three reports  
24 issued. You mentioned the numbers for the Westinghouse and  
25 Combustion. There was also one for the B&W, and the B&W,

1 was that the 0560?

2 A (WITNESS WERMIEL) Yes. The 0560 did not include  
3 the reliability studies for B&W plants.

4 Q Now, will this new report then correct that  
5 deficiency?

6 A (WITNESS WERMIEL) I would say yes, it would tend  
7 to make 0560 with this more comparable to NUREG-0611 and  
8 9635.

9 Q All right. That is what I was getting at. Thank  
10 you.

11 Now, your testimony here today, does it in essence  
12 describe the updated Staff analysis of the B&W plants? In  
13 other words, the things that you have told us about the  
14 reliability studies, will some of this appear in fact in  
15 this draft report that is coming up, the NUREG report?

16 A (WITNESS CURRY) Indeed, what we have described  
17 today goes beyond or -- it goes beyond what is in the NUREG  
18 report. The NUREG report that is coming out is associated  
19 largely with the Staff's estimation of the mid-1979 TMI-1  
20 EFWs design as indicated in my Attachment 3.

21 Q I see, I see.

22 A (WITNESS CURRY) Just to add a point of  
23 clarification, more or less as a direct response to the  
24 Board's question about the system reliability at restart or  
25 what it would be eventually, additional analysis was done to

1 come up with more current estimates of its reliability.

2 Q I see.

3 (Pause.)

4 CHAIRMAN SMITH: Mr. Baxter, I note that you have  
5 provided a clean copy of UCS Exhibit 32. Have you provided  
6 it to the Reporter?

7 MR. BAXTER: Yes, sir.

8 CHAIRMAN SMITH: Thank you.

9 BY DR. JORDAN: (Resuming)

10 Q I would like to turn to Mr. Wermiel's -- no, the  
11 figure on the comparative reliability, Mr. Curry's figure,  
12 which we discussed yesterday, and here I have it. Pages 35  
13 and 37, wasn't it?

14 (Pause.)

15 Can you tell me why it is that the Westinghouse  
16 plants have apparently about an order of magnitude higher  
17 reliability than the B&W or the TMI, in fact, plant even  
18 after the modifications?

19 A (WITNESS CURRY) Well, again, I think that is a  
20 function of the success criterion that was adopted for this  
21 study. We used steam generator dryout and the probability  
22 of securing successful flow to prevent that as the success  
23 criterion for all of the plants analyzed.

24 As it turns out, such an occurrence occurs much  
25 earlier after a loss of main feedwater in B&W plants than it

1 does in Westinghouse plants. So when one is estimating the  
2 numbers, one can give much more credit for operator recovery  
3 action in approximately 30 minutes than otherwise.

4 Q Did B&W make estimates for the five-minute estimate  
5 -- number that you have used and also for other numbers that  
6 were comparable with Westinghouse dryout times?

7 A (WITNESS CURRY) B&W in their report made  
8 reliability estimates for 5, 15, and 30 minutes.

9 Q Now, in the case of the estimates for 30 minutes  
10 then or 20 minutes were the reliabilities improved by an  
11 order of magnitude?

12 A (WITNESS CURRY) Well, I would have to pull out the  
13 B&W report.

14 Q Would you do that?

15 (Witness reviewing document.)

16 A (WITNESS CURRY) This is BAW-1584, December 1979.

17 Q All right.

18 A (WITNESS CURRY) The B&W analysis did not in any  
19 case predict reliabilities as high as the best Westinghouse  
20 associated reliabilities.

21 Q So there must be more to it than just a matter of  
22 additional time.

23 A (WITNESS CURRY) Again, this is the B&W analysis.

24 Q Yes, yes. You have not tried to make any analysis  
25 yourself comparing the B&W -- well, you have done, of

1 course, the one, the TMI-1 versus the Westinghouse plants as  
2 part of your Figure 1 which we were just discussing, but you  
3 have not looked at that with, say, twenty or thirty minutes'  
4 time.

5 A (WITNESS CURRY) I did not examine the later time  
6 periods.

7 Q All right. Now, then, if you were to, how would  
8 you do it? If you were to -- suppose -- let's assume we  
9 would like to know are they really indeed similar, that it  
10 is only the time that is the difference. How would you put  
11 that into your calculations?

12 A (WITNESS CURRY) I believe that is a large reason  
13 for the difference, and the way that one would put that in  
14 the calculations is to proceed through the fault tree.

15 Q Yes.

16 A (WITNESS CURRY) To occasions where it is indicated  
17 that certain valves may not be open, for instance, and at  
18 that point one would incorporate an and gate; that is, in  
19 order to fail that valve, the valve has to be initially  
20 closed, and the operator has to fail to reopen it.

21 Q All right.

22 A (WITNESS CURRY) Such a gate is not in there in the  
23 five-minute case because no credit was given for the  
24 operator reopening it.

25 Q Now, such a gate was in there in either the

1 Westinghouse analysis or the BAW-1584 report.

2 A (WITNESS CURRY) Such a gate would exist in the  
3 Westinghouse analyses. I cannot recall -- I did not go  
4 through the fault tree line by line in the B&W report. It  
5 would -- well, I just did not go through it line by line.

6 Q Well, I guess my puzzlement is that the Staff has  
7 essentially quit at five minutes. They have faith that if  
8 they had gone to a longer time that this plant would have  
9 been as good as other plants. They also have faith  
10 apparently that that is the main reason why one can depend  
11 -- why they feel that the health and safety of the public is  
12 adequately protected because they have said -- you have said  
13 several times that the backup in your mind is the additional  
14 time that would be given -- that would be obtained by the  
15 operation of a high pressure injection system rather than  
16 the ability to recover the plant completely.

17 A (WITNESS CURRY) Well, okay, let me say something  
18 and then you.

19 A (WITNESS WERMIEL) Okay.

20 A (WITNESS CURRY) It is not that the Staff is  
21 placing the health and safety of the public on an operator  
22 recovery of the EFWS within a certain system. What I had  
23 wished to point out from my vantage point is that the risk  
24 of a plant is associated with the integrated response of the  
25 facility.

1           I chose to present the five-minute time period  
2 under the guidance that the Board wished to see numbers, and  
3 I chose the most severe case.

4           Q      We appreciate that.

5           A      (WITNESS CURRY) And simply wished to point out  
6 that not only -- that should not be given a one-to-one  
7 correspondence with plant risk as modeled by core damage.  
8 Plant risk should take into account not only the fact that  
9 successful EFWS operations will occur even if the flow is  
10 secured at a much later time or during a much longer  
11 interval, but also the fact that this plant is equipped with  
12 a feed and bleed mode of operation which can successfully  
13 cool the core.

14           And in terms of risk and in probabilities, the key  
15 question that we look at in the Office of Research is this  
16 integrated response. It is my judgment that additional  
17 credit can be given for operator recovery actions in the  
18 longer time interval.

19           A      (WITNESS WERMIEL) Dr. Jordan, I just want to point  
20 out that from a deterministic standpoint, we have applied  
21 the same criteria to all pressurized water reactor plants.

22           Q      Yes. No matter how bad the reliability of a  
23 system is. If it meets the single failure criterion, that  
24 is it.

25           A      (WITNESS WERMIEL) What we attempted and we have,

1 we believe, identified those dominant failure modes and  
2 corrected them, and corrected them in a consistent manner  
3 such that once the particular failure we have been talking  
4 about within the ICS is eliminated, there is no reason to  
5 suspect that the emergency feedwater system at TMI-1,  
6 because it has met comparable criteria to others, should be  
7 any different than in the Westinghouse and CE plants.

8           And the potential discrepancy is the mission  
9 success criteria or the potential bias that has been  
10 associated with that could have been corrected, I think, if  
11 we had come up with a more realistic mission success.

12 Instead of, say, steam generator boil dry for the first  
13 initial case, what we should have probably said, capability  
14 of emergency feedwater to deliver minimum feedwater flow for  
15 mitigating a transient, and that would have been, I think, a  
16 lot more sound basis for comparison. And I think if we had  
17 done that -- as a matter of fact, I am confident if we had  
18 done that with this modification in place, TMI-1 would have  
19 looked very similar to the other Westinghouse plants,  
20 notwithstanding the fact that some of them are four-loop as  
21 opposed to the B&W plants, and that also introduces a  
22 certain differential which I believe Mr. Curry has already  
23 alluded to.

24 Q       You mean the four steam generators.

25 A       (WITNESS WERMIEL) Four steam generators now gives

1 you four paths of flow as opposed to just two, so you have  
2 another.

3 Q By four paths do you mean four complete systems,  
4 pumps, valves, and the works?

5 A (WITNESS WERMIEL) No, sir, no.

6 Q Why is it --

7 A (WITNESS WERMIEL) If I single fail a valve in a  
8 train I now have three trains.

9 A (WITNESS CURRY) May I comment on that since that  
10 was part of my testimony?

11 Q Let me tell you for a moment what my problem is  
12 because we have been talking here about two trains and the  
13 redundancy provided by two trains, and yet there are indeed  
14 three different pumps, and it seems to me that the active  
15 components are more likely to fail than the passive  
16 components.

17 A (WITNESS WERMIEL) Surely.

18 Q Would you address that?

19 A (WITNESS CURRY) You are absolutely right. The  
20 active failures certainly are more likely than so-called  
21 passive failures. The point about additional discharge  
22 paths is the point being that failures in the discharge side  
23 will be less likely if you have more ways to get flow to a  
24 steam generator.

25 In this particular case what we indeed found was an

1 active failure on the discharge side for the old TMI-1  
2 design; that is, the normally closed feedwater control  
3 valves failing to open.

4 Q Yes, yes. But then would you say that under the  
5 projected long term that will no longer be the critical path?

6 A (WITNESS CURRY) Yes, I would say that would be  
7 removed as a dominant failure.

8 Q So we would have the advantage then of three,  
9 essentially three systems.

10 A (WITNESS CURRY) Well, it is not in my opinion a  
11 complete three-train system. Parts of it are indeed  
12 three-train in that you do have three pumps, but once again,  
13 you do eventually end up where you have to feed into just  
14 two steam generators.

15 Q I see. And so, therefore, I guess you just cannot  
16 say the redundancy is two or the redundancy is three. You  
17 have got to do an analysis such as you have done.

18 A (WITNESS CURRY) That's right. That is right. If  
19 I may add another point for perspective, I think your  
20 question about feed and bleed capacities at other plants and  
21 whether we demand reliabilities of auxiliary feedwater  
22 systems to be higher at plants that do not have that  
23 capacity is a very germane point. That is the nature of  
24 what we do in Research in recognizing the integrated  
25 approach.

1           In past licensing practices Mr. Wermiel had  
2 testified there were deterministic criteria that everyone  
3 met. There does not appear to be a strong correlation at  
4 this time between auxiliary feedwater system reliabilities  
5 and feed and bleed capabilities among plants. As it turns  
6 out, TMI-1 does have that backup feed and bleed option,  
7 however.

8           Q     Yes. Well, does this perhaps -- does it mean in  
9 your opinion that whereas prior to the accident wherein the  
10 emergency feedwater system was probably one of the more  
11 suspect -- and I am -- you can interpret that as my words or  
12 your words -- at least that it had a number of deficiencies,  
13 not being safety grade and so forth, and therefore, one  
14 might have said that the overall reliability from the  
15 standpoint of core damage was reduced compared to some of  
16 the other plants.

17           Now, would the change or the proposed change to  
18 safety grade with a backup of high pressure injection  
19 system, would it now become one of the more reliable from  
20 the standpoint of protection against core damage?

21           Is that too big a conclusion to draw?

22           A     (WITNESS CURRY) That is too big a conclusion to  
23 draw without a study of the entire plant, but that is  
24 certainly the question that should be asked, and it is  
25 certainly -- it certainly helps to have redundant systems

1 preventing core damage.

2           So if I were to compare two plants with equal EFWS  
3 reliability, however, one had the HPI backup and one did  
4 not I would suspect that the probability of core damage  
5 would be greater in the plant that did not.

6           Q      I have forgotten. Will Davis-Besse be required to  
7 change their high pressure injection system so that feed and  
8 bleed will be available? Do you happen to remember?

9           A      (WITNESS WERMIEL) I do not know whether they are  
10 going to be required to do that. I know we are aware that  
11 they do not have the high head injection pumps at this time.

12          Q      There has been in the past, and we referred to them  
13 yesterday, statements that B&W plants do experience more  
14 challenges to the emergency feedwater system than other  
15 plants, something like a factor of two; and I could read  
16 this from NUREG-0560. This now has been questioned as to  
17 whether the B&W plants really are any different.

18          Do you have any recent information that would lead  
19 us to believe that B&W plants have no more -- are no more  
20 frequently challenged than other plants?

21          (WITNESS WERMIEL) I can answer that. I believe,  
22 Dr. Jordan, as I read through a transcript from not long  
23 ago, and I believe Dr. Ross did provide some additional  
24 information in that area when he was here; but I honestly do  
25 not remember what it was he exactly said. I do remember

1 reading something about it.

2                   MR. BAXTER: My recollection of Dr. Ross' and Mr.  
3 Capra's testimony was that they had looked at the arrival  
4 rate of feedwater transients or demands on emergency  
5 feedwater -- I am not sure which -- and found that it was  
6 totally independent of NSSS vendor.

7                   DR. JORDAN: What?

8                   MR. BAXTER: Totally independent of the NSSS vendor.

9                   DR. JORDAN: Thank you very much. We will look at  
10 that again.

11                  BY DR. JORDAN: (Resuming)

12                 Q All right. Now, then, as you remember, I referred  
13 to the St. Lucie decision and the problems, and we were  
14 talking yesterday about station blackout. That was the  
15 problem at St. Lucie. The only reason that I referred to  
16 St. Lucie was because I saw a similarity.

17                 You remember in the case of St. Lucie the  
18 likelihood in that case of a loss of offsite power seemed to  
19 be more frequent than other areas, and so therefore there  
20 was a class of plants on that peninsula that seemed to be  
21 more obviously and frequently affected. And therefore, the  
22 challenge rate to the diesels was more frequent. However,  
23 the main problem was that the diesels were being relied on  
24 as being redundant systems in a deterministic evaluation,  
25 that independent of their reliability, as long as it was

1 redundant, that they met the single failure criteria.

2 Now, I believe that in that case the challenge rate  
3 was very low even though it is on a peninsula, but I have  
4 forgotten what it was. It may have been a fraction per  
5 year, and we are perhaps talking about essentially, well, if  
6 anything, higher challenge rates now to the auxiliary  
7 feedwater system than we were talking about there to the  
8 challenge rates to the diesels, at least as high. And  
9 apparently we are talking about a system whose reliability is  
10 essentially somewhat similar, if anything, at the time of  
11 restart is going to be lower, and so therefore, the question  
12 is can one really depend on the single failure criteria  
13 under the circumstances where high reliability of the  
14 individual chains in the redundant systems have not been  
15 established.

16 Now, it appears to me that at least prior to  
17 restart that the emergency feedwater system even though  
18 redundant, the reliability has not been established  
19 according to the St. Lucie criteria; and therefore, one  
20 cannot depend upon the fact that they are redundant.

21 Now, what is your response to that, and that was,  
22 as you know, my main concern.

23 A (WITNESS WERMIEL) Yes.

24 MR. BAXTER: Dr. Jordan, I feel I have to take some  
25 exception to your description of the record so far.

1 DR. JORDAN: Very well.

2 MR. BAXTER: The St. Lucie analysis by the Appeal  
3 Board showed that the challenge rate based on loss of  
4 offsite power frequency was between .1 and 1 per year.

5 DR. JORDAN: How much?

6 MR. BAXTER: Between .1 and 1 per year.

7 DR. JORDAN: Something very similar to what we have  
8 here.

9 MR. BAXTER: We have at least some evidence in this  
10 record that the loss of main feedwater frequency for BCP  
11 plants is 0.3.

12 DR. JORDAN: Essentially the same then, somewhere  
13 between .1 and 10. That is really what I was saying.

14 MR. BAXTER: I thought you said we have a challenge  
15 rate that is greater.

16 DR. JORDAN: No, no. Essentially the same. I am  
17 willing to say essentially the same, because I do not think  
18 it matters.

19 BY DR. JORDAN: (Resuming)

20 Q And so, therefore, can one depend on redundant  
21 systems whose reliability has not been demonstrated to be  
22 high?

23 A (WITNESS WERMIEL) For one thing, Dr. Jordan, we  
24 have the redundant emergency feedwater system, and that is  
25 backed up by an additional system for the case we are

1 referring to.

2 Q I agree that that is the situation, but the staff  
3 apparently does not take it into account.

4 A (WITNESS WERMIEL) I thought the record here  
5 indicated that we were taking it into account.

6 Q Well, at least you do not take it --

7 A (WITNESS WERMIEL) Recognizing that it is there.

8 Q You recognize it is there, but --

9 A (WITNESS WERMIEL) And we get --

10 Q But does it give you -- does that -- do you have  
11 any reason for believing that that system will give you an  
12 overall protection for the core which is, well, high like  
13 the order -- we do not have numbers goals yet established,  
14 but we all have numbers in mind. So do you -- what is your  
15 response?

16 A (WITNESS WERMIEL) For an interim time period we do  
17 feel it provides us some additional reliability for  
18 prevention of core damage, and then we have a recovery  
19 capability to gain emergency feedwater back or main  
20 feedwater, and this -- a similar argument was presented, I  
21 believe in ALAB-603 for a time period to recover either the  
22 diesels or the offsite power grid.

23 Q Yes, but in that case I believe they were told to  
24 make an analysis to demonstrate that that recovery period  
25 would indeed suffice to give overall protection. Here I

1 have not seen any such analysis that the overall protection  
2 afforded by the extra recovery time such as they have  
3 exactly in St. Lucie, that in that case the emergency  
4 feedwater system provided extra recovery time. And they  
5 were told by the time of licensing that they must  
6 demonstrate that that did indeed accomplish the job.

7 A (WITNESS WERMIEL) Okay. We have identified the  
8 20-minute period for a total loss of feedwater as one  
9 criteria that has been analyzed. But you are correct, we  
10 have not looked at the total time period which we can rely  
11 on the feed and bleed mode. We have not fixed that; that is  
12 correct. But that will extend that time period, to what I  
13 do not know. I am not sure -- and I know we do not know by  
14 analysis that is correct.

15 A (WITNESS CURRY) May I add a point?

16 Q Please do.

17 A (WITNESS CURRY) The question about goals,  
18 reliability goals for a plant, the Commission is moving  
19 toward numerical goals or has given some thought to  
20 numerical goals which relate to probabilities of core damage.

21 Those goals were presented in the Check-Rosenthal  
22 testimony which I thought germane. I brought a copy of the  
23 testimony, because I thought it integrally tied with the  
24 point we were discussing here. And that testimony describes  
25 the goals the Commission is thinking about now in terms of

1 core damage probability. That relates to EFWS reliability  
2 from the standpoint, or at least I make the conclusion that  
3 this system would be acceptable for operation given my  
4 knowledge of reliability analyses of other plants which turn  
5 up core melt probabilities within a certain range. And I  
6 envision the role of EFWS as part of a sequence that would  
7 lead to core melt probabilities.

8 Q It seems to me now you are really addressing my  
9 most central concern, and I guess I invite you to expand on  
10 it.

11 A (WITNESS CURRY) Okay.

12 Q Tell us more about the report, and this is essentially  
13 is where I am going and where I am ending, so please do that.

14 A (WITNESS CURRY) Fine. And the key point that my  
15 judgment is based on is that knowledge of EFWS reliability  
16 and knowledge that it lies within a certain range, knowledge  
17 that there is an additional system reliability to be  
18 considered given that both systems have to fail, in my  
19 estimation provides a sequence which would lead to core  
20 damage with the probability likely to be less than or  
21 certainly no greater than other sequences in all operating  
22 plants that I am aware of.

23 My knowledge of those sequences and their  
24 probabilities is based on the studies that Mr. Rowsome had  
25 talked about. Of course, previously we have licensed on

1 what were considered good engineering principles. Today we  
2 are in the mode where we are simply trying to quantify what  
3 exactly those principles have bought us.

4           The techniques that we use proceed in a rigorous  
5 manner and often allow us to see things that were overlooked  
6 by those broad-based principles.

7           Just as point of information then, it was page 27  
8 of the Check-Rosenthal testimony in response to UCS  
9 Contention XIII which provides some insight to the  
10 Commission's current thought on numerical goals for  
11 probabilities of core damage.

12          Q      I do not think I have that with me. That was  
13 introduced in the testimony earlier, is that correct?

14          A      (WITNESS CURRY) Yes, that is part of the  
15 testimony. I do not have a date on this. I can give you  
16 this.

17          Q      Staff does not usually date their testimony.

18           Now, would you refer me -- I have now Mr.  
19 Rosenthal's testimony, Mr. Rosenthal and Check, relative to  
20 UCS Contention XIII now in front of me, and would you refer  
21 me to the section that you were --

22          A      (WITNESS CURRY) Page 27 of that testimony gives  
23 some insight into the Comission's current thought in the  
24 area.

25          Q      Ah, yes, now I do remember that. Right. So that

-4

1 you would say that if it is in the region of 10 to  
2 -5 -5  
3 10 , less than 10 , no action. Are you saying in your  
4 -4  
5 opinion that you believe it is now in the range of 10 , to  
6 -5  
7 10 or will be at restart, and that the corrections will  
8 put it into the place?

9 A (WITNESS CURRY) Well, again, this is -- this  
10 -4 -5  
11 range, 10 , 10 talks about probabilities of sequences.

12 Q Oh, yes.

13 A (WITNESS CURRY) Now, without an extensive review  
14 of the plant I have no quantitative number at this time I  
15 can give you. However, my point was that with a reliability  
16 of the auxiliary feedwater system as indicated or as  
17 estimated, that I estimate that it is, I find it not  
18 inconsistent with these numerical goals in consideration of  
19 how the auxiliary feedwater system would participate in  
20 sequences that would lead to core damage.

21 Such a sequence would have to take into  
22 consideration both its failure and the HPI failure.

23 Q And the high pressure injection?

24 A (WITNESS CURRY) Yes.

25 Q Yes, I see. All right.

26 (Pause.)

27 CHAIRMAN SMITH: Are there any further questions of  
28 this panel? All right. You have some.

29 How about you, Mr. Dornseife?

1 MR. DORNSIFE: Very short.

2 CHAIRMAN SMITH: All right. We will take your  
3 questions, and then we will take a very short recess to see  
4 if there are any additional questions by the Board.

5 Mr. Dornsife.

6 CROSS ON BOARD EXAMINATION

7 BY MR. DORNSIFE:

8 Q Mr. Curry, you are aware, I am sure, that previous  
9 testimony has indicated there is conservative analysis  
10 indicating there is 20 minutes available before you need  
11 emergency feedwater high pressure injection for a loss of  
12 main feedwater, is that correct?

13 A (WITNESS CURRY) That is correct.

14 Q And I believe in questions from Dr. Jordan you  
15 indicated that in all likelihood -- if you were to include  
16 the 20-minute time required to get the system started, you  
17 could take credit for operator action.

18 A (WITNESS CURRY) That is correct.

19 Q What time would you normally assume operator  
20 action? Say if you are doing it for the Westinghouse, when  
21 did you assume operator action?

22 A (WITNESS CURRY) Well, the level of detail of our  
23 knowledge is not so fine that I can assume operator action  
24 at six minutes or six and a half minutes. The level of  
25 detail is such that at certain intervals we assume no

1 operator action. At later intervals we give some credit,  
2 and still longer intervals we give even more credit. In  
3 real life, of course, it is a continuous distribution, but  
4 in terms of the definition of our data, it is more or less a  
5 discrete type thing.

6 Q For example, what did you use for the Westinghouse  
7 analysis?

8 A (WITNESS CURRY) It is in the data I gave in my  
9 Attachment 2 to my testimony.

10 (Pause.)

11 Okay. So if you will look at Table 3-2 and the  
12 last page of that where the table is entitled, the subgroup  
13 of the table is entitled "Acts and Errors of a Post-Accident  
14 Nature."

15 Q But that does not give the time you assumed.

16 A (WITNESS CURRY) Well, if you look at the first  
17 heading at the top of the table it says "Time Actuation  
18 Needed." So there are times which say 5, 15, and 30 minutes.

19 Q The design as it will exist at restart if you are  
20 able to take credit for operator action, would its  
21 reliability be similar to the Westinghouse designs?

22 A (WITNESS CURRY) Its reliability would certainly  
23 improve. If you are talking about similar to the best  
24 Westinghouse designs, of course the Westinghouse designs  
25 also have a range of reliabilities.

1       Q     I am talking about -- well, the one you use, 2 x  
2                -5  
3     10 , or let's compare it with the proposed design, the  
4     final design including automatic actuation.

5       A     (WITNESS CURRY) Right. I would suspect that if  
6     credit were given for operator action -- in other words, you  
7     are considering a longer time frame -- the reliability would  
8     improve, and it is my judgment -- again, I have not done  
9     that analysis. It is my judgment that this system could  
10    broach the high range.

11      Q     If you were using this particular plant design, the  
12     restart design, in terms of using it in a sequence, you  
13     would then use operator intervention to determine the total  
14     probability, is that correct?

15      A     (WITNESS CURRY) Certainly when doing the risk  
16     analysis of a plant we answer the question of probability of  
17     core damage, yes.

18      Q     Mr. Wermiel, on the Westinghouse plants that you  
19     say do not have backup feed and bleed, when you say they do  
20     not have backup feed and bleed, do you mean safety grade;  
21     they still have a PORV that operator action could open and  
22     provide some feed and bleed?

23      A     (WITNESS WERMIEL) No. What I mean to say is the  
24     high pressure injection pump discharge pressure is not  
25     equivalent to the primary coolant normal operating  
   pressure. You must depressurize in some manner to take

1 credit for injection from the high pressure pump.

2 Q But the operators could open the power-operated  
3 relief valve and get the pressure down so they could get  
4 water into the core.

5 A (WITNESS WERMIEL) Yes, that is possible. So,  
6 okay, if you are going to say he has depressurized and will  
7 maintain the primary coolant system depressurized, he can  
8 use nonsafety grade equipment such as the PORV to implement  
9 a type of feed and bleed operation.

10 MR. DORNSIFE: Okay. I have no further questions.

11 CHAIRMAN SMITH: All right. We will take --

12 DR. JORDAN: He had a question.

13 CHAIRMAN SMITH: Excuse me, Mr. Baxter. Go ahead  
14 with your question.

15 BY MR. BAXTER:

16 Q Gentlemen, do you have the B&W generic report,  
17 BAW-1584 on auxiliary feedwater system reliability analyses  
18 dated December 1979?

19 A (WITNESS WERMIEL) Yes.

20 Q Would you turn to page 16, please? It is Table 1,  
21 Summary of Major Characteristics of B&W Operating Plant AFW  
22 Systems. We will provide you with a copy of the page.

23 A (WITNESS CURRY) There are a couple of numbering  
24 schemes used in this report. That is why I am confused.

25 Q The second entry from the bottom is AFW control and

1 valves. Is it correct that in addition to TMI-1, at least  
2 at the time of this report, December 1979, that the ICS  
3 controls the flow control valves for EFW systems at  
4 Arkansas, Crystal River 3, and Rancho Seco as well?

5 A (WITNESS WERMIEL) Yes.

6 MR. BAXTER: Thank you. I have no further  
7 questions.

8 CHAIRMAN SMITH: All right. We will take a break  
9 just long enough to see if we have additional questions. It  
10 is likely that we do not, and if we do not, we will come  
11 back and adjourn until 1:00.

12 MR. BAXTER: Okay. In case we are not going back  
13 on the record then I have one closing --

14 CHAIRMAN SMITH: We will go back on the record.

15 MR. CUTCHIN: I have no redirect up to this point.

16 (Recess.)

17 CHAIRMAN SMITH: All right. During the recess we  
18 went through a checklist from the Commission's order of  
19 August 1979 to determine whether the testimony -- the record  
20 is complete with respect to the auxiliary emergency  
21 feedwater. There is one thing that remains in doubt, and we  
22 would like to have it verified that item II.I.7.b, auxiliary  
23 feedwater flow indication to steam generators, is safety  
24 grade before restart.

25 I know you say it by reference that that item has

1 been satisfied, but we want it narratively affirmed if that  
2 is the case.

3 WITNESS WERMIEL: To the best of my knowledge that  
4 is the case.

5 CHAIRMAN SMITH: That kind of answer is shaky.

6 WITNESS WERMIEL. You see, the actual review of the  
7 safety grade qualification of the steam generator flow  
8 indicating devices was not done by myself. It was done by  
9 another person.

10 CHAIRMAN SMITH: Okay. You are not the right  
11 person to ask that question then.

12 WITNESS WERMIEL: I have only again hearsay from  
13 talking with him that he has seen the final documentation  
14 for its qualification and has confirmed that that item is  
15 satisfied.

16 CHAIRMAN SMITH: You talked to the -- who is that?

17 WITNESS WERMIEL: The fellow's name is Robert  
18 Fitzpatrick.

19 CHAIRMAN SMITH: In preparing your testimony you  
20 checked with him on that point.

21 WITNESS WERMIEL: That is correct.

22 CHAIRMAN SMITH: Did you just say is II.I.7.b  
23 satisfied, or did you actually ascertain that it is safety  
24 grade?

25 WITNESS WERMIEL: Let me think of exactly what I

1 asked him. I believe I asked him if he had completed the  
2 open area with respect to that particular item, and that, I  
3 think, identified in the restart SER had to do with its  
4 qualification documentation, and he said yes. And I would  
5 infer from that that it is now qualified to safety grade  
6 requirements.

7 CHAIRMAN SMITH: All right. Now, the only other  
8 safety grade requirement on emergency feedwater we can  
9 identify is automatic initiation which was long term under  
10 NUREG-0753, but this is a short-term requirement.

11 I think we had better confirm that so the record is  
12 complete, unless it has been otherwise in the testimony.

13 MR. BAXTER: I wonder if you had looked at page  
14 C-8-40 of the SER - the restart report, at the very top of  
15 the page.

16 CHAIRMAN SMITH: Okay.

17 (Pause.)

18 MR. CUTCHIN: Also, Mr. Chairman, in the table up  
19 in the front of NUREG-0680 the Staff has indicated in the  
20 table that that item is complied with. However, in the  
21 words that you are reading from at the top of page C-8-40,  
22 they are in compliance subject to submittal of vendor  
23 environmental qualification certification. So with that  
24 subject, too, the Staff sees it to be in compliance.

25 (Pause.)

1           CHAIRMAN SMITH: It is review evaluation of  
2 design. That is the problem. Now, this may very well be an  
3 item that if everyone agrees it is sufficient and necessary  
4 in the short term for startup, it may very well be an item  
5 left for the director of NRR to certify as actually in  
6 place. So I see no particular problem if the record can be  
7 reliably construed to mean that, but the SER simply stops --  
8 I mean, seems to stop at they have approved the design.

9           (Board conferring.)

10          MR. BAXTER: Mr. Chairman, I think this is a  
11 situation that is common to many, many of the modifications  
12 that are addressed in the record. We do not have today  
13 installed all of the systems that have been testified to for  
14 which design and Staff review and approval have been done.

15          I think it is inherent in the process that the  
16 director is going to be -- has to certify that these things  
17 actually have been put in.

18          CHAIRMAN SMITH: I am not troubled by that at all,  
19 just so long as we all understand that that is what is  
20 happening, and that there is a commitment for it, and it is  
21 committed.

22          Okay. I think the record is complete on it.

23          Have I correctly identified the only two safety  
24 grade modifications required by the Commission order?

25          WITNESS WERMIEL: Yes, you have. Item II.I.7.a and

1 II.I.7.b of Lessons Learned are the only two.

2 CHAIRMAN SMITH: All right, then. Is there  
3 anything further?

4 (No response.)

5 All right. We will adjourn until 1:00 p.m.)

6 (The witnesses were excused.)

7 (Thereupon, at 10:26 a.m., the hearing was  
8 recessed, to be reconvened at 1:00 p.m., the same day.)

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## AFTERNON SESSION

2

(1:03 p.m.)

3

CHAIRMAN SMITH: Is there any preliminary  
4 business?

5

(No response.)

6

CHAIRMAN SMITH: All right. This is the first  
7 day of taking up of offsite emergency planning. I think we  
8 should clarify that.

9

You are serving, Ms. Bradford, you are serving as  
10 the Lead Intervenor on emergency planning matters for  
11 Newbury Township Intervenors and ECNP, and you are also  
12 serving as lead Intervenor for all procedural matters for  
13 all of the Intervenors. Did you understand that?

14

MS. GAIL BRADFORD: Yes, sir. To the extent that  
15 it relates, the procedural matters relate to emergency  
16 planning, I may not be helpful to UCS on their procedures --  
17 on procedures, for example.

18

CHAIRMAN SMITH: I meant emergency planning.

19

MS. GAIL BRADFORD: Yes, sir.

20

CHAIRMAN SMITH: All right. We had informed Dr.  
21 Kepford last week and Dr. Johnsrud this week that emergency  
22 planning matters would begin as early as yesterday. Also,  
23 Mrs. Aamodt was informed.

24

There are some pending motions from Mrs. Aamodt,  
25 but I guess they do not relate -- yes, they do relate to

1 emergency planning and they should be ruled upon. Do you  
2 know what her plans are? She has requested -- do you know,  
3 does she plan to be here today?

4 MS. GAIL BRADFORD: I have not been in  
5 communication with her. I understand the Board's secretary  
6 informed her that today we were starting at 1:00, but I have  
7 not talked with her.

8 (Pause.)

9 CHAIRMAN SMITH: We also asked the parties to be  
10 prepared to respond to our request concerning the  
11 relationship of the NRC response to the Commonwealth's  
12 emergency plan. Are the parties prepared to discuss the  
13 Board's request and recommendation?

14 MS. STRAUBE: Yes.

15 CHAIRMAN SMITH: Ms. Straube.

16 MS. STRAUBE: Mr. Adler has asked me to tell you  
17 that there has been a meeting this past week between NRC  
18 officials and Commonwealth officials in which they discussed  
19 the problems that the Commonwealth had and were discussing  
20 the possibility of a memorandum of understanding. I believe  
21 presently the NRC has taken those problems we identified and  
22 are looking at them, and in apparently about two weeks they  
23 are going to come back with their response to our  
24 problems.

25 And I guess at that point we will see whether we

1 are satisfied or not and whether there will be a memorandum  
2 of understanding entered into.

3                   MR. GRAY: Yes, Mr. Chairman, I might elaborate.  
4 There was a meeting between Mr. Chesnut and Dr. Gallina from  
5 Region I and PEMA and BRW representatives this past Tuesday,  
6 at which time the state expressed or listed its concerns.  
7 There was a discussion of those concerns and those concerns  
8 were taken back to both headquarters and the region for  
9 preparation by the staff of a response and proposals to  
10 accommodate the state's concerns.

11                  There is a tentative plan to meet again with the  
12 state in about two weeks from last Tuesday with the  
13 proposals.

14                  CHAIRMAN SMITH: Very good. Did I understand you  
15 to say the Board will be receiving a report? Will the Board  
16 be receiving a report on the results of the meetings?

17                  MR. GRAY: Yes, we can present a report subsequent  
18 to the two-week meeting. We certainly do expect to present  
19 a report as to what is transpiring.

20                  CHAIRMAN SMITH: Okay, thank you.

21                  All right. Do we have -- another matter. Ms.  
22 Bradford, you had indicated that you were going to request  
23 subpoenas for county emergency coordinators, and you have  
24 not done that. Is that still your plan?

25                  MS. GAIL BRADFORD: Yes, sir.

1 CHAIRMAN SMITH: You have to allow enough time for  
2 the subpoenaed person to complain about the subpoena and  
3 move to quash it.

4 MS. GAIL BRADFORD: Yes, sir. Right now we are  
5 assembling information for the Board to consider before --

6 CHAIRMAN SMITH: Okay.

7 MS. GAIL BRADFORD: -- a subpoena would be  
8 issued. How much time is enough time?

9 CHAIRMAN SMITH: Ten days.

10 MS. GAIL BRADFORD: Before the witness would be  
11 asked to appear?

12 CHAIRMAN SMITH: Yes.

13 MS. GAIL BRADFORD: Thank you.

14 CHAIRMAN SMITH: I do not know where I got that  
15 figure, so --

16 (Laughter.)

17 CHAIRMAN SMITH: So it may indicate more assurance  
18 than I really have. But I think it is in the rules.

19 (Board conferring.)

20 CHAIRMAN SMITH: Is there any other preliminary  
21 business?

22 (No response.)

23 CHAIRMAN SMITH: Oh, yes. Mr. Cunningham, we  
24 received your letter of March 31, which incidentally you  
25 have not served. Any communications to the Board should be

1 served on the parties.

2 MR. CUNNINGHAM: Yes. It went out on the 1st.

3 And I also today served the Licensee with a copy of the  
4 letter.

5 CHAIRMAN SMITH: All right. You served one  
6 party?

7 MR. CUNNINGHAM: I served the Licensee today.

8 When I came back yesterday there should have been service of  
9 all of the parties.

10 CHAIRMAN SMITH: All right.

11 MR. CUNNINGHAM: Pursuant to your rules.

12 CHAIRMAN SMITH: I don't know if you mean it to be  
13 a complete statement, but in your first paragraph you say:  
14 "It is also my understanding that under the Board's order  
15 individual Intervenors will also retain the right to  
16 cross-examine witnesses in areas covering their  
17 contentions."

18 That is not a complete statement. It is only upon  
19 a demonstration that it could not be worked out through a  
20 single Intervenor.

21 MR. CUNNINGHAM: That is understood.

22 CHAIRMAN SMITH: You understood that, okay.

23 (Board conferring.)

24 CHAIRMAN SMITH: Dr. Little pointed out an  
25 ambiguity in your letter. You said you anticipated making

1 some limited appearances. A "limited appearance" has a  
2 specialized meaning in NEC procedures.

3 MR. CUNNINGHAM: I was not attempting to use a  
4 word of art, Chairman Smith. By that I meant, because of  
5 the indication in the letter, I think that I probably better  
6 serve the Intervenors by doing other technical work and  
7 providing cross-examination plans and doing the drafting for  
8 subpoenas and contacting witnesses for rebuttal.

9 CHAIRMAN SMITH: Now, Ms. Bradford has served  
10 objections to the testimony of Mr. -- Dr. Dynes and  
11 Levenson. Have you served these objections or are they just  
12 notes of what you are going to state orally?

13 MS. GAIL BRADFORD: These are notes of what I  
14 wanted to state orally. I just included it in the  
15 cross-examination plan.

16 CHAIRMAN SMITH: I understand.

17 MS. GAIL BRADFORD: It is not very well worded on  
18 this sheet.

19 CHAIRMAN SMITH: All right.

20 Let's call our first witness and we will go into  
21 it.

22 (Board conferring.)

23 CHAIRMAN SMITH: Do you have any preliminary  
24 matters, Mr. Zahler?

25 MR. ZAHLER: No, Mr. Smith. There are a few other

1 open items that I would like discussed, but not immediately,  
2 actually. There are objections to Dr. Molholt's testimony.

3 Also, I think, given the Board's memorandum from  
4 the past time we were here and the staff's recent filing,  
5 Licensee would like to discuss that matter further with the  
6 Board. But -- in fact, I have discussed it with counsel for  
7 the staff and we prefer to put it off a little bit.

8 CHAIRMAN SMITH: Yes. The Board itself had  
9 requested you be able to address the test, the timing of the  
10 test.

11 MR. ZAHLER: The drill I can discuss right now.  
12 But it may be better to discuss them all at one time.

13 CHAIRMAN SMITH: That would be fine.

14 MR. ZAHLER: Licensee then calls as its next  
15 witness Russell R. Dynes.

16 Whereupon,

17 RUSSELL R. DYNES,  
18 called as a witness by counsel for Licensee, having first  
19 been duly sworn by the Chairman, was examined and testified  
20 as follows:

21 DIRECT EXAMINATION

22 BY MR. ZAHLER:

23 Q Dr. Dynes, would you please state your full name  
24 and business address for the record?

25 A Russell R. Dynes, 1722 N Street, Washington, D.C.

1 Q Dr. Dynes, do you have before you a copy of  
2 testimony entitled "Licensee's Testimony of Russell R. Dynes  
3 on the Principles of Planning for Emergencies," dated March  
4 16, 1981?

5 A I do.

6 Q Did you prepare this testimony?

7 A I did.

8 Q Do you have any corrections to the testimony?

9 A No.

10 Q Dr. Dynes, as drafted do you adopt this testimony  
11 as your testimony in this proceeding?

12 A Yes.

13 MR. ZAHLER: Mr. Chairman, I would request that  
14 the testimony be received as though read and be incorporated  
15 into the transcript.

16 MS. GAIL BRADFORD: Sir, we object.

17 CHAIRMAN SMITH: All right. Ms. Bradford or  
18 whoever is going to address it. Should I continue to call  
19 upon Ms. Bradford?

20 MR. CUNNINGHAM: I believe so at this point, to  
21 keep the record clear.

22 MS. GAIL BRADFORD: We object to this testimony in  
23 that it is general in nature and not specific to Three Mile  
24 Island. The witness claims in the testimony to be only  
25 briefly acquainted with NUREG-0654 or the Three Mile Island

1 area plans, emergency plans.

2 We feel that testimony would be more appropriate  
3 to a generic hearing on emergency planning. We do not  
4 understand whether this is a criticism of the emergency  
5 planning rule or a criticism of 0654 criteria or a criticism  
6 of TMI planning.

7 The testimony does not say how the planning  
8 standards suggested would relate to the emergency planning  
9 rule or to 0654 or to the Three Mile Island area plans. And  
10 it only states that Dr. Dynes is not familiar enough with  
11 those plants to testify about them. The testimony is  
12 therefore too general to be relevant or helpful in the  
13 hearing.

14 We also feel that the testimony is a subtle and  
15 inappropriate form of psychological stress testimony. It  
16 apparently assumes that the Three Mile Island area residents  
17 are not different from other planning areas' residents. No  
18 basis for this assumption is given.

19 DR. LITTLE: Ms. Bradford, I want to interrupt  
20 right there. When you say this is a form of psychological  
21 stress testimony, what do you mean by that?

22 MS. GAIL BRADFORD: We feel that the testimony  
23 essentially assumes that there is no psychological stress in  
24 this area, and that this area has the same reaction patterns  
25 as another area.

1 DR. LITTLE: Do you mean that the testimony causes  
2 psychological stress or it is directed to psychological  
3 stress issues?

4 MS. GAIL BRADFORD: Well, I think that in order  
5 for Dr. Dynes or anyone to make a statement that this area's  
6 response pattern would be the same as another area's, he  
7 would need to have ascertained whether or not there is  
8 something special or unique about this area. And that we  
9 suggested that something special would be psychological  
10 stress due to the Three Mile Island and the evacuation two  
11 years ago.

12 And since it is not mentioned, we feel that it is  
13 a psychological stress, rather subtly but still a  
14 psychological stress testimony. Dr. Dynes' testimony is  
15 therefore inadmissible because, although he may or may not  
16 be technically qualified to testify about psychological  
17 stress, in the TMI area he has not stated psychological  
18 stress in this area and cannot state that his planning  
19 standards, suggested are applicable to the TMI area.

20 ANGRY proposes that only site-specific exceptions  
21 or special applications to the TMI rule are appropriate. We  
22 intend to show why exceptions that we may seek to the EP  
23 rule or to the -- NUREG-0654 are site-specific to TMI, and  
24 we ask the Board in general to expect that site specific  
25 reasons be shown to adhere to NUREG-0654 criteria.

1           This testimony cannot show site specificity;  
2 therefore, it should not be admitted. We also thought that  
3 the testimony seems to be an afterthought. It could have  
4 been planned in advance and made site specific.

5           Mr. Zahler stated at the beginning of onsite  
6 testimony that the Licensee planned no other witnesses other  
7 than the evacuation time estimate study sponsors.

8           CHAIRMAN SMITH: Any other objections?

9           MS. STRAUBE: The Commonwealth has no specific  
10 objection to put on the record, but we would in general  
11 agree with the statements made by Ms. Bradford that the  
12 testimony is not at all site specific to TMI. It does not  
13 seem to reveal any facts, which is I understand it is the  
14 standard for admissibility of evidence, any facts that are  
15 related to this particular proceeding. It does not address  
16 any of the contentions that were raised by the Intervenors.  
17 And that is pretty much it.

18           CHAIRMAN SMITH: Mr. Zahler?

19           MR. ZAHLER: Mr. Chairman, before I respond  
20 specifically to Ms. Bradford's comments, I would like to  
21 make a general statement as to the nature of Licensee's  
22 testimony with respect to offsite emergency planning. When  
23 Licensee pondered the type of approach that we thought would  
24 be helpful to the Board, we realized it had neither the  
25 resources or the expertise to conduct an in-depth review of

1 either the state or the county plans or to respond in a  
2 specific way to the contentions.

3                 In fact, it believed and it is true that there is  
4 substantial testimony that has been submitted to the Board  
5 in those areas, both by the state and FEMA, and duplicating  
6 that by Licensee would serve little purpose. But there is  
7 an area where the Licensee thought it could make a  
8 contribution to the record, and that was to provide an  
9 expert in emergency planning, someone who has spent his  
10 lifetime dealing with the concepts that this Board and this  
11 Commission is wrestling with, and provide some guidance in  
12 the true nature of expert testimony as to basic rules that  
13 are applicable in the developing and applying of emergency  
14 planning principles to any situation.

15                 Dr. Dy es is one aspect of that effort that we are  
16 providing in this testimony. We think it is appropriate.  
17 We think it is helpful to the Board.

18                 Specifically in response to what Ms. Bradford  
19 said, it is true that the testimony is general and it is not  
20 specific to TMI. I know of no basis for objecting to  
21 testimony on that ground.

22                 Similarly, Ms. Bradford says that it is more  
23 appropriate to a generic hearing on emergency planning.  
24 That is not the case at all. It is appropriate and useful  
25 in this procedure. It provides expert guidance to this

1 Board on how to apply the criteria and planning standards  
2 identified in various guidance documents that the NRC staff  
3 and FEMA have produced.

4 We think that it can be used by this Board and  
5 does contribute to the record. Moreover, to the extent that  
6 Ms. Bradford says that she is not sure whether this is a  
7 criticism of the rule or a criticism of 0654 or a criticism  
8 of TMI planning, she misconstrues the nature of the  
9 testimony. The testimony is not intended to challenge the  
10 emergency planning rule. It is not intended to challenge  
11 0654. And it is not a criticism of planning in the TMI  
12 area.

13 What the testimony does is say, accepting the 16  
14 planning standards of NUREG-0654, which is the rule, that  
15 there are various ways in which those planning standards can  
16 be applied and there are various principles that anyone on  
17 applying those standards should use.

18 The NRC has set forth various evaluation  
19 criteria. We are not challenging that criteria through Dr.  
20 Dynes' testimony. What we are doing is putting those  
21 criteria in context and explaining to the Board the method  
22 in which it should go about evaluating those criteria.

23 It has always been recognized that one need not  
24 comply with every single criteria in a regulatory guide type  
25 document. Dr. Dynes' testimony provides the context for

1 this Board to make that type of assessment if there are  
2 instances where particular criteria are not complied with.

3                 The testimony does not address whether all  
4 criteria have been complied with or have not. Moreover,  
5 compliance with the criteria is not necessarily an open and  
6 shut matter. Dr. Dynes' testimony provides the context for  
7 this Board to determine whether the plans do in fact comply  
8 with any particular criteria and therefore it is helpful to  
9 the Board.

10                 With respect to the concern about psychological  
11 stress and the testimony assumes that, if that be the case  
12 then Ms. Bradford's recourse is through cross-examination of  
13 this witness to determine if that is an assumption of the  
14 testimony and whether it changes the content of the  
15 testimony. It is not to object to the testimony and throw  
16 it out.

17                 ANGRY can make its position known through  
18 cross-examination with respect to the psychological stress  
19 matter.

20                 Finally, with respect to the comment that the  
21 testimony is only an afterthought, as a factual matter it is  
22 not true. Licensee has been in contact with Dr. Dynes for  
23 over a year. Moreover, Licensee has informed ANGRY and the  
24 other Intervenors on previous occasions, as far back as the  
25 July 1980 meeting among Intervenors and Licensee, that we

1 were contemplating an expert with respect to the general  
2 principles of emergency planning.

3 I do not really think it is important for the  
4 resolution of the objection before the Board, but I do want  
5 to set the record straight. This is certainly not something  
6 that has been put together in a slap-dash manner and  
7 presented to the Board.

8 Finally, with respect to the comment by the counsel  
9 for the Commonwealth, factual testimony is clearly  
10 admissible, and it is also recognized that expert opinion by  
11 a properly qualified expert is admissible evidence. And  
12 that is what we are producing in terms of Dr. Dynes, expert  
13 testimony in the truest sense of the word as to the  
14 guidelines and principles to be used in applying and  
15 analyzing the facts developed in other parts of this  
16 proceeding.

17 Licensee believes that the objections are not well  
18 taken.

19 (Board conferring.)

20 CHAIRMAN SMITH: Mr. Zahler, could you be helpful  
21 and tell us how you would use Dr. Dynes' testimony in your  
22 proposed findings?

23 MR. ZAHLER: Let me postulate an example. I am  
24 not sure that it is one the facts are necessarily going to  
25 bear out. There is a contention in this proceeding that

1 indicates there is a need to have a catalogue of tow trucks  
2 to have an effective evacuation. The PEMA testimony  
3 addresses that, by the way, specifically.

4 It might be, assuming that the facts bore out that  
5 there was no tow truck list or catalogue, that Dr. Dynes  
6 testimony might be used by the Board to conclude that such a  
7 particular detail with respect to an actual evacuation need  
8 not be included in the plan, but that is the type of thing  
9 that, either because of past experience or because of the  
10 way evacuations are carried out, will be taken care of  
11 during the actual evacuation itself and need not be covered  
12 by the plan.

13 Let me point out that, for example, the  
14 requirement for a tow truck list is not a requirement of  
15 0654. The question, therefore, for the Board, is is it  
16 something that shd be included, is it necessary?

17 Dr. Dynes' testimony provides a context and a  
18 framework for this Board to make that type of assessment.  
19 Absent this, it is not clear to me how the Board would go  
20 about resolving that type of issue.

21 (Board conferring.)

22 CHAIRMAN SMITH: The objection is overruled. I do  
23 not know if I have them in the order you arranged them, but,  
24 because it is generic and not site specific, so long as the  
25 testimony is relevant, is not a bar to testimony in this

1 case.

2                 The fact that it is -- that Dr. Dynes may not know  
3 -- have information about the situation at Three Mile Island  
4 can very well be developed in cross-examination, and that  
5 will be considered in the weight to be given to his  
6 testimony.

7                 You are correct that there are strong elements of  
8 psychological stress in his testimony. You will recall when -  
9 we certified the issue of psychological stress to the  
10 Commission we stated that we believed we did not need  
11 Commission authority to consider pschological stress as it  
12 relates to the efficacy of emergency plans. The Commission  
13 did not disagree with us. As a matter of fact, three of the  
14 Commissioners indicated some language in agreement with that  
15 expressly, and . . . fourth Commissioner just was silent on  
16 the issue.

17                 So we warned the Commission that we would consider  
18 psychological stress as it relates to emergency planning.  
19 To the extent that he gets into the issue of psychological  
20 stress which does not have a relationship to emergency  
21 planning, well, I agree that that would be beyond the scope  
22 of the hearing and inappropriate.

23                 You will recall, we actually had referred to Dr.  
24 Dynes in our certification to the Commission, but that was  
25 in terms of psychological stress in general and not

1 specifically to emergency planning.

2 With respect to Ms. Straube's objection that the  
3 testimony contains no factual testimony, Mr. Zahler is  
4 totally correct in that. Within my experience, it is  
5 probably even more likely that an expert witness may know  
6 nothing about the facts being litigated and bring in the  
7 expertise to be applied to the facts developed through other  
8 sources of evidence. So that is not a recognized basis for  
9 barring expert testimony. It is quite common and probably  
10 more common than not.

11 It is stated that the testimony should not be  
12 accepted because it does not address an Intervenor's  
13 contention. Well, that seems to be in dispute. But  
14 notwithstanding that, it addresses a mandatory issue in the  
15 proceeding, an issue which this Board has to consider.

16 Mr. Zahler states that it does in fact address a  
17 particular contention. I think that it would have been  
18 appropriate for the testimony to identify the contention  
19 that it was addressing or counsel to have done it. But if  
20 that has caused any prejudice, why, we will accept requests  
21 for relief.

22 I am sorry if I forgot any of the points that were  
23 raised. If you will remind me of what they are, we will  
24 deal with them. But I think we have covered the ones that I  
25 think we were requested to consider.

1                   Mr. Zahler?

2                   MR. ZAHLER: Mr. Chairman, you overruled the  
3 objection, but you did not receive the testimony into  
4 evidence.

5                   CHAIRMAN SMITH: That is right. The testimony is  
6 received.

7                   (The document referred to, the written testimony  
8 of Dr. Dynes, follows:)

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )  
 )  
METROPOLITAN EDISON COMPANY ) Docket No. 50-289  
 ) (Restart)  
(Three Mile Island Nuclear )  
Station, Unit No. 1) )

LICENSEE'S TESTIMONY OF RUSSELL R. DYNES  
ON THE PRINCIPLES OF PLANNING FOR EMERGENCIES

-i-

OUTLINE

The purpose of this testimony is to present an overview of the process of emergency planning, by identifying those important principles which should guide any developer of emergency plans.

TESTIMONY

My name is Dr. Russell R. Dynes. I am the current Executive Officer of the American Sociological Association, in Washington, D.C. I received a Bachelor of Arts degree in Sociology/Psychology in 1948, and a Master of Arts degree in Sociology in 1950, both from The University of Tennessee. In 1954, I received a Ph.D. degree in Sociology from The Ohio State University. I taught at the university level virtually constantly from 1948 through 1972. In 1964, I became the Co-Director of the Disaster Research Center at The Ohio State University. I held that position until 1977. I also served as the Chair of the Department of Sociology at The Ohio State University, from 1974 through 1977, when I accepted my current position at the American Sociological Association. I am a member of the American Academy of Political and Social Sciences, the North Central Sociological Association, and the International Sociological Association.

I have lectured and published extensively in a wide range of fields of sociology, with a special emphasis on emergency planning and preparedness. I sat as a member of the Advisory Committee on Emergency Housing of the National Academy of Sciences/National Research Council (NAS/NRC) in 1972, and chaired that organization's Committee on International Disaster Assistance from 1976 to 1979. I also served as the NAS/NRC liaison to the International Disaster Assistance Panel of the United Nations Association. I acted as a consultant to the

Federal Disaster Assistance Administration of the Department of Housing and Urban Development, and served as a senior consultant on the Federal Emergency Preparedness and Response Study of the President's Reorganization Project, from 1977 through 1978. In 1979, I was appointed head of the Task Force on Emergency Response and Preparedness of The President's Commission on The Accident at Three Mile Island. More recently, I was retained as a consultant to the Federal Emergency Management Agency on Cuban Refugee Camp Consolidation.

At Licensee's request, I have briefly reviewed the revised emergency plans prepared by the Commonwealth of Pennsylvania and the five risk counties of Dauphin, York, Lancaster, Cumberland and Lebanon for responding to a radiological emergency at the Three Mile Island Nuclear Station, Unit 1 ("TMI-1"). In addition, I have briefly reviewed "Criteria for Preparation and Evaluation of Radiological Emergency Plans and Preparedness in Support of Nuclear Power Plants," NUREG-0654/FEMA-REP-1 (Rev. 1, Nov., 1980). Based on my limited acquaintance with this material, the purpose of my testimony is not to compare the plans against the criteria document and reach some conclusion as to adequacy based on that comparison. Rather, my testimony presents an overview of the emergency planning process by identifying those important principles which should guide any developer of emergency plans.

NUREG-0654 is organized into 16 planning standards, with multiple evaluation criteria for each standard. It is readily

apparent that not all evaluation criteria are of equal importance. In fact, it is to be expected that no emergency plan will literally satisfy every criterion. Depending on local conditions, divergent views as to appropriate concepts of operations, and historically developed solutions to particular emergency planning issues, I would be very surprised if state and local governments developed plans precisely in the mold anticipated by NUREG-0654.

The task in evaluating such plans is not merely to count criteria satisfied and conclude on the basis of this numerical exercise that a given plan is, or is not, adequate. Instead, the fundamental elements of any good emergency plan must be identified, and a determination made whether the plan provides a sufficient response to each of the identified elements. These elements include matters such as: organization and manpower, accident assessment, accident notification, and emergency response. Although somewhat complex and overlapping, the 16 planning standards identified in NUREG-0654 adequately set forth the fundamental elements of a good radiological emergency response plan.

The remainder of my testimony addresses the context within which these 16 planning standards should be applied. In the evaluation of emergency planning, such standards are sometimes misapplied because the planning process itself is misunderstood. Specific aspects of planning can be evaluated in terms of a set of principles which include the following:

1. Planning is a process, rather than a product.

For most purposes, planning is not action with a definite end; it is a continuous process whereby persons develop procedures for future situations. The development of a written plan at a specific time is only one part of the total planning process.

2. Planning is partly an educational activity.

Involved persons and groups must know the outline features of the emergency plan if they are to work. The planner must learn about actual problems and possible solutions. The planner must convey to those likely to become involved what can be generally expected and what roles they will play. Too often, planning is seen only in the narrow sense of completing written plans. It is more useful to think of planning in the broader sense of educating oneself and others about anticipated events and problems, and the most efficient and effective responses in an emergency.

3. Planning should focus on principles, not details.

In developing written plans, there is a tendency to elaborate them with specific details. Emergency plans should focus on principles, not concrete details. There are several reasons for this. First, it is impossible to anticipate everything. Second situations are constantly changing and specifics quickly become outdated. Third,

too many details leave the impression that everything is of equal value, when clearly that is not the case.

Finally, a complex and detailed plan is forbidding to potential users and may be ignored. While emergency planning cannot totally ignore details, particularly at the organizational level, it always should focus on general principles and in that sense the aim should be to produce simple, rather than complex, written plans.

4. Planning attempts to reduce the unknowns in a problematical situation. While in some instances planning is oriented to prevention, most planning is oriented toward altering or modifying what will happen. Plans can indicate the range of problems that might occur and possible solutions to them. Thus, planning reduces the uncertainty of emergencies; it does not prevent them from happening. It is unwise to assume that everything can be anticipated or that all of the unknown can be accurately predicted.

5. Planning should be based on what is likely to happen, not on the worst scenario. Often, the initial inclination is to premise planning on the worst possible case; the human imagination is scarcely limited in developing such worst cases. However, it is best to plan for likely cases. It is thus better, for example, to plan for an evacuation suitable to a likely scenario than to

plan a massive evacuation based on an unlikely scenario. Sound plans for likely cases serve as the basis for actions on a larger scale, if necessary.

6. Planning aims at evoking appropriate actions.

Sometimes, planning is seen as primarily a mechanism of expediting response to an emergency. That can be an end result. A major objective of planning, however, is appropriateness of response rather than speed of response. As an example, it is generally more important to obtain valid information as to what has happened than to take immediate action. Reacting to the immediate situation is rarely the most effective and efficient response. Thus, one objective of planning should be to delay impulsive reactions as well as to evoke appropriate actions.

7. Planning for emergencies should be based on the patterns of everyday routines. Planning for emergencies often anticipates new dramatic, unfamiliar situations. Emergencies, however, are generally characterized by the continuation of old routines and habits. Rather than trying to change and redirect such habits, it is better to count on them as the basis for emergency planning. For example, evacuation routes should utilize familiar and usual traffic patterns. Warnings should be based on a knowledge of usual listening habits and on the temporal locations of populations during a day. Emergency situ-

ations do not create incompetence and they generally have clear continuity to previous "normal" situations so that usual forms of action are still appropriate.

8. Planning must be based on knowledge. In order to develop plans for what is likely to happen, there is a need for accurate information. Planners sometimes operate on the basis of misconceptions about the responses of people in emergencies. For example, it is often incorrectly assumed that the immediate problems of emergencies include dealing with uncontrollable behavior and panic. Research over a wide variety of emergency situations indicates that this is not true. Such knowledge is important to planners because plans can only be designed and implemented if they are based on actual problems, not mythical ones, and on realistic solutions, not false ones. In summary, planning for emergencies should be based on certain general principles, rather than focused on specific details. Preoccupation with details, particularly those which attempt to make dramatic shifts in traditional habit patterns of organizations and individuals, will not only hinder emergency response but may create more problems than the emergency agent itself. Planning should focus on thinking ahead as to how community resources, both material and human, can be utilized most effectively in responding to a likely situation in the future. Such resources already exist in the

community and cannot be created by some future demand. Thus, planning must be based on the idea of anticipating the ways in which existing resources can be mobilized to confront "old problems" in a new form during an emergency.

RUSSELL R. DYNES

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American Sociological Association  
1722 N Street, N.W.  
Washington, D.C. 20036

Education:

A.B., The University of Tennessee,  
1948.  
M.A., The University of Tennessee,  
1950.  
Ph.D., The Ohio State University,  
1954.

Administrative Positions:

Executive Officer, American  
Sociological Association, 1977-  
Present.

Chair, Department of  
Sociology, The Ohio State  
University, 1974-77.

Co-Director, Disaster Research  
Center, The Ohio State  
University, 1964-77.

Academic Positions:

Fulbright Professor, Center for  
Advanced Study in Sociology,  
University of Delhi, December  
1971-March 1972.

Professor, The Ohio State University,  
1965-77.

Fulbright Professor, Ain Shams  
University and Arab States Center  
for Education in Community  
Development, United Arab Republic,  
1964-65.

Associate Professor, The Ohio  
State University, 1960-65.

Visiting Professor, Capital University,  
Summer 1958.

Assistant Professor, The Ohio State University, 1956-60.

Instructor, The Ohio State University, 1952-56.

Graduate Assistant, Assistant Instructor, The Ohio State University, 1951-52.

Graduate Assistant and Instructor, The University of Tennessee, 1948-50.

Research Experience:

Principal Investigator, Various Projects related to the Activities of the American Sociological Association, NSF, NIE, FIPSE, Tilly, 1977-Present.

Head, Task Force on Emergency Response and Preparedness, The President's Commission on The Accident at Three Mile Island, 1979.

Co-Principal Investigator, "Development of Baseline Information of Mental Health Disaster Assistance/Crisis Intervention Needs and Resources," National Institute of Mental Health, 1976-77.

Co-Principal Investigator, "Delivery of Mental Health Services in Disaster," National Institute of Mental Health, 1976-79.

Co-Principal Investigator, "Delivery of Emergency Medical Services in Disaster," Bureau of Health Services Research, Health Resources Administration, National Institutes of Health, Department of Health, Education, and Welfare, 1975-77.

Co-Principal Investigator, "Organizational Communication and Decision Making in Disaster," Advanced Projects Research Agency, 1974-75.

Co-Principal Investigator, "Delivery of Mental Health Services in the Xenia Disaster," State of Ohio Department of Mental Health and Mental Retardation, 1974-75.

Co-Principal Investigator, "Police Behavior in a College Riot," Law Enforcement Assistance Administration, 1970-71.

Co-Principal Investigator, "Organizational Functioning in Disaster," Office of Civil Defense, Department of Defense, 1963-77.

Co-Principal Investigator, "Organizational Response to Major Community Crises," National Institute of Mental Health, 1968-74.

Co-Principal Investigator, "Cross Cultural Studies of Disaster," Mershon Social Science Foundation, 1968-71.

Co-Principal Investigator, "Laboratory Simulation Studies of Organizational Behavior Under Stress," The Ohio State University Research Foundation, sponsored by the Office of Aerospace Research, Air Force, 1963-69.

Co-Director, Disaster Research Center, The Ohio State University, 1963-77.

Conference and Workshop Participation:

Participant, Workshop, Fire Safety and Disaster Preparation, Intergovernmental Science, Engineering and Technology Panel, American Association for the Advancement of Science, March, 1979.

Participant, Workshop, Functions and Effects, Emergency Preparedness, National Governors Association, Washington, DC, May 25-26, 1978.

Participant, Workshop on Issues and Options in Disaster Management, Office of Technology Assessment, Washington, DC, March, 1978.

Seminar Leader, "Civil Military Relations in Crises," Foreign Area Officers Course, Army Civil Affairs School, Fort Bragg, North Carolina, December 17-18, 1975.

Participant, Third National Conference  
on Reduction of Natural Hazards,  
University of Colorado, Boulder,  
Colorado, June 30-July 2, 1976.

Participant, Second National Conference,  
June 22-25, 1975.

Participant, Consultant, "Interorganizational  
and Interagency Relations in Major  
Disasters," National Emergency  
Planning Establishment, Government  
of Canada, Arnprior, Ontario, October  
22-24, 1974.

Participant, International Conference  
of Disaster Researchers,  
Sponsored by the Centre d'Etudes  
Psychosociologique des  
Sinistres et de leur Prevention,  
Paris, France, September 5-6, 1974.

Participant, Invitational Conference,  
"The Assessment of Social Impacts  
of Oil Spills," The Institute on  
Man and Science, Rensselaerville,  
New York, September 25-28, 1973.

Participant, NIMH Continuing Education  
Seminar in Emergency Mental Health  
Services, Washington, DC, June 22-24,  
1973.

Participant, Seminar on Organizational  
and Community Responses to Disasters,  
Sponsored by National Science  
Foundation and Japan Society for  
Promotion of Science, Columbus,  
Ohio, September, 1972.

Principal Lecturer, Seminar on the  
Sociological Aspects of  
Collective Stress, Sponsored  
by Patna University, A. N. Sinha  
Institute and the U.S. Educational  
Foundation in India, Patna. Bihar,  
India, March, 1972.

Participant, Illeme Seminaire  
Sur La Planification Des Secours En  
Cas De Catastrophes Naturelles,  
Port-au-Prince, Haiti, June, 1970.

Participant, Caribbean Regional Seminar  
on Pre-Disaster Preparedness,  
Port-of-Spain, Trinidad, June, 1968.

Participant, Workshop on Crisis Research,  
Sponsored by the University of  
Pittsburgh and the System Development  
Corporation, Newport Beach,  
California, December, 1966.

Honors and  
Professional  
Affiliations:

American Academy of Political and Social  
Sciences

American Association of University Professors  
Elected Board Member, 1970-71,  
Ohio State University

American Sociological Association  
Chair, Ad hoc Committee advising  
on participation of sociologists  
in Fulbright-Hays Programs (in  
conjunction with the Committee  
on International Exchange of  
Persons), 1968.

Member, Committee on the  
Development of World  
Sociology, two terms Co-Chair,  
Liaison with National and  
International Organization.

Chair, Committee on Committees, 1975  
Elected, 1974.

Member, Committee on Regional  
Affairs, 1974-77.

International Sociological Association  
Participation at Evian, France, 1966;  
Varna, Bulgaria, 1970; Toronto,  
Canada, 1974; Uppsala, Sweden, 1978.

North Central Sociological Association  
Program Chair, 1958  
Vice-President, 1970-71  
President-Elect, 1971-72  
President, 1972-73  
Representative to American  
Sociological Association,  
1974-Present.

Presented papers and/or chaired sessions of  
various annual meetings of:

American Sociological Association,  
International Sociological Association,  
Religious Research Association, Ohio  
Council on Family Relations, Society  
for the Scientific Study of Religion,  
American Society of Criminology,  
American Water Resources Association,  
Society for the Study of Social  
Problems, Southwestern Sociological  
Society, Pacific Sociological  
Society, Southern Sociological Society,  
International Congress of Learned  
Societies in the Field of Religion,  
North Central Sociological  
Association.

Phi Kappa Phi, 1976.

Honorary Lifetime Faculty Award, Defense  
Civil Preparedness Agency Staff  
College, 1974.

Honorary Faculty Membership, Defense  
Civil Preparedness Agency Staff  
College, 1973.

Fulbright Award, Senior Lecturer, India,  
1971-72.

Graduate Teaching Award, Alpha Kappa  
Delta, 1969.

Fulbright Award, Senior Lecturer, United  
Arab Republic, 1964-65.

Related Professional  
Activities:

Chair, NATO Fellowship Committee,  
Committee on International Exchange  
of Persons.

Elected to National Board of Directors,  
Fulbright Alumni Association, 1980-83.

Consultant, Federal Emergency Management  
Agency on Cuban Refugee Camp  
Consolidation, August 1980.

Member, Council of Secretaries, American  
Council of Learned Societies.

Consultant, Federal Disaster Assistance Administration, Housing and Urban Development.

Senior Consultant, Federal Emergency Preparedness and Response Study, President's Reorganization Project, Washington, 1977-78.

Consultant, Stanford Research Institute, "Technology Assessment of Earthquake Prediction," 1974-76.

Proposal Review, National Science Foundation, Canada Council.

President, Disaster Research Services, Inc.

Consultant, Wooster College, Denison University.

Liaison Member, International Disaster Assistance Panel, United Nations Association of the United States of America (for NAS/NRC).

National Academy of Sciences/National Research Council  
Member, Advisory Committee on Emergency Housing, Building Research Advisory Board, 1972.

Chair, Committee on International Disaster Assistance, Commission on Sociotechnical Systems, 1976-79.

Publications of the Committee:

The U. S. Government Foreign Disaster Assistance Program  
(Washington: National Academy of Sciences, 1978).

The Role of Technology in International Disaster Assistance  
(Washington: National Academy of Sciences, 1978).  
Assessing International Disaster Needs (Washington: National Academy of Sciences, 1978).

Board of Adjudicators, Graduate School,  
University of Kerala, India.

Convener, Board of External Examiners,  
University of Madras, India.

Consultant, Stanford Research Institute,  
1971.

Member, Developmental Task Force,  
Social Science Committee, University  
Council on Water Resources  
Research, 1970.

Member, Sociology Advisory Committee,  
Committee on International Exchange  
of Persons (reviews awards under  
Fulbright-Hays Program).

Member, Mayor's Faculty Advisory Committee,  
1967-68.

Danforth Associate, 1958-, Co-Chair Ohio  
Conference, 1963.

Publications:

Books:

- 1975 Deviance: Definition, Management and Treatment.  
New York: Oxford University Press. (Co-author).
- 1975 Social Movements, Violence and Change: The May Movement in Curacao. Columbus: The Ohio State University Press. (Co-author).
- 1970 Organized Behavior in Disaster. Lexington:  
D. C. Heath. 236 pp. (Republished 1976).
- 1969 Deviance: Studies in the Process of Stigmatization and Societal Reaction. New York: Oxford University Press. (Co-author).
- 1964 Social Problems: Dissensus and Deviation in an Industrial Society. New York: Oxford University Press. 594 pp. (Co-author).

Chapters, Monographs, and Reports:

1. Invited Paper at Third International Conference: Social and Economic Aspects of Earthquakes and Planning to Mitigate Their Impacts, Lake Bled, Yugoslavia, June 1981 (Sponsored by Yugoslav Association of Self-Managed Communities of Interest for Scientific Research and the U.S. National Science Foundation).
2. "Disasters and Emergency Medical Services." In Proceedings of First International Symposium on Emergency Medical Services. Forthcoming.
3. 1981 "The Contributions of the Social Sciences to the Evaluation of Emergency Preparedness and Response" in The Accident at Three Mile Island: The Human Dimensions, B. Sills, C. Wolff and E. Shelanski, eds.), Boulder, Westview Press.
4. 1979 Report of the Emergency Preparedness and Response Task Force, Staff Report to the President's Commission on The Accident at Three Mile Island, Washington, U.S. Government Printing Office.

5. 1979 "Helping Behavior in Large Scale Disasters." In Jacqueline MacCauley and David Horton Smith (eds.), Handbook of Informal Participation. San Francisco: Jossey-Bass. (with E. L. Quarantelli).
6. 1978 "Interorganizational Relations in Communities Under Stress." Pp. 50-64 in E. L. Quarantelli (ed.), Disasters: Theory and Research. London: Sage Studies in Sociology.
7. 1977 "Crises and Disaster Research." In Annual Review of Sociology. Volume 3. Palo Alto: Annual Reviews Inc. (with E. L. Quarantelli).
8. 1976 Organizational Communications and Decision Making in Crises. Columbus: Disaster Research Center. 53 pp. (with E. L. Quarantelli).
9. 1976 "The Family and Community Context of Individual Reactions to Disaster." Pp. 231-245 in H. J. Parad, H. L. P. Resnick, and Libbie Parad (eds.), Emergency and Disaster Management. Bowie: Charles Press Publishers. (with E. L. Quarantelli).
10. 1976 "Emergency Disaster Plans for Vocational Schools." Pp. 151-161 in Developing the Leadership Potential of Urban Vocational Education Administrators. 1976 National Leadership Seminar for Administrators of Vocational Education in April. (with E. L. Quarantelli).
11. 1975 "Rapport sur les activities du Disaster Research Center." Pp. 23-44 in Les Comportements Associes Aux Catastrophes. (Table Ronde du Centre National de la Recherche Scientifique) Paris: Institut International du Feu. (in French and English) (with E. L. Quarantelli).
12. 1975 The Delivery of Mental Health Services in the Xenia Tornado. Columbus: Disaster Research Center. 280 pp. (with E. L. Quarantelli and others).
13. 1974 The Role of Local Civil Defense in Disaster Planning. Report Series No. 16. Columbus: Disaster Research Center. 105 pp. (with E. L. Quarantelli).

14. 1974 "Police Perspectives and Behavior in a Campus Disturbance." In Donal MacNamara and Marc Riedel (eds.), Police: Perspectives, Problems and Prospectives. New York: Praeger. (with E. L. Quarantelli and James L. Ross).
15. 1974 "Organizations as Victims in American Mass Racial Disturbances: A Reexamination." Pp. 121-142 in E. C. Vivano and Israel Drapkin (eds.), Victimology. Volume 4. Lexington: D. C. Heath. (with E. L. Quarantelli).
16. 1972 Police Perspectives and Behavior in a Campus Disturbance. Columbus: Disaster Research Center. 166 pp. (with E. L. Quarantelli and James L. Ross).
17. 1972 "Police Department Planning for Civil Disturbances: Organizational Factors Involved in Changes." Pp. 76-88 in F. Adler and G. O. W. Mueller (eds.), Politics, Crime and the International Scene: An Inter-American Focus. Hato Rey, PR: North South Press. (with M. Brooks and E. L. Quarantelli).
18. 1972 A Perspective on Disaster Planning. Report Series No. 11. Columbus: Disaster Research Center. 94 pp. (with E. L. Quarantelli and Gary Kreps).
19. 1972 "Cross Cultural Perspective on Disaster." Pp. 235-257 in Proceedings of Japan-United States Disaster Research Seminar: Organizational and Community Responses to Disaster. Columbus: Disaster Research Center.
20. 1971 Environment Crises. Columbus: Water Resources Center, The Ohio State University. 91 pp. (with Dennis Wenger).
21. 1971 "Community Conflict: An Explanation of Its Absence in Natural Disaster." In Clagett G. Smith (ed.), Conflict Resolution: Contributions of the Behavioral Sciences. Notre Dame: University of Notre Dame Press. (with E. L. Quarantelli).
22. 1970 "Different Types of Organizations in Disaster Response and Their Operational Problems."

- In Robert Brictson (ed.), Emergency Operations. Los Angeles: Tinnen-Brown. (with E. L. Quarantelli).
23. 1969 Organized Behavior in Disaster: Analysis and Conceptualization. Columbus: Disaster Research Center. 254 pp. (Republished 1970. Lexington: D. C. Heath).
24. 1969 The Functioning of Expanding Organizations in Community Disasters. Report Series No. 2. Columbus: Disaster Research Center. 82 pp.
25. 1969 Community Priorities in the Anchorage, Alaska Earthquake, 1964. Monograph Series No. 4. Columbus: Disaster Research Center. 173 pp. (with Daniel Yutzy, major author, and William Anderson).
26. 1968 "Operational Problems of Organizations in Disasters." Pp. 151-176 in 1967 Emergency Operations Symposium. Santa Monica: System Development Corporation.
27. 1968 The Functioning of Established Organizations in Community Disasters. Report Series No. 1. Columbus: Disaster Research Center. 52 pp. (with George Warheit).
28. 1964 "Some Preliminary Observations of the Response of Community Organizations Involved in the Emergency Period of the Alaskan Earthquake." Working Paper #2, Disaster Research Center, 28 pp. (with J. E. Haas and E. L. Quarantelli).
29. 1964 "Some Preliminary Observations in Organizational Responses in the Emergency Period after the Niigata, Japan Earthquake of June 16, 1964." Research Report #11, Disaster Research Center, 49 pp. (with J. E. Haas and E. L. Quarantelli). (Republished in entirety in Japanese by Japanese Government).
30. 1956 Consequences of Population Mobility for School and Community Change. Columbus: School-Community Development Study, The Ohio State University. 132 pp.

31. 1951 Homes for the Homeless in Tennessee.  
Knoxville: The University of Tennessee. Publication of the Bureau of Sociological Research, The University of Tennessee Record Extension Series, Volume 27, No. 4, 67 pp. (with William E. Cole).

Articles:

1. 1978 "Organizational Adaptation to Crises." Disasters, Volume 3, No. 1, March. London: International Disaster Institute. (with Benigno Aguirre).
2. 1977 "A Background Note on the Preliminary Findings and Impressions of the DRC Studies." Mass Emergencies 2:147-150.
3. 1976 "The Impact of Devotionalism and Attendance on Ordinary and Emergency Helping Behavior." Journal of Scientific Study of Religion 15:47-59 (March). (with Lynn Nelson).
4. 1976 "Community Conflict: Its Presence and Absence in Natural Disaster Situations." Mass Emergencies 1:139-152. (with E. L. Quarantelli).
5. 1975 "Civil Disturbances and Social Change: A Comparative Analysis of the United States and Curacao." Urban Affairs Quarterly, September. (with William Anderson).
6. 1975 "The Comparative Study of Disaster: A Social Organizational Approach." Mass Emergencies 1:21-31.
7. 1974 "Police Perspectives and Behavior in a Campus Disturbance." Journal of Police Science and Administration 2:344-351. (with E. L. Quarantelli and James L. Ross).
8. 1974 "Counter rioters in Urban Disturbances: Opponents or Supporters of the Status-Quo?" Society 11:50-55 (March-April).
9. 1973 "Organizational and Political Transformation of a Social Movement: A Study of the

- 30th of May Movement in Curacao." Social Forces 51:330-341. (with William Anderson).
10. 1972 "When Disaster Strikes (It Isn't Much Like What You've Heard About)." Psychology Today 5:66-70 (February). (with E. L. Quarantelli).
  11. 1970 "Property Norms and Looting: Their Patterns in Community Crises." Phylon 31:168-182 (Summer). (with E. L. Quarantelli).
  12. 1970 "Organizational Involvement and Changes in Community Structure in Disaster." American Behavioral Scientist 13:430-439.
  13. 1970 "Organization as Victim in Mass Civil Disturbances." Issues in Criminology 5:181-193 (Summer). (with E. L. Quarantelli).
  14. 1969 "Looting Patterns in Community Disasters and Disturbances." Proceedings of the Third National Symposium on Law Enforcement and Technology. Chicago: IIT Research Institute. pp. 323-327 (with E. L. Quarantelli).
  15. 1969 "Organizations in Disaster." EMO National Digest 9:12-13 (April-May). (with George Warheit).
  16. 1969 "Dissensus and Consensus in Community Emergencies: Patterns of Looting and Property Norms." IL Politico, Revista di Science Politiche 34:276-291. (with E. L. Quarantelli) (includes an Italian summary).
  17. 1968 "Redefinitions of Property Norms in Community Emergencies." International Journal of Legal Research 3: 100-112 (December). (with E. L. Quarantelli).
  18. 1968 "Looting in Civil Disturbances and Disasters." Trans-Action 5:9-14 (May). (with E. L. Quarantelli).
  19. 1968 "Looting in Civil Disorders: An Index of Social Change." The American Behavioral Scientist, Volume 2, March. (with E. L. Quarantelli).

20. 1968 "Group Behavior Under Stress: A Required Convergence of Organizational and Collective Behavior Perspectives." Sociology and Social Research 52:416-429. (with E. L. Quarantelli).
21. 1968 "Collective Stress and Its Relation to Water Resource Planning." Proceedings of Workshop on Sociological Aspects of Water Resources Research, Utah State University.
22. 1967 "Societal and Community Problems in Disaster." EMO National Digest 7:16-18 (October).
23. 1967 "Impact of Disaster on Community Life." EMO National Digest 7:10-13 (April).
24. 1967 "Administrative, Methodological and Theoretical Problems of Disaster Research." Indian Sociological Bulletin 4.4: 215-227 (July). (with E. L. Quarantelli and J. E. Haas).
25. 1966 "Theoretical Problems in Disaster Research." Bulletin of Business Research 41:7-9 (September).
26. 1966 "Natural Disaster as a Social Science Field." National Review of the Social Sciences 3:85-94. (also summary in Arabic).

Editing:

Editor, ASA Footnotes, 1977-Present.

Reviewer for a number of journals ranging from Journal of Scientific Study of Religion to Science.

Co-Editor, Disaster Research Center Series.

Co-Editor, Special Issue, "Dynamics of Organizational Involvement and Change in Civil Disturbances," American Behavioral Scientist, Volume 16, No. 3 (January-February), 1973.

Co-Editor, Special Issue, "Organizational and Group Responses to Community Disaster," American Behavioral Scientist, Volume 13, No. 3 (January-February), 1970.

Editor, Consultant on social problems  
concepts, Dictionary of Modern  
Sociology, Littlefield, Adams and  
Co., 1969, Thomas F. Hoult, ed.

1                   MR. ZAHLER: Dr. Dynes is available for  
2 cross-examination.

3                   CHAIRMAN SMITH: You have raised -- you people  
4 have put yourselves in a spot, haven't you? You made  
5 objections, but then you assumed you were going to win and  
6 you have not filed cross-examination plans.

7                   MS. GAIL BRADFORD: It is buried, sir, inside the  
8 plan submitted. There, you have it.

9                   CHAIRMAN SMITH: I have it.

10                  (Board conferring.)

11                  CHAIRMAN SMITH: Before we start the  
12 cross-examination, there are two, as I understand it from  
13 Mr. Brenner -- I have not had a chance to read the papers  
14 that you filed. But as I understand it, there are two sets  
15 of cross-examination plans submitted by the Intervenors  
16 today.

17                  MS. GAIL BRADFORD: Yes, sir.

18                  CHAIRMAN SMITH: How does that -- how do you  
19 reconcile that with the very strong admonition by the Board  
20 that we would not accept that approach --

21                  MS. GAIL BRADFORD: Sir --

22                  CHAIRMAN SMITH: -- unless there is a strong  
23 showing that you cannot join in your approach?

24                  MS. GAIL BRADFORD: Sir, I prepared a plan and Mr.  
25 Cunningham prepared a plan. And I will do both plans, and I

1 will incorporate the one into the other.

2 CHAIRMAN SMITH: You made that point and I did not  
3 appreciate it. All right, thank you.

4 (Board conferring.)

5 CHAIRMAN SMITH: Certainly we have no objections  
6 to Ms. Bradford and Mr. Cunningham joining together as  
7 counsel for Intervenor and asking questions along your  
8 cross-examination plans and assisting each other, I mean,  
9 asking questions alternatively. We have had very relaxed  
10 rules on that. So long as the cross-examination is not in  
11 the form of unfair double-teaming, we allow that. So you  
12 are free to work together as a single approach. I did not  
13 mean to suggest to the contrary.

14 It is just that you have to consolidate your  
15 approach so as to avoid cumulative and repetitive  
16 cross-examination.

17 (Board conferring.)

18 CHAIRMAN SMITH: All right. You may proceed.

19 CROSS-EXAMINATION .

20 BY MS. GAIL BRADFORD:

21 Q Dr. Dynes, do you feel that the local county plans  
22 involve too many specifics in order to be effective in the  
23 event of an emergency?

24 A I am sorry, I did not --

25 Q Dr. Dynes, do you feel that the local county plans

1 in the Three Mile Island area involve too many specifics in  
2 order to be effective in the event of an emergency at TMI?

3 A Well, as I indicated in terms of this --

4 Q I cannot hear you.

5 A You can't hear either? All right.

6 My concern here, what I was asked to do was  
7 essentially to talk about general principles of planning and  
8 not -- and again, I did not see my responsibility as  
9 evaluating essentially the local plans. Other testimony  
10 will do that.

11 I would say as a general rule that very often  
12 local plans are overdetailed, if you will.

13 Q I guess I am wondering where you draw the line  
14 between overdetailed and not detailed enough. And I would  
15 like you to speak to our plans to see where they fall in  
16 your scale.

17 A All right. Essentially, plans focus on certain  
18 principles of organization, rather than embedding -- I think  
19 a good concrete example which very often happens is that  
20 particular names and phone numbers very often get into  
21 plans, which are quickly outdated if they are not -- if  
22 there are not details or at least provisions in the plans  
23 for constantly updating these.

24 Essentially, you are much better to express  
25 certain principles in terms of positions in organizations

1 rather than individuals.

2 CHAIRMAN SMITH: As I understand your answer, this  
3 is a general answer and not directed to the York County  
4 plan.

5 THE WITNESS: Right.

6 CHAIRMAN SMITH: Which as I understand you have  
7 not reviewed.

8 THE WITNESS: I glanced over an earlier version.  
9 I was familiar with it before the incident, but I am not  
10 with the final version. I was not asked to do that.

11 (Counsel for ANGRY conferring.)

12 BY MS. GAIL BRADFORD: (Resuming)

13 Q Sir, what is your experience on planning for a  
14 nuclear accident evacuation?

15 A Well, my experience on emergency planning, in  
16 which nuclear accidents is only one part of that, is very  
17 broad. In other words, we are talking about types of  
18 community crises, which might involve all the way from  
19 natural disasters to chemical threats to nuclear threats.

20 My experience goes back at least to 1964 in  
21 studying a variety of types of incidents to try to determine  
22 their similarities and differences, ranging all the way from  
23 Alaskan earthquake to Indianapolis Coliseum fire to the  
24 civil disturbances in Detroit, work in Japan, Iran, Greece,  
25 plus heading a center that did research on probably every

1 major incident, particularly in the United States, since  
2 1964.

3 CHAIRMAN SMITH: Dr. Dynes, I wonder if I could  
4 interrupt you here for efficiency. I think it would be very  
5 helpful, rather than give examples, if you gave a listing of  
6 the disaster situations that you have evaluated. I mean, I  
7 understand that would be quite a long list. So be somewhat  
8 selective, but give us a greater list of examples.

9 \* THE WITNESS: I have to differentiate in part  
10 those where I did personal field work as opposed to work at  
11 the center. As I say, the work at the center, certainly  
12 over 120 or 130 by this time.

13 In terms of my own specific experience, I was  
14 trying to think those out. You tend to forget them over a  
15 period of time.

16 The Alaskan earthquake; a number of hurricanes on  
17 the Gulf Coast, Agnes, Betsy, and one earlier than that;  
18 essentially, looking at earthquakes in Japan, Iran, Greece;  
19 civil disturbances in the Caribbean and several American  
20 cities and so forth.

21 So the point I am trying to make is, looking at a  
22 wide variety of types of community emergencies, and I see  
23 community emergency as more of a generic process than the  
24 specific agent. In many cases, it is irrelevant to the  
25 types of planning that it is needed to do for an emergency.

1           But to be more specific, your question, at least  
2 the Disaster Research Center at Ohio State, where I was  
3 associated for a long time, was essentially the major source  
4 of research primarily for those periods of years. It still  
5 continues. I am no longer associated with the center, but  
6 it still exists. And I usually try to keep up with the  
7 literature that is going on.

8           MR. ZAHLER: If I could interject for a second. I  
9 do not know for whatever reason, but you left out your  
10 experience with respect to TMI, and you might want to  
11 describe that.

12           THE WITNESS: Well, I was the head of the task  
13 force on emergency preparedness for the President's  
14 Commission on Three Mile Island. So I do have some  
15 familiarity with both the specific instance -- but again,  
16 looking at preparedness before that -- and also, the  
17 response at that particular time.

18           CHAIRMAN SMITH: Could you elaborate somewhat upon  
19 -- quantify, if you can, the amount of involvement you had  
20 in the President's -- on the task force?

21           THE WITNESS: Well, I headed one of the task  
22 forces. As I recall, there were five. There were five task  
23 forces: the emergency preparedness, public health, the  
24 right to know, and the public information, and the other one  
25 was the in-plant activity. So it was one of five task

1 forces.

2 I chaired that task force, and it was probably the  
3 smallest one of the task forces, as I recall. We did start  
4 a little bit late in the course of the Commission. As some  
5 of you might recall, the President's Commission initially  
6 started essentially as an accident investigation and tended  
7 to broaden out. And I suppose I was brought in at one point  
8 when they were broadening out in the emergency planning. At  
9 least to my knowledge, that was initially -- they had not  
10 intended to go in that direction, but they did tend to go in  
11 that direction toward the end of the Commission time.

12 As I recall, the Commission really got organized  
13 in May, and I think they approached me some time in June.  
14 And I worked primarily in July and August, and I thought I  
15 was going to be through by then, but into September and  
16 October, that time.

17 CHAIRMAN SMITH: We are not going to hold you to  
18 the cross-examination plan in your cross-examination. You  
19 can cross-examine in any appropriate area.

20 BY MS. GAIL BRADFORD: (Resuming)

21 Q Is your experience with nuclear accident  
22 evacuations limited to your experience with the Three Mile  
23 Island accident two years ago?

24 A Is my experience with the evacuation limited to  
25 TMI?

1       Q     Nuclear accident evacuations. That was what my  
2 original question was, was what your experience related to.

3       A     No, not necessarily. Over the period of years we  
4 looked at nuclear incidents in the center.

5       Q     Could you explain a bit more about that?

6       A     Well, essentially, one that I recall offhand was  
7 an explosion and fire in a nuclear dump in San Antonio.  
8 This was back in '65, I think it was.

9                 (Pause.)

10      Q     Do you find that different categories of accidents  
11 or natural occurrences elicit different kinds of reactions  
12 in the populations affected? For instance, do people have a  
13 different kind of reaction to a flood than they might to an  
14 earthquake or a riot or whatever?

15      A     Well, the answer to that isd yes and no, in this  
16 sense. All agents have certain things similar. In fact --  
17 in fact, it is not very useful to classify them according to  
18 the way that you did in terms of nuclear accidents versus  
19 something else.

20                 Obviously, those types of disaster agents or  
21 crisis agents that permit warning are more similar than  
22 those that do not. And there are a number of different  
23 criteria which one can utilize to classify things. For  
24 example, an earthquake is very similar in the sense of speed  
25 of onset and lack of warning to something like a tornado,

1 but it is not similar to a hurricane because you have a  
2 period of warning in that, even though the hurricane and the  
3 tornado also have water with them.

4           So you have to single out what criteria you are  
5 looking at, and generally to classify them in terms of a  
6 nuclear accident versus somethin; else you would have to  
7 say, what are the characteristics of the other thing. For  
8 example, a nuclear plant accident is essentially a fixed  
9 site rather than a diffused type of damage that you would  
10 get in an earthquake.

11           So the point is that disaster agents have a number  
12 of characteristics. You can compare a number of things that  
13 seem to be dissimilar and look at the similarities, whether  
14 it is warning, the onset, the degree of damage and so forth  
15 and so on.

16           Q     Could you categorize for us where a nuclear  
17 accident which might result in an evacuation would fall in  
18 those characteristics?

19           A     Well, I am not sure how you want to classify it.  
20 If you want to describe it, it is essentially -- it is a  
21 fixed site, in which -- you could have the possibilities for  
22 warning. And also, it may be that in certain instances you  
23 would not. So that it has a number of attributes. And it  
24 has a single source.

25           In one sense I suppose it is more similar than to

1 other types of -- let's say an explosion. It would be  
2 similar in the sense it would be at one particular point.

3 Q One feature I would just mention and ask if you --  
4 what you think of it is, is that the characteristics  
5 particularly of radiation and people's perception of  
6 radiation, especially in that it is not detectable by a  
7 person's senses, you would not -- you do not know whether  
8 you are being affected by radiation.

9 A Well, that is true. But it is also true of other  
10 -- for example, that is true of epidemics.

11 Q So you say it might be similar to an epidemic, but  
12 it might not be similar to --

13 A In certain ways, if you stay on that criteria, it  
14 is similar. If you shift criteria, then you move to  
15 something else.

16 Q In the way that the characteristic of the spread  
17 of radiation might be thought to be, that people do not  
18 sense it directly, an accident situation from a nuclear  
19 accident might be like an epidemic, but not like a flood,  
20 where you can see the water or --

21 A In that one attribute, yes.

22 Q What other types of disaster events is it not like  
23 in that one attribute?

24 A Well, something that you could perceive,  
25 weather-related cues, for example, although in certain

1 instances even weather is deceptive. For example, tornadoes  
2 do not always occur -- you do not get good clues on that to  
3 perceive that. We are generally taught that tornadoes are  
4 accompanied by black clouds.

5           But at least I can point to a number of tornadoes  
6 that do not operate in that way. In fact, one of the  
7 greatest death rates we have had in the United States  
8 occurred on Easter Sunday, I think it was '65, in Indiana,  
9 when it was a beautiful Easter day and there was plenty of  
10 warning. But people said -- looked up and said, this cannot  
11 be a day where we have tornadoes.

12           So that the perception of threat, if that is what  
13 you are getting to, is always -- I think it is always  
14 problematic, in all instances. Some things are more obvious  
15 than others, but it is too problematic to essentially  
16 determine the meaning of particular threats.

17           And part of this comes about by public education,  
18 giving persons clues as to how they can determine what is  
19 happening or what is going to happen to them.

20       Q     In the Easter Sunday example you gave -- I do not  
21 know where the place was, so I will call it the Easter  
22 Sunday example -- there the population was informed --

23       A     Yes.

24       Q     That a tornado was coming, and yet they did not  
25 believe it because their senses did not confirm that?

1       A      Right.

2       Q      Do you think that that situation might be similar  
3     to a nuclear accident evacuation where the population is  
4     told that there is a danger, but they have no way of  
5     perceiving directly that there is a danger?

6       A      No, I do not think -- I do not think a threat has  
7     to necessarily be perceived in that way. We are talking in  
8     visual terms. I think you can be assured that, even though  
9     one cannot see it, that there is danger involved there. And  
10    all I am saying is that people in this instance, this  
11    illustration we are using -- that there was a general notion  
12    that somehow tornadoes were only associated with particular  
13    cloud notions, and there was an additional complicating  
14    factor along this line.

15           And while there was warning, this also happened to  
16    be on a Sunday afternoon. And if you know the operation of  
17    radio stations in Indiana, Sunday afternoon the disc jockey  
18    is also the newsman and also the engineer. And so they were  
19    not keeping track of telex messages that were coming  
20    through.

21           So that while in one sense -- warning is never  
22    complete. I suppose that is the best way to say it. There  
23    was indication and notification from the Weather Bureau at  
24    that time, which often or sometimes did not get channeled.  
25    And also, the Weather Bureau at that time I think was not as

1 sophisticated in trying to interpret what that meant, in  
2 other words, what you would see when you had a tornado  
3 watch.

4 And I think, to go one step beyond, that we know a  
5 lot more about the warning process and how we need to  
6 communicate a number of things at this particular point.  
7 That was 15 years ago.

8 Q On the Easter Sunday example 15 years ago, is it  
9 not true that people chose to believe their own perceptions  
10 and ideas and preconceived notions, rather than the  
11 information that they were receiving by the radio?

12 A Well, in all types of threat situations there is a  
13 tendency to normalize, in other words to make it normal.  
14 And warning very often has to overcome that. In other  
15 words, if for example in this particular room, if I told you  
16 that the ceiling was going to fall in, you would probably  
17 ignore me at that particular point, because that would be  
18 uncomfortable for all of us.

19 So we tend to ignore those types of things until  
20 we get confirming evidence. In other words, if you got hit  
21 on the head with a piece of concrete, then you would --  
22 there would be some element of belief along that line. And  
23 people go through a long, involved process.

24 They do it with any type of agent, not just in  
25 terms of nuclear agents. Because in a sense we do not like

1 to -- our perception of reality is difficult to disturb, so  
2 to speak, and we are much more comfortable with it being the  
3 way we think it is.

4 And it takes a lot to sort of shift our attention  
5 away that something is wrong.

6 (Counsel for ANGRY conferring.)

7 Q How do you go about studying whether an evacuation  
8 plan -- or how should we go about studying whether our  
9 evacuation plans meet your criteria? How do you conduct a  
10 study?

11 CHAIRMAN SMITH: That is Dr. Dynes' criteria?

12 MS. GAIL BRADFORD: Yes.

13 THE WITNESS: Well, I think that perhaps one place  
14 to start is that evacuation -- let me answer generally and  
15 come back. Evacuation is not a new phenomenon. People do  
16 it all the time.

17 In fact, at least one estimate on that suggests  
18 that there is a need for evacuation in the United States  
19 every week, which occurs. And all the way from, you know,  
20 50 people to, I do not know -- Guiness does not keep records  
21 on this. But I do recall that Texas, there was one  
22 evacuation where the estimate was a half a million people  
23 evacuated.

24 Now, the point on that is, we have a reasonable  
25 amount of evidence in terms of actually what has happened in

1 the past. And one of -- one of the things -- the reason I  
2 am mentioning this, one of the things that you do in  
3 planning is to look at those situations and look at the way  
4 in which people behaved and did behave and how they  
5 behaved.

6 So there is a good -- there is a good backlog of  
7 actual incidents. There is an increasing amount of research  
8 on evacuation, how people go about deciding to evacuate, and  
9 so forth and so on. So there is that research base.

10 So I think that planners, those people in counties  
11 and states who are involved in planning, should know that,  
12 essentially that research base.

13 One of the points that I made in my statement,  
14 which I think is very critically important here, is that  
15 planning for evacuation or planning for any type of  
16 emergency action should be based upon sort of everyday  
17 routines, in other words, logical extensions of what you  
18 do. And so that -- an adequate local plan would be one  
19 which is based upon essentially a knowledge of the local  
20 community and its rhythms and its activities and its  
21 population.

22 And that is why general principles like I suggest  
23 have to be applied to the local area in terms of people who  
24 are knowledgeable about that particular type of community.  
25 The resources that you are going to be utilizing in a

1 community are those that are already there in place. And so  
2 if you -- if the whole -- the important process in emergency  
3 planning is essentially trying to figure out ways in which  
4 the resources that you already have can be rearranged for  
5 the new problem that you have.

6 Now, maybe one other comment on that. Sometimes  
7 -- and this is a general criticism of emergency planning --  
8 sometimes there is a tendency for planners to overplan, in a  
9 sense to sort of assume that everybody is rather stupid. In  
10 other words, to tell me things that I know anyway, or tell  
11 me things that I know how to do better.

12 That -- and the bottom line in this, I think that  
13 very often people underestimate the initiative and the  
14 ability of people to cope with problematic situations. In  
15 other words, I think that in the specific example of  
16 evacuation, that we need to do a good job in warning, but  
17 also we do not have to underestimate the intelligence of  
18 people in knowing what to do and where to go.

19 For example, we know in most evacuations, to make  
20 a long story longer, we know in most evacuations that people  
21 take care of themselves. For example, public shelters are  
22 minimally used. They go to relatives, they make their own  
23 way to go.

24 So the point is that I think any type of planning  
25 should not underestimate the intelligence of the local

1 population.

2 BY MS. GAIL BRADFORD: (Resuming)

3 Q Would you think that the routines that people  
4 normally go through, whatever those are, are routines that  
5 they would, even irrationally or just through force of  
6 habit, go through in the event that they were ordered to  
7 leave their homes? They might go through whatever -- or a  
8 modified version of whatever they go through whenever they  
9 normally go on a trip?

10 A Let me use a specific example to try to answer  
11 that. The use of school buses along normal routes is a very  
12 good adaptation of a routine pattern. What would be very  
13 bad would be if you changed those school bus routes to  
14 something new in the emergency.

15 Q Yes.

16 A All right. So what you need to build upon,  
17 everybody is used to -- at least parents who have kids on  
18 school buses are used to that schedule. So, given that,  
19 then build your emergency planning on those types of  
20 routines that already exist, rather than creating artificial  
21 ones that nobody knows about.

22

23

24

25

1           Q     If, say, a family when it prepares for its regular  
2 summer vacation always checks the car out, puts gas in the  
3 tank, and air in the tires, and finds maps, and, you know,  
4 all those little routines that you go through that take so  
5 long on the first day of the vacation, would they go through  
6 some of those or all of those, or what do you think a  
7 family's habits would be in the event of an emergency  
8 evacuation?

9           A     Well, I think you would have to -- obviously there  
10 are some families, I would assume, that let's say, keep gas  
11 at home or would have those things available. Maybe you  
12 could increase those resources, but I think that they would  
13 -- they would worry about the things that they normally  
14 worry about, and they would utilize the resources that they  
15 have available at that particular time.

16                 And maybe I should say that again we should not  
17 underestimate the resources that individual families have.  
18 Take a specific example that does not really apply, but in  
19 terms of evacuation certainly I am always astonished at how  
20 many Coleman stoves exist in this society and how functional  
21 they are in hurricanes, because electric power goes first,  
22 but people do not have any major problems with cooking  
23 because of the availability of Coleman stoves.

24                 So that there are a lot of resources that are  
25 available at the family level which can be utilized in types

1 of emergencies to help them move out or help them evacuate,  
2 if you will.

3 Q Could you give us an opinion, if a local  
4 population were instructed to take shelter for a given  
5 amount of time, do you think that they would take shelter,  
6 or would assume that something worse was going to happen so  
7 would disobey instructions and jump in the car, or what do  
8 you think people's reaction to that would be?

9 A I think if it were presented as a rational safety  
10 measure and the reasons for its presented, and the  
11 consequences of not observing it, you'd get pretty high  
12 compliance on that.

13 Q That you would say from your general experience?

14 A Yes.

15 Q Have you studied any cases in which sheltering was  
16 ordered and was taken?

17 A Well, very often hurricanes.

18 Q Yes.

19 A Are -- at least one adaptation to hurricanes are  
20 shelter and also tornadoes in which that is a rational  
21 instruction in that particular case. Also, particularly in  
22 planes, evacuation is another possibility. These are  
23 essentially alternative safety measures that are appropriate  
24 at particular times and in particular places.

25 Q Do you think people react with more or less panic

1 to some danger that they cannot perceive or that they cannot  
2 confirm with their own senses?

3           A     Well, I do not like the word "panic," because I  
4 think it does not describe what happens in emergencies.  
5 Panic is a very rare phenomenon found mostly in the movies,  
6 and that I think there are difficulties in terms of  
7 perception.

8                 But going back to what we said earlier, even  
9 things that are hard to see can be perceived in particular  
10 ways, and there are even difficulties in what one would  
11 think as a fairly obvious thing in perceiving.

12              Let me give you a specific example. In most of  
13 the Gulf hurricanes they come into the Gulf Coast at 120  
14 miles an hour. These are people, therefore, on the Gulf  
15 Coast -- they define a hurricane in terms of 120 miles an  
16 hour.

17               In Carlisle I think it was I may have -- one of  
18 them came in at 190. Now, the difference between 120 and  
19 190 in terms of destructiveness is at least double, and that  
20 is a difficult thing to explain, in other words,  
21 particularly to somebody who is used to a 120 miles saying  
22 that it is coming in at a little bit more, and they think  
23 that it is just a little bit bigger.

24               So you have the problem of conveying to the public  
25 the meaning of particular types of agents and particular

1 types of effects, and that is a problem of public  
2 information and how you communicate to people in particular  
3 ways.

4           But I think to go back to your point that people  
5 want this type of information, and not only want it to know  
6 instructions of how they can take preventive actions, not in  
7 any complicated sense but in the sense that these are things  
8 that are likely to happen; this is what the effect is; this  
9 is how you can avoid those effects. And public information  
10 can be a relatively simple process, not a very complicated  
11 process.

12         Q     Do you feel that people react with more irrational  
13 behavior patterns or take a longer time when they do not  
14 understand the threat that they are exposed to?

15         A     Not really. You see, the major problem in most  
16 types of emergencies, it is not the fact that people behave  
17 irrationally; it is to do get them to do anything. In other  
18 words, it is essentially to prompt them to take preventive  
19 action, and you know, it is not the Hollywood image that  
20 people are going to run out of the area leaving everything  
21 behind. It is the fact of getting them to take certain  
22 types of action.

23         Q     Is that true in an area where they have been asked  
24 to take that sort of action previously; for instance, in an  
25 area which repeatedly has hurricanes are people better at --

1 do they react more? What is the change in reactions?

2 A That is a good question. There is almost a dual  
3 answer to it. Sometimes they become too cynical like our  
4 Gulf Coast example. In other words, they know what a  
5 120-mile an hour hurricane is, and therefore, they base  
6 their behavior on it.

7 But I think by and large if you -- in other words,  
8 if you have gone through -- take the Gulf Coast as an  
9 example. If you have gone through an evacuation there, you  
10 know -- you have done it before; it is like a drill, and you  
11 can do it again and realize that you can probably correct  
12 some of your minor mistakes from last time.

13 (Counsel for ANGRY conferring.)

14 Q Is it your position that regardless of the  
15 disaster history of a particular area or the events that may  
16 have happened in that area, that all areas will react in a  
17 similar fashion when responding to an emergency?

18 A Well, I would not state it in that way. Again, I  
19 would go back to the question that there are certain --  
20 there are certain uniformities that cut across particular  
21 events, and I am always impressed by the similarities rather  
22 than the minor differences.

23 There are certain universals. I was thinking of  
24 earlier the fact that every local area somehow thinks they  
25 are different. That seems to be universal. Okay.

1 Q Sir, I am having some trouble with the responses  
2 in that I need to know yes or no to my questions, and you  
3 often answer about something I did not really ask about.  
4 You are welcome to elaborate on the answer, but I wish you  
5 would also answer the question.

6 A I am sorry. What was your question?

7 Q Is it your position that regardless of past  
8 experience of an area, all areas react in a similar fashion?

9 A Areas do not react; people do.

10 Q All right.

11 A Okay.

12 Q With that correction what is your position?

13 A I think, as I said, the impressive thing is the  
14 similarities, yes. There is a fairly universal cut across  
15 all types of agents. Evacuation here, for example, the  
16 evacuation studies that looked at the evacuation of TMI were  
17 very consistent with evacuation studies for other types of  
18 agents.

19 Q Could you tell us what are the universals and how  
20 they were similar?

21 A How they were similar? For example, they  
22 evacuated with family units. They did not depend upon  
23 public shelters. Essentially the process of decisionmaking  
24 was essentially the same as you would find in any other type  
25 of incidents.

1           TMI was not unique in the sense that there was  
2 contradictory information. That is also true in a number of  
3 other types of events. So people would go through  
4 essentially confirming experiences in terms of saying to  
5 check with neighbors, to check with relatives, and saying  
6 well, you know, we have heard discussion about that we  
7 should evacuate, what do you think? And so this is a very  
8 typical process.

9           People listen to the radio, listen to television,  
10 listen to their neighbors, talk to people on the street; and  
11 the process by which people decided to evacuate was  
12 essentially identical.

13           So you had, if I recall the studies, there were  
14 some figures that suggested up to 60 percent of people in at  
15 least the five-mile area did evacuate during that period of  
16 time. So all of those processes of decisionmaking were  
17 similar. The mode in which people went -- left was similar,  
18 where they went was similar.

19           As I recall, there was one minor difference in  
20 this, that people seemingly evacuated a little bit further  
21 than they did in other instances, and I think primarily  
22 because of this that the peak evacuation was a Friday  
23 afternoon, and people combined it with the weekend to go see  
24 their relatives over in New Jersey. So that made the mean  
25 length of evacuation a little bit more than you would find

1 in other instances.

2           But all those other things are similar. The fact  
3 that people go to relatives, I don't mean to imply that that  
4 is unique; that is very common.

5           Q     I was interested in something you said at the  
6 beginning of your answer. In your professional opinion is  
7 there a delay reaction to an emergency warning because  
8 people talk to their neighbors and consider what to do?

9           A     No. Well, it is not delayed in the way that you  
10 suggest. It is what I talked about a minute ago. People go  
11 through a confirming experience.

12          Q     What do they do?

13          A     They talk to other people. You go back to my  
14 example of the ceiling, if the ceiling falls down. If other  
15 people -- one usual response to that would be to look up at  
16 the ceiling. The other would be, you know, if you saw  
17 something, would be to say well, what is that, an aberration  
18 along this line. So people go through a searching process  
19 of essentially trying to figure out both what has happened  
20 and also what they are going to do about it, and it takes  
21 some time. It takes a wide variety of information on this.

22           CHAIRMAN SMITH: Are you suggesting that there has  
23 to be a consensus among the population at risk before they  
24 are prepared to take action?

25           THE WITNESS: No, not any more than any other

1 family decision. Sometimes you have to drag people -- you  
2 know, people will say I will go because everybody else is  
3 going. But at least it is generally a family decisionmaking  
4 process, right, and not all of them probably are equally  
5 enthused about taking that particular action.

6 BY MS. GAIL BRADFORD: (Resuming)

7 Q Have you done studies of how long a family takes  
8 to make that kind of decision?

9 A No. It depends on the clues that they get  
10 earlier; in other words, what the degree of ambiguity there  
11 is. I am trying to go back in the incident here, but there  
12 were several days in which there was conflicting  
13 information. All right. And I think Friday, as I recall  
14 back on those studies, that the peak period of evacuation in  
15 this area was Friday night; and I think that followed -- I  
16 think that followed the confusing message of 1:00 in the  
17 afternoon. And I would project what happened is that people  
18 got back from work, and somebody talked about earlier  
19 disinformation and somebody says well, it is Friday night; I  
20 don't have to work tomorrow. Let's go. So they went.

21 Q Would you say that the length of time it took the  
22 family to reach a decision like this depends upon their  
23 perceptions?

24 A Well, it depends upon the information they have.  
25 It depends upon how they perceive -- how much they perceive

1 it affects them and how much they believe in the warning.

2 Q What input would they have in that, in what you  
3 say about perceptions?

4 A Walter Cronkite is gone, but he will be replaced  
5 by somebody else. You have the media, you have neighbors,  
6 you have weather -- if you were dealing with other  
7 incidents, you have weather cues.

8 Q And also their own personal experiences.

9 A Sure, sure. As to what all these things mean.

10 Q Have you ever figured out how people balance all  
11 that?

12 A No, not any more than -- they do it in the same  
13 way of making other types of decisions; I mean, in buying a  
14 car and that type of thing.

15 Q Have you ever made a study of how long that  
16 decisionmaking process takes?

17 A No, because it would vary with the types of  
18 information that the people are getting. In other words, if  
19 you -- let's take a specific example. Well, even in  
20 something -- even in something like an explosion it still  
21 takes some time to figure out what happened -- that is not a  
22 simple question -- and how it might affect me, or a fire,  
23 all these things. It depends upon the types of information  
24 that you have from other sources. In other words, if the  
25 radio is saying go, you know, evacuate, and television is

1 saying no, and all the studies show that people depend upon  
2 a wide variety of sources along that line.

3               And I can recall specific studies that point to  
4 critical incidents that play an important part. I recall a  
5 study done in Colorado in which they were aware the water  
6 was coming up. They could perceive that. They had been  
7 warned for a long period of time that evacuation was  
8 possible. This had been discussed for several days, and the  
9 thing that prompted a very prompt evacuation was simply a  
10 police car coming through the suburban place and saying it  
11 is time to go, and they said okay, you know, here we go,  
12 along that line.

13               But in one sense it was not the police warning.  
14 It was a whole series of things that led up to that.

15           Q     Would you say that people make the decisions  
16 sooner and get in the car and go sooner if they can see the  
17 floodwaters rising or see the black cloud on the horizon or  
18 see it raining or feel the earthquake?

19           A     Well, that is one added factor. I do not think  
20 necessarily that would be critical in itself. You know,  
21 there are a lot of things that I cannot see, you know, go  
22 back to the germ theory of disease. That is hard to  
23 perceive. There are a lot of things in our life that are  
24 hard to perceive, and we have come around to understanding  
25 some of the phenomena. I do not think there is any one

1 critical factor involved in this. In other words, to use  
2 your example, if somebody tells me that there is a radiation  
3 leak or there has been a venting into the atmosphere, I am  
4 not really sure that I need to see that; you know, if the  
5 person is credible and knows what that is, I will take their  
6 word for it.

7           And I think that is the way that most of us, you  
8 know, most of us operate along that line. There are very  
9 few things in life that I investigate personally. I take  
10 other people's words for it, and I have not been fooled too  
11 often.

12       Q     Yes, sir. Going back to what you said about  
13 whether the information source is credible, that is a  
14 situation -- well, that is a problem that numerous people in  
15 this area feel that we have, that we do not know whether the  
16 information source is credible in our experience, of course,  
17 of the accident there set out.

18           Could you modify your previous statement as to  
19 what the situation is when the people are not sure whether  
20 or not the information source is credible?

21       A     Well, again, that is one factor. I think that no  
22 one factor is going to be a complete determinant. I think  
23 the point is if you have multiple sources of information,  
24 then -- and all the evidence that comes from everybody else  
25 is confirming, then this generally gives you an idea that

1 something has happened, even though one thing may not be  
2 credible, then you throw that out of the way. You discard  
3 that because it is inconsistent with everything else.

4 CHAIRMAN SMITH: You know what Ms. Bradford is  
5 driving at since you worked on the task force.

6 THE WITNESS: Yes, yes.

7 CHAIRMAN SMITH: Which direction are we going to  
8 go, though, on credibility? You testified earlier that the  
9 problem may be making people take the necessary actions, not  
10 acting when it is unnecessary.

11 THE WITNESS: Yes.

12 CHAIRMAN SMITH: Now, how would credibility affect  
13 that phenomenon?

14 THE WITNESS: Well, I think the best answer is  
15 multiple sources of information, and also the fact that in  
16 going back to, I think, maybe the question that we are  
17 dancing around here, the fact that also there is public and  
18 governmental information as well as company information  
19 along that line.

20 CHAIRMAN SMITH: I suggest that we might have this  
21 situation, credibility may be a factor if the advice from  
22 the government agencies and the Licensee was to do nothing,  
23 but it would not be a factor if Licensee and the  
24 Commonwealth is saying do something.

25 THE WITNESS: Do something, yes.

1 CHAIRMAN SMITH: Do you think that might be a  
2 difference there?

3 THE WITNESS: Yes. I think that is a good way to  
4 formulate it. There is some general notion that somehow in  
5 a lot of situations, not just this, that somehow there is  
6 information that we do not have that we should have, and  
7 that is where the issue of credibility comes up. But as you  
8 say, if action is suggested or ordered or whatever the term  
9 is, then the issue of credibility I think becomes somewhat  
10 less.

11 Could I add one other thing? Credibility is a  
12 very complicated concept by the way because it is not the  
13 fact -- the whole answer is not of the fact that there are  
14 certain sources credible, but another important factor is do  
15 we hear them. In other words, there are a lot of things  
16 that may be perfectly credible sources that are terribly  
17 inconvenient to hear, and for example, in reference to an  
18 evacuation, a lot of times it takes some effort to do  
19 things. And therefore, going back to my point earlier, we  
20 tend to normalize or we tend to argue with ourselves and  
21 with others, well, let's don't do it because it is not  
22 credible. We tend to talk ourselves out of taking action  
23 along that line because it is much more inconvenient. And  
24 therefore, sometimes you need in this sense extra attention  
25 to convince people to take preventive action.

1 BY MS. GAIL BRADFORD: (Resuming)

2 Q Do you feel that you would especially need extra  
3 attention in the circumstance that the information you were  
4 receiving -- well, in circumstances that you were not sure  
5 the information you were receiving is credible?

6 A Well, I think you have to deal with multiple -- if  
7 we are talking about a public -- there are two questions  
8 here, I suppose, a public information question and a  
9 question of what information you get into organizations.

10 My own theory of handling emergencies is that  
11 people need to be given as much information as possible in  
12 order to facilitate their own decisionmaking, and I think  
13 that again some of my criticism of emergency planning,  
14 sometimes people like to somehow keep information confined  
15 and channelized.

16 But I think if you are talking about public  
17 action, you have got to provide as many sources, multiple  
18 sources, many ways of information to get people to do things.

19 CHAIRMAN SMITH: It would seem to me this is  
20 consistent with the rest of your testimony in which you  
21 would not have finely detailed planning. If you are not  
22 going to have finely detailed planning, then you must have a  
23 balance of full information so that individuals can make the  
24 correct judgment.

25 (Witness nods in the affirmative.)

1 CHAIRMAN SMITH: Are they actually balancing  
2 factors?

3 THE WITNESS: Well, everybody does not need the  
4 same information. I mean, there are different types of  
5 information. For example, the types of public information  
6 that are critically important are both to provide the public  
7 an understanding of what is happening, what are the  
8 consequences, and what types of preventive action that they  
9 might be able to take.

10 There are -- so that I think sometimes public  
11 officials confuse that and imply -- well, a lot of the fear,  
12 I think, involved here is that -- is that some public  
13 officials feel that people will misuse information, and a  
14 lot of it is based upon this notion that they really cannot  
15 handle crises, which I think is a false assumption. And  
16 from anything that I know of, my argument would be to lean  
17 in the direction of public information which is as full and  
18 complete, which does not overburden people. In other words,  
19 to use a current example, I do not need -- if I were a  
20 citizen of this particular area, I do not need excessively  
21 technical details from what happened, let's say, if you had  
22 a release. I simply want to know what happened, what  
23 consequences it would have for my particular area.

24 And I think that then this is the material upon  
25 which people make decisions of what preventive action then,

1 what action can be taken. Stay inside for a period of time,  
2 or if it is serious enough, then evacuation, then what  
3 should be done in simple terms of evacuation. That is the  
4 type of information that you do not necessarily need to  
5 carry around in your head all the time.

6 In other words, I do not feel that everybody in an  
7 organization should be equally knowledgeable about the  
8 disaster plan. That is simply a burden on their mentality.  
9 What you need to do is to have certain information that is  
10 available let's say on evacuation plans in the phone book,  
11 so if you need to know it, then you can use it at that  
12 particular time.

13 BY MS. GAIL BRADFORD: (Resuming)

14 Q When the National Weather Service knows that there  
15 is a tornado coming up, how long do they broadcast -- how  
16 long in advance do they broadcast a tornado watch or tornado  
17 warning?

18 A As far as I know, when they first see it on the  
19 radar, when it first becomes apparent on the radar.

20 Q Do you know of any studies that show how long it  
21 takes people to react after the start of the watch is posted?

22 A Well, that is simply an alerting, that is simply a  
23 phase that something is around you, you know, so -- and then  
24 if you are -- in fact, as I recall, very often the  
25 instruction is that if you are driving down the street and

1 see one, call us. And so then you have a tornado alert,  
2 which means it is pretty damn close; so it is not much more  
3 precise than that.

4 Q So you do not know of any studies that show how  
5 long it takes people to react to a notification process or  
6 an alert process that has been started.

7 A Well, I do not know what you mean by "react." Let  
8 me use a personal example.

9 Q Come to a decision.

10 A Beg your pardon?

11 Q Come to a decision point.

12 A A decision to do what?

13 Q To do whatever the instruction is.

14 A The point is that that does not tell me anything  
15 about what I need to do. That simply is an indication that  
16 there is some threat around.

17 Q Well --

18 A In other words, that helps me perceive the  
19 threat. Now, the second set is if I really see one, what do  
20 I do. And obviously, in tornado time it is useful to have  
21 public information that reminds you of a couple of things  
22 you can do -- one, get in a low place, and that it used to  
23 be -- a very simple instruction is get in a highly  
24 constructed part of your house, a closet.

25 Now, those are two simple things which provide a

1 lot of help at that particular time, but I do not need to  
2 know that particularly until I see one coming down the  
3 road. I mean, if it is 5,000 -- you know, 150 miles away,  
4 that is just sort of interesting.

5 Q Not limiting the question to just tornadoes, do  
6 you know of any study that tells how long it takes for  
7 people between the time that they receive an alert or a  
8 notification and the time that they personally come to a  
9 decision when they start to act on whatever they are going  
10 to do?

11 A I cannot answer it in that way simply because  
12 there are multiple things involved. One issue is the  
13 question, what is your belief in the warning system that you  
14 have got, and if you are listening to the radio, that is one  
15 particular clue.

16 A second part of that is if you believe the  
17 warning is the assessment of essentially what is the  
18 personal risk to me, in other words, if I believe the  
19 warning and I am out of the alert area, like I say, that  
20 does not worry me. I am over there. That is their problem,  
21 although I would be -- tornadoes are kind of tricky. They  
22 turn on you.

23 Once you have made an assessment of essentially  
24 that the threat exists and there is personal risk to you,  
25 then you go on to the next step, what should I do.

1           Q     How long does that assessment process take?

2           A     It depends on the preceding two. There is no  
3     automatic way. In other words, you are always processing  
4     information. Our tornado example, I may know that, you  
5     know, eight hours before that there are tornadoes in the  
6     area or the other conditions are right, and I walk around  
7     all day with that knowledge. And then somebody spots one,  
8     and I hear it, and say okay; you know, I am going to be much  
9     more alert to this particular situation. And if I know  
10    where they are, if it is in my area, you know, I am going to  
11    begin to monitor the weather myself. And that has its  
12    dangers, too.

13               I knew some people who went out on their front  
14    porch and got blown off by the thing. Then the question is  
15    what do you do knowing the high probability that I am in an  
16    area in which there is -- I have a high probability of being  
17    hit by a tornado. I might head to a closet with a bottle of  
18    scotch and wait it out. That is a nice, painless  
19    preventive type of action, and in many cases these are  
20    institutionalized, and in many areas with repetitive  
21    disasters. Hurricane parties are great.

22           Q     So you -- getting back to my question, do you know  
23    of any studies that you can count on to accurately predict  
24    how long a given population will take between the time the  
25    sirens start and the time they get in their cars, if that is

1 what they are supposed to do?

2 CHAIRMAN SMITH: Ms. Bradford, I do think that  
3 your question is too general. Dr. Dynes has explained the  
4 difficulty of answering it. I think you are going to have  
5 to narrow it before you get any --

6 Can you answer the question?

7 THE WITNESS: Let me -- obviously in an area like  
8 this that has an incident before, when a siren goes off,  
9 that is a good clue that you should pay attention, right.  
10 And so you begin to seek other types of information. So I  
11 suppose in one sense it would be -- the process here would  
12 be speeded up more than in other communities where they do  
13 not have the experience either with the incidents, or you do  
14 not have the series of sirens.

15 A siren is essentially a clue that you had better  
16 start monitoring the environment and getting other types or  
17 sources of information. And I think that -- I would expect  
18 that people would pay much more attention to sirens in this  
19 area than they would in, I do not know, Columbus, Ohio.

20

21

22

23

24

25

1 CHAIRMAN SMITH: Was that your question?

2 MS. GAIL BRADFORD: Not exactly. Let me try it a  
3 different way.

4 BY MS. GAIL BRADFORD: (Resuming)

5 Q Do you know of any studies that were done on this  
6 area about the accident two years ago at Three Mile Island  
7 that studied or described how long a time it took people to  
8 make assessments of what the situation was and what their  
9 families and they should personally do?

10 A I think in part I answered it. Obviously, when  
11 the first news stories got out, that was when people were  
12 alerted. And some of them moved out fairly quickly. I  
13 think if you look at the distribution of evacuation, it is  
14 almost a bell-shaped, traditional bell-shaped curve; that  
15 the bulk of the people moved out on Friday, some moved out  
16 earlier, some moved out later.

17 So it is what would be called a normal  
18 distribution.

19 Q Do you know of any studies on the particular  
20 people who were instructed to leave, starting from the time  
21 that they were instructed to leave, to how long it took the  
22 first group, the main bulk of the bell shape, and the last  
23 group to leave?

24 A I do not know what you mean by "instructed." This  
25 implies that people waited around to be instructed. What I

1 am saying is that people are making decisions all the time.

2 Some made them early, some made them late.

3 Q Yes, sir. There was a time when Governor

4 Thornburgh actually made an announcement.

5 A That is right.

6 Q From that time.

7 A But that is -- I am not sure what that means,

8 except, you know, that is only one event in a continual

9 process.

10 CHAIRMAN SMITH: What were the times involved in  
11 the bell-shaped curve to which you refer?

12 THE WITNESS: I think the Friday night was the  
13 peak, the peak movement. But I do not know whether that was  
14 caused by Governor Thornburgh's announcement or caused  
15 because it was Friday night.

16 CHAIRMAN SMITH: So the bell-shaped curve is not  
17 based upon a zero time. It is just when things happened.

18 THE WITNESS: No. Essentially, I think there were  
19 some people who evacuated with the first incident, very  
20 small number. In other words, if you went up through -- I  
21 have lost the time frame on this. If you went through --  
22 there were some people with the first incident probably  
23 left, a small number; an increasing number as you moved into  
24 Friday and Friday night was the peak.

25 Some moved out on Saturday, some moved out on

1 Sunday.

2 CHAIRMAN SMITH: The trouble is, Ms. Bradford has  
3 been questioning you now for a long time on what can you  
4 tell her about the time factors that are involved when  
5 information necessary to take an action is received and the  
6 time the decision is made to take action? Can you be of any  
7 more help to her?

8 THE WITNESS: No, I cannot, because the  
9 implication is that there was some magic number that has  
10 elapsed, which is simply not true. And in an evacuation  
11 people do not wait on official information to take action.  
12 They are not waiting on the Governor to say things. They  
13 are making assessments themselves.

14 The Governor might have a type of information that  
15 is important to them and might prompt them. But what you  
16 have is essentially people making decisions, family units  
17 making decisions on whether they take preventative action.  
18 And I am not -- I am not sure that the time frame is really  
19 too relevant here. They do it in the time frame they have  
20 available.

21 CHAIRMAN SMITH: Ms. Bradford, we are not being  
22 very efficient or productive here. If you have particular  
23 information in mind, why don't you suggest it to Dr. Dynes  
24 and then let him comment on it. But otherwise, we are  
25 spending an awful lot of time and we are not getting any

1 information which I think answers your question.

2 I do not think we have any more information now  
3 than when you first began along this line on trying to  
4 establish some times.

5 MR. CUNNINGHAM: Mr. Smith, in order to be  
6 relevant, in the evacuation time estimates prepared by  
7 Parsons, Bringerhoff, Quade and Douglas, the chart  
8 specifically provides for a 20-minute preparation time from  
9 the time of warning to the time of departure. And what we  
10 are trying to -- the first question to Dr. Dynes is, did he  
11 aid in the preparation or did he consult with Parsons,  
12 Bringerhoff, Quade and Douglas in their preparation of this  
13 report.

14 THE WITNESS: The answer is no.

15 CHAIRMAN SMITH: Okay. No.

16 BY MR. CUNNINGHAM: (Resuming)

17 Q Does he have an opinion, in the evacuation time  
18 estimates, a 20-minute estimation of time from the point of  
19 hearing a warning siren to the point of departure; is that a  
20 reasonable estimate in your opinion?

21 A Sure.

22 Q Okay. On what do you base your opinion?

23 A On the fact that if you get a strong message that  
24 there is a threat involved, a very rational response is to  
25 get the hell out of there and to get out of there as quickly

1 as possible, not to look at your watch.

2 Q But also, wouldn't you have to admit that you  
3 would go through the same decisionmaking process, the  
4 tripartite decisionmaking process?

5 A Sure.

6 Q First you make a --

7 A That can be done in one minute.

8 Q And it can be as long as three hours.

9 A Sure.

10 MR. CUNNINGHAM: I have no further questions.

11 BY MS. GAIL BRADFORD: (Resuming)

12 Q In this example of the 20-minutes cited, do you  
13 feel that the situation we are talking about, where there  
14 would be a siren -- and we are assuming in this question  
15 ample siren coverage -- and a radio instruction to do  
16 something or other, that that 20-minute period -- to take an  
17 action, how does that 20 minutes relate to a comparable  
18 period two years ago at the time of the TMI accident, in  
19 which there was a definite time when the Governor of  
20 Pennsylvania said, leave, to the people in the five miles,  
21 and there was a bell curve, as you say, of the time -- of  
22 course, some people started leaving before Governor  
23 Thornburgh said to, but --

24 A I cannot answer that because it is essentially --  
25 you are introducing a new element that was not present last

1 time, which was the sirens.

2 MR. ZAHLER: Mr. Chairman, so there is no  
3 confusion here, the 20 minutes in the time evacuation study  
4 is not from siren-sounding to leaving. It assumes the siren  
5 has already been sounded, and it also assumes then that  
6 there has been an announcement that a decision has been made  
7 that it is recommended that people evacuate. And the 20  
8 minutes is from that public announcement to evacuate prior  
9 to the time that people begin to travel.

10 It is not from the sirens. I think those terms  
11 may have been used loosely back and forth between both the  
12 questioner and the answerer. And if Ms. Bradford wants to  
13 compare it later to the Parsons, Bringerhoff study, it  
14 should be clear what 20-minute period we are talking about.

15 CHAIRMAN SMITH: Do you agree?

16 MR. CUNNINGHAM: Yes.

17 BY MR. CUNNINGHAM: (Resuming)

18 Q My question to Dr. Dynes is, with Mr. Zahler's  
19 qualifications and explanation of what the estimate really  
20 represents, from the time of an announcement of an  
21 evacuation, I assume your testimony would be the same; is  
22 that correct, Dr. Dynes?

23 A Would be what?

24 Q Would be the same?

25 A Yes. In other words, this -- his point here is

1 that obviously the notion of threat had been knowledgeable  
2 -- people had been aware about it before that time. So in  
3 that way, they had a long time to prepare and take the  
4 action which they were going to take.

5 Q Your response to my follow-up question would be  
6 the same? It could be as little as three minutes or as long  
7 as three hours?

8 A Sure.

9 (Pause.)

10 CHAIRMAN SMITH: Are you actually working from a  
11 cross-examination plan?

12 MS. GAIL BRADFORD: Sir, I am developing it. I am  
13 trying to make notes as he gives these rather long answers,  
14 and then I am checking back to see whether I followed up on  
15 the notes I have made.

16 CHAIRMAN SMITH: All right.

17 (Counsel for ANGRY conferring.)

18 DR. LITTLE: Dr. Dynes, in the interim would you  
19 comment on the probabilities of evacuating a ten-mile EPZ  
20 within 15 minutes of a siren warning, based either on your  
21 familiarity with this area or general expertise or any  
22 studies that you have done?

23 THE WITNESS: Well, I have some vague  
24 recollections from the past. You are talking in terms  
25 specifically of this particular incident here?

1 DR. LITTLE: You can qualify your answer one way  
2 or the other.

3 THE WITNESS: You say from siren time, from the  
4 time of siren. Would that be the first indication that  
5 people would have had that something was wrong?

6 DR. LITTLE: It could be.

7 THE WITNESS: Yes. Certainly it could be  
8 initiated in that time in the area of listening. It is the  
9 same way of any type of alarm system in the school. You  
10 hear it and you start to take action along that line. And I  
11 cannot translate in my own mind. Certainly you could cover  
12 ten miles, even if you were at the center, in 15 minutes.

13 DR. LITTLE: This involves the decision time and  
14 getting things together and getting out.

15 THE WITNESS: Well, I am not -- if you are really  
16 giving me a strong clue, I am not sure what you want to take  
17 along. That would be more important in getting out. I  
18 mean, it is a similar problem that you have in a burning  
19 building. You can do an inventory of your strongbox. But  
20 if you are really in a critical situation, you get out.

21 MR. GRAY: Dr. Little, I am not sure that Dr.  
22 Dynes understood your question. I am not sure I did,  
23 either. But was your question the probability that within  
24 15 minutes of the siren being activated there would be  
25 evacuation of the ten-mile EPZ? By that do you mean all the

1 people in the ten-mile EPZ?

2 DR. LITTLE: Notification and mobilization.

3 MR. GRAY: So the start of an evacuation. I see.

4 MR. ZAHLER: Do you understand? The question is  
5 initiation of movement, not actually clearing the whole  
6 area.

7 DR. LITTLE: Not finished, right.

8 THE WITNESS: Yes. Yes, I have no problem on  
9 that. If you hear the siren, you have to get out.

10 Again, there would be a confirming experience.  
11 But obviously part of that confirming experience would be  
12 the fact of seeing others get out, which suggests that  
13 something is wrong, and then you would move in that  
14 direction too.

15 I think it would have to be more than simply the  
16 siren. The siren is a clue, one clue, that would be added  
17 to other types of things. But that is a fairly strong  
18 reminder.

19 (Board conferring.)

20 DR. LITTLE: Go ahead. We might pursue this a  
21 little later.

22 BY MS. GAIL BRADFORD: (Resuming)

23 Q I just have one more question, because I am not  
24 sure whether I got a yes or no answer to this. It is my  
25 understanding that you have not evaluated the five risk

1 county plans against your eight principles set forth in your  
2 comments; is that correct?

3 A No. I derived those principles before the plans  
4 came out --

5 Q I cannot hear you.

6 A Those are my principles, which I derived a long  
7 time ago. I did not compare them to current plans, no.

8 MS. GAIL BRADFORD: Thank you.

9 (Pause.)

10 CHAIRMAN SMITH: Okay. You may proceed.

11 BY MS. STRAUBE:

12 Q Dr. Dynes, the task force on emergency response  
13 that you were chair of -- is that right, you were chair of  
14 it? Did it make recommendations? Are those recommendations  
15 contained in the Kemeny report?

16 A Yes.

17 Q Yes. Was part of the recommendations the  
18 importance of the adequacy of county and local plans?

19 A Yes.

20 Q Okay.

21 CHAIRMAN SMITH: I did not hear that question.

22 THE WITNESS: The question was, was part of the  
23 recommendation the adequacy of county and local plans,  
24 right?

25 BY MS. STRAUBE: (Resuming)

1 Q The importance of the adequacy.

2 A Improving local planning, that was one of the  
3 recommendations, right.

4 CHAIRMAN SMITH: Thank you.

5 BY MS. STRAUBE: (Resuming)

6 Q Was your work on the task force on emergency  
7 response the only emergency planning experience that you  
8 have had related specifically to nuclear facilities?

9 A Yes. I am not -- if you are asking me whether it  
10 is my business to draw up emergency plans, the answer is  
11 no.

12 CHAIRMAN SMITH: No, I do not think that that was  
13 the question. Was it?

14 MS. STRAUBE: The answer to that question was  
15 fine, too. But I can repeat the first one.

16 BY MS. STRAUBE: (Resuming)

17 Q Was your work on the task force on emergency  
18 response the emergency planning experience that you have had  
19 related specifically to nuclear facilities?

20 A Well --

21 Q Okay. I think I understand.

22 A The point --

23 Q The emergency planning experience, you have had  
24 none; is that the problem?

25 A I looked at a variety of situations over the years

1 in which I have examined a large number of emergency plans  
2 in a wide variety of situations. If you are asking me  
3 whether -- whether it is my job to draw up emergency plans,  
4 the answer is no.

5 Q Have you, other than your work with the task force  
6 on TMI-2, have you had any other experience specifically  
7 related to nuclear facilities?

8 A I have looked over various things at various times  
9 in my experience, yes.

10 Q Which related specifically to nuclear facilities?

11 A Yes.

12 CHAIRMAN SMITH: Would you wait a moment. Just a  
13 moment, please.

14 DR. LITTLE: I believe Dr. Dynes' mentioned earlier  
15 that he had looked at some nuclear facilities other than  
16 commercial power generating.

17 THE WITNESS: Yes. For example, to maybe clarify  
18 your point, one thing that I have done for a number of years  
19 is to lecture to local civil defense officials. And  
20 depending upon the region, for example, a district -- it  
21 used to be District 10, which was a northwest district.  
22 Nuclear plants was a concern of theirs in the context of  
23 emergency planning.

24 And I think that, going back to my point, is that  
25 nuclear -- planning for emergencies in nuclear situations is

1 very similar to any other type of emergency planning. And  
2 one of the unfortunate parts, if I can digress, in American  
3 history is that it was pulled out of that. That is part of  
4 the problem.

5 And my feeling is emergency planning is emergency  
6 planning is emergency planning.

7 MR. ZAHLER: Dr. Dynes, part of the confusion  
8 would be, when the counsel for the Commonwealth used  
9 "experience in emergency planning," I do not believe she was  
10 referring necessarily to just actually drafting plans, but  
11 as part of your general professional experience, either  
12 reviewing them, commenting on them, talking about them.

13 THE WITNESS: I have written a monograph that  
14 refers to how cities, how 12 metropolitan areas in the  
15 United States handle planning, which involves looking at the  
16 whole process historically over the last 50 years. Then  
17 these are 12 major metropolitan areas.

18 BY MS. STRAUBE: (Resuming)

19 Q Are you familiar with NUREG-0654?

20 A I have glanced at it, yes.

21 Q Do you mean that exactly as you said it, that you  
22 have glanced at it?

23 A Well, yes. And again, you know, I have a lot of  
24 things to read, and that type of format is not --

25 Q Did you play any role in developing that guide?

1       A     Not that I know of. I think there are some  
2 suggestions I would say that came out of the Kemeny  
3 Commission. I recognize a few things that looked vaguely  
4 familiar. I would suspect so, but I do not have direct  
5 knowledge.

6       Q     But you did not personally submit comments on  
7 NUREG-0654; is that correct?

8       A     No. I assume that the people who produced that  
9 read the President's Commission's report.

10      Q     Are you familiar with the NRC's emergency planning  
11 rule?

12      A     Emergency planning rules, again, I have read  
13 earlier versions of them as such.

14      Q     Okay. Did you play any role in developing that  
15 regulation?

16      A     No. Again, I assume people in there have read  
17 things that I have written.

18      Q     When were you hired by Metropolitan Edison for the  
19 purposes of this proceeding?

20      A     I am really not sure I am hired. I told them that  
21 I would, some time last summer, I believe. We had a  
22 conversation. I cannot remember the exact date. We had a  
23 brief conversation. They asked me whether I would -- might  
24 be interested, and I said I would. And this was picked back  
25 up again, I guess, a month or so ago. I have forgotten the

exact sequence.

Q Was that for purposes of testifying, that they asked you?

A Counsel asked me -- we talked in general terms about the nature of the testimony. I prepared a document and gave it to him.

Q Were you consulted by Licensee prior to their developing their own emergency response plan?

A I did at one time go through the plant plan at Three Mile Island.

Q Is that for Unit 1?

A That was simply in the context, I think, after a drill, simply to go over certain things at that point. I gave certain suggestions at that time. As I recall, those were relatively minor in nature. In other words, basic planning had been done.

Q Do you know whether your suggestions were followed?

CHAIRMAN SMITH: Before you go too far, you said the plant plan?

THE WITNESS: Plant.

CHAIRMAN SMITH: Plant. You mean the onsite?

THE WITNESS: Onsite.

BY MS. STRAUBE: (Resuming)

Q Okay. When did you review the Commonwealth's

1 emergency plan?

2 A When did I review it?

3 Q Yes.

4 A In reference to the Kemeny Commission?

5 Q No, in reference to TMI-1 restart.

6 A No, I have not. I ran through it quickly I guess  
7 about a year ago, a year ago. Not that long ago; last  
8 summer some time.

9 Q Last summer some time? That would be in 1980?

10 A Yes.

11 Q Okay. And is the testimony that you have  
12 presented, your direct testimony, based at all on that  
13 review of the Commonwealth's plan?

14 A Based what?

15 Q Based on your review of the Commonwealth's plan?

16 MR. ZAHLER: You have to answer. You cannot just  
17 shake your head.

18 THE WITNESS: No. Okay, thank you.

19 BY MS. STRAUBE: (Resuming)

20 Q And I believe -- not to be too repetitious, but I  
21 believe you stated before that you had not reviewed the five  
22 county plans; is that correct?

23 A That is correct.

24 Q Do you know in what respects the Licensee's  
25 emergency response plan differs from the criteria in

1 NUREG-0654?

2 A No. Again, that is not my job. The answer is no.

3 S. STRAUBE: I have no further questions.

4 (Pause.)

5 CHAIRMAN SMITH: Let's take the afternoon break,  
6 15 minutes.

7 (Recess.)

8 CHAIRMAN SMITH: Are we ready?

9 BOARD EXAMINATION

10 BY CHAIRMAN SMITH:

11 Q Dr. Dynes, how long have you been at the American  
12 Sociological Association?

13 A 1977 I came there.

14 Q I infer from, I guess, the title of American  
15 Sociological Association and the fact that you have not had  
16 occasion to read NUREG-0654, which is also FEMA-1, that you  
17 are no longer a specialist in disaster studies.

18 A Well, my job is I essentially run a scholarly  
19 professional organization as a staff member. We have 14,000  
20 members in 70 countries. And what I can do, I do like the  
21 Kemeny Commission, on vacations and part-time. I try to  
22 keep my hand in, but I am limited.

23 I am no longer actively involved in research. I  
24 occasionally consult with FEMA or other agencies and so  
25 forth. But I try to keep up on the literature. But I am

1 not an active researcher now.

2 Q In the disaster area?

3 A Right.

4 Q The last few years, except for your special  
5 assignments, you have been a generalist and not a  
6 specialist.

7 A Yes, that is right.

8 Q If you had still been back at Ohio State, I would  
9 guess that you would be quite familiar with the FEMA and NRC  
10 --

11 A Yes. Being in Washington, also, I try to keep up  
12 with certain things in FEMA. Again, that is a full-time job  
13 rather than -- I mean, that would take a full-time job as  
14 such.

15 Q I also infer that you were retained by the  
16 Licensee in the event that psychological stress became an  
17 issue in the case. Was that one of the understandings of  
18 your employment?

19 A Not -- not really. I think at an earlier time  
20 there was some discussion. We had some discussion of that.  
21 But I -- my own time and energy are probably better spent in  
22 terms of looking at emergency planning.

23 CHAIRMAN SMITH: Mr. Zahler, I might state that  
24 the Board thought it was somewhat inconsistent for you to  
25 represent to the Board that Dr. Dynes has testimony which is

1 valuable in the emergency planning area, and yet he was not  
2 employed by you to evaluate the emergency plan. We did feel  
3 that that was somewhat inconsistent.

4 Now we recognize the limitations that he puts on  
5 his testimony and -- but we thought we would let you know  
6 what our reaction was there.

7 MR. ZAHLER: Let me just state that when we looked  
8 at the project of how many hours and the time that would be  
9 necessary to evaluate the plans, it was beyond what Dr.  
10 Dynes had available to assist us. To actually do it might  
11 take hundreds of man-hours.

12 The other problem, I will tell you, I gave Dr.  
13 Dynes two iterations of the state and county plans and the  
14 plans kept changing. It is not a thing to get a handle  
15 on.

16 We would have much preferred, had it been possible  
17 in fact, to provide an expert who would have reviewed those  
18 plans. I might state for the Commission that is likely to  
19 be a problem in a lot of licensing proceedings, as to  
20 Licensee's input with respect to offsite planning. And it  
21 is not an easy one to solve.

22 CHAIRMAN SMITH: In any event, Dr. Dynes has  
23 clearly limited the intended scope of his testimony and I  
24 have no criticism at all on that score. Okay.

25 BY DR. LITTLE:

1           Q     I have a copy of the emergency planning rule, the  
2 final regulations, and I wanted to read a statement. This  
3 is going back to what I mentioned before. It says:

4                 "By July 1, 1981, the nuclear power reactor  
5 Licensee shall demonstrate that administrative and physical  
6 means have been established for alerting and providing  
7 prompt instructions to the public within the plume exposure  
8 pathway EPZ."

9                 And then it goes on down, it should be within 15  
10 minutes. This would be notifying the public and alerting  
11 them with the instructions, the key instructions within a  
12 15-minute period, so that mobilization could start within 15  
13 minutes after the siren.

14                 Is that -- do you consider that possible? In  
15 other words, the public would have the information needed,  
16 the majority of the public would have the information needed  
17 by 15 minutes.

18                 A     In the planning zone?

19                 Q     Ten miles.

20                 A     I think it's possible, yes.

21                 (Boards conferring.)

22                 CHAIRMAN SMITH: I think that perhaps there is a  
23 basis for some confusion in the cross-examination and Dr.  
24 Little's question. We have had two time periods referred  
25 to, the time period. The 15-minute time period is the time

1 where the information -- it was the -- when the emergency  
2 action level is determined, from the time that the emergency  
3 action level is determined to the time that the warning is  
4 made.

5 All right, what is the 15 minutes from the rule?

6 MR. ZAHLER: Mr. Smith, there are two 15-minute  
7 periods. The first is that from the time that an emergency  
8 action level is triggered in the plant the Licensee has 15  
9 minutes to make a notification to offsite authorities.

10 CHAIRMAN SMITH: All right. That is right.

11 MR. ZAHLER: Then once -- now, offsite authorities  
12 have an unlimited amount of time to make whatever decision  
13 they desire with respect to protective actions, or even  
14 pushing the button for the siren system.

15 Once they make a decision that it is appropriate  
16 to alert the public within the plume exposure pathway EPZ,  
17 they have to carry out that alerting function, and that is  
18 typically referred to as the siren system. One does not  
19 need a siren system if you have --

20 CHAIRMAN SMITH: Okay. I understand. You are  
21 going into more than we need. That was covered very  
22 thoroughly. I am embarrassed that I have forgotten that.  
23 All right.

24 Now, I just wanted to clarify. The  
25 cross-examination covered the period of time from

1 notification to the beginning of taking action.

2 BY CHAIRMAN SMITH: (Resuming)

3 Q Now, what did you understand to be meant by Dr.  
4 Little's question?

5 A The notification from the siren, could that area  
6 be cleared? An action, I think -- a siren, if we use the  
7 example here -- a siren essentially would give a clear clue  
8 that something is wrong. Other sources of information would  
9 be sought out to confirm it, and that could be done in a  
10 very short period of time.

11 If the radio has that and then, during the process  
12 of confirming, people would be beginning to move out.

13 BY DR. LITTLE: (Resuming)

14 Q That is correct, now, that the siren will not  
15 automatically mean mean there is something wrong at TMI? As I  
16 understand from the newspaper accounts, it is simply an  
17 alert for someone to seek information because there is some  
18 emergency, not necessarily a nuclear emergency.

19 MR. ZAHLER: That is correct. It is the  
20 indication to turn on your radio or TV to the emergency  
21 broadcast system and to seek out the other confirming  
22 information, to use Dr. Dynes' term.

23 THE WITNESS: The problem -- and this goes way  
24 back in emergency planning, it goes way back to the early  
25 50's -- is that there was the assumption that was often made

1 in some of the earlier planning that the sirens meant  
2 something, would convey something, would convey particular  
3 types of actions, it would automatically do that.

4           And on the basis of research that was done there,  
5 it seemed very clear that when people hear a siren it  
6 implies that something is wrong and therefore it is a clue  
7 for them to seek out other types of information, which then  
8 can supplement what types of preventative action they can  
9 take.

10           (Board conferring.)

11           BY DR. LITTLE: (Resuming)

12           Q     Going back to some of the other questions I had  
13 wanted to ask you, first of all, I know you have published  
14 some papers on the state of the art for predicting what  
15 people are going to do during disasters, and my first  
16 question is, what degree of confidence do you have that the  
17 public reaction can be predicted with the information you  
18 have available?

19           What is the state of the art of predictive --

20           A     The state of the art is essentially the research  
21 base on the reaction of people to emergencies in a wide  
22 variety of situations over the last 60 or 70 years, and the  
23 knowledge that people are -- have not changed over that  
24 period of time, a great consistency among their reactions to  
25 a wide variety of agents.

1           Q     So you have a high degree of confidence in that  
2 the reactions of people in a disaster can be predicted?

3           A     Yes.

4           Q     Can you comment on the difference in response by  
5 the public to natural disasters versus so-called manmade  
6 disasters?

7           A     Well, I think I can go back to the point that I  
8 made earlier. That is one distinction that one can make.  
9 It is really a distinction on the basis of what the cause of  
10 the threat is. In other words, one is -- comes from some  
11 natural event.

12                 But I am not sure that is the best type of  
13 distinction. In other words, certain types of natural  
14 events are very similar to manmade events. The fact that  
15 some of them are very sudden, do not give you very much  
16 warning, and therefore one has to look at those criteria as  
17 the basis for comparison.

18                 In other words, an earthquake may be more like --  
19 which is, quote, a "natural event," -- as an explosion,  
20 because both of them do not give you types of warning. Then  
21 the question comes, what is the reaction in a situation in  
22 which you have an agent which does not give you warning.

23           Q     Well, what about -- does this at all impact on the  
24 perception of the public as to who might be responsible for  
25 emergency planning?

1       A     Okay, all right. Now, that is, I think, a very  
2 valid point, that there is -- if you get to the question of  
3 blame and responsibility, probably that distinction is a  
4 meaningful one, because we have ways of essentially looking  
5 at, quote, "acts of God," which suggests that they go beyond  
6 human responsibility. I do not know if that is a good legal  
7 distinction or not, but it is a psychological distinction  
8 that people make.

9              So that there is a difference, if you will, in the  
10 placement of the blame along that line, and that distinction  
11 would hold and would be a meaningful one in that.

12       Q     The implications in the perception of the public  
13 as to where the responsibility lies for emergency planning?

14       A     Let me phrase it in this way or answer it in this  
15 way. I think one of the things that is happening in  
16 American society -- and it is more general than that -- is  
17 that we have -- we have given a great deal more attention  
18 and thought to essentially natural disasters in the past,  
19 and now we are becoming conscious of the fact that there are  
20 a wide variety of other types of agents of different origins  
21 that are similar in their effect and similar in their  
22 consequences, and perhaps much more important.

23              For example, the death rate for natural disasters  
24 has actually declined, the best data that we have over a  
25 period of time, and we have made some impact along that

1 line. But on the other hand, we have tended to ignore  
2 essentially new types of agents.

3 And the best example that I can give is the fact  
4 that for a long time we have tended to ignore chemical and  
5 toxic agents in the United States. So that -- so that  
6 communities that are on major highways, interstate highways,  
7 are much more likely to be impacted by a truck that has a  
8 chemical that nobody knows how to handle than they are from  
9 the routine flood that they get used to.

10 So I think that the point I am trying to make is,  
11 gradually we are becoming more conscious of the  
12 technological agents and crises that can affect us, and  
13 beginning to turn and look at these in the same context of  
14 emergency planning: blackouts, toxics, nuclear, the whole  
15 range of these.

16 But we are building them on essentially the same  
17 concept of emergency planning that comes out of natural  
18 disasters.

19 Q You mentioned earlier you thought it was an  
20 artificial distinction to take nuclear occurrences outside  
21 of emergency planning in general.

22 A Yes.

23 Q Do you think -- do you think that the public has  
24 the attitude that nuclear accidents are in a different  
25 category and it affects their interest in developing

1 response plans?

2        A    I think there is a tendency to see them somewhat  
3 apart. But what I was referring to, earlier in the history  
4 of emergency planning is that there has always been a  
5 tendency to treat emergency planning in terms of specific  
6 agents. In other words, in the history -- in the ancient  
7 history, I guess, of FEMA they used to have the Defense  
8 Civil Preparedness Agency or the Office of Civil Defense,  
9 which looked at one type of threat. You look at other  
10 agencies that had concerns for other types of threats.

11           And then you had, oh, AEC and NRC, which was  
12 concerned with nuclear. And the problem was that you had  
13 agencies with different responsibilities. Now, one of the  
14 arguments for the consolidation, at least at the federal  
15 level, of FEMA and also at the state level was to say, look,  
16 instead of emphasizing these differences, let's look at the  
17 similarities.

18           And I think that one of the consequences, and  
19 specifically in this state, was the development of the  
20 Emergency Management Agency, which says in effect that we  
21 need to look at -- we need to look at a variety of agencies,  
22 a variety of threats in terms of the same types of actions  
23 and the same types of concerned agencies.

24

25

1 Q Would you comment on whether or not the public  
2 perception of the sensitivity of the Licensee to community  
3 fears has any factor in emergency planning?

4 A The?

5 Q The public's perception of whether or not the  
6 Licensee is sensitive to community fears, has any effect on  
7 their ability to plan effectively for emergencies.

8 A Well, I think this is a general problem that  
9 probably cuts through a lot of the technological ones.

10 Q Yes, manmade.

11 A Where you have some suspicion of the operator, you  
12 also, of course, have some suspicion of governmental  
13 action. This is an attitude that tends to cut through. It  
14 is essentially one of perception of size. They are not  
15 quite sure what is going on in there. It may be more a  
16 function of size than the sector in which you operate. In  
17 other words, there is a distrust, but I do not know whether  
18 -- I am not sure that that is a -- I am not sure that that  
19 is easily -- one could easily change that.

20 Q Do you think this would have any effect, say, if  
21 the order was given or the instructions were given that a  
22 ten-mile evacuation was warranted, that people might in fact  
23 go 20 miles, or people would evacuate up to 20 miles?

24 A No. I think there would be -- the general  
25 tendency is somewhat to discount and not to go further, but

1 to go less.

2 Q Do you think that this population has been  
3 conditioned differently in that sense?

4 A Well, I do not know. The only thing we could do  
5 would be to test it again, if you will. But I think -- I am  
6 not sure. I think there is a greater sensitivity.

7 If you look at areas where you have repetitive  
8 events, there is a greater degree of sensitivity and  
9 knowledge of preventative action, which is a positive  
10 outcome. And I think that what I was trying to illustrate  
11 is it is difficult to get exactly comparative data.

12 Q I believe there have been studies, not of nuclear  
13 incidents, but other types of disasters, in which the  
14 disaster hits the same community in fairly short  
15 succession. I do not recall the details. But could you  
16 comment on the evacuation on the second go-round?

17 A Well, generally people learn from one experience  
18 to the next. In other words, the difficulty, as I think I  
19 explained, in some instances, occasionally you can learn bad  
20 habits.

21 You can assume that the same thing is going to  
22 happen and it may be a little bit different. But I think in  
23 general communities that have repetitive threats generally  
24 have both better emergency planning and better  
25 implementation of plans.

1        Q     You have commented in your testimony on the  
2 relationship between the public education program to the  
3 effectiveness of any emergency planning. Have you had any  
4 opportunity to look at some of the brochures which are being  
5 prepared for education of the public in this area in regard  
6 to nuclear incidents?

7        A     I saw an earlier version, I guess. I am sure  
8 there are other things past that particular point.

9        Q     I do not know what time you saw it, so I cannot  
10 comment on whether or not you saw the latest version. Mr.  
11 Zahler might be able to help me.

12              MR. ZAHLER: My guess is -- what I am thinking of  
13 -- and Dr. Dynes can correct me -- is the meeting we had in  
14 the summer, where we talked about the public education. But  
15 that was at a very, very early stage, and I cannot recall  
16 exactly what the pamphlet was that Dr. Dynes may have  
17 reviewed.

18              Licensee has not asked Dr. Dynes to review the  
19 public education program. Whatever he saw in the summer was  
20 more in the way of background and context for what was going  
21 on in general. I would not rely on Dr. Dynes' having  
22 reviewed any of that material.

23              MS. GAIL BRADFORD: I have a copy here of an old  
24 pamphlet that they are proposing to redistribute. Could we  
25 just check to see whether this is the one he has seen?

1           THE WITNESS: Is that the one that came out of  
2 health physics?

3           MR. ZAHLER: If he recalls --

4           (Counsel handing document to witness.)

5           (Witness reviewing document.)

6           THE WITNESS: I think so, yes.

7           MS. GAIL BRADFORD: Sir, could you pass that to  
8 Mr. Zahler or to the Board, so we can get some  
9 identification of whether that is the same pamphlet we were  
10 talking about earlier when Mr. Giangi and --

11          THE WITNESS: I think I have seen a version of  
12 this. This is essentially on emergency information that was  
13 published by PEMA. I do not know how it has been  
14 distributed.

15          CHAIRMAN SMITH: That is the same?

16          MR. ZAHLER: It is the same.

17          BY DR. LITTLE: (Resuming)

18          Q       I was going to ask you to comment on whether you  
19 thought the level and degree of information given was  
20 appropriate for the population in the area, whether it is  
21 too simplistic, too complicated, or what?

22          A       Well, I would -- I think my general answer to that  
23 would be that one has to do a variety of different types of  
24 formats. I would certainly not depend upon one pamphlet.  
25 And in fact, I think in certain instances it might provide

1 more than one wants to know. But that might have some  
2 advantages in terms of familiarizing people with certain  
3 background items.

4 I think in the public education thing you have to  
5 depend upon a variety of types of forms and different types  
6 of information to different types of targets. And as I  
7 understand this, this is more or less sort of background  
8 information, which is different between other types of  
9 information in which you are asking people to take specific  
10 types of actions.

11 Q Could you comment, based on your experience with  
12 any type of disaster, about appropriate dissemination  
13 methods for emergency planning information, appropriate  
14 methods of dissemination to the public?

15 A Essentially, you use all the media that you can  
16 and I think use the media that people listen to. We know by  
17 and large that radio and television are extremely good  
18 mechanisms of communication. Newspapers are, too.  
19 Pamphlets, phone books, a whole variety of types of things  
20 might be utilized.

21 So I think that in general what you have to do is  
22 essentially use the media in the way -- in the way that  
23 people use it in the local community.

24 Q There has been raised a number of times the issue  
25 of certain groups of population in this area which do not

1 generally have radios, telephones, et cetera.

2 A Well, yes, I have heard that, along that line. And  
3 the only judgment that I can make is I think sometimes we  
4 probably overestimate the isolation of various people from  
5 the world. even old order Amish.

6 Q Could you comment -- I think you have, you have at  
7 least alluded to this, but I would like another statement of  
8 your opinion about the public's perception of the  
9 effectiveness of emergency plans and their likelihood of  
10 taking the recommendations and going through the plans as  
11 they have been drawn up?

12 A Well, there is, I think, a twofold answer to  
13 that. I think that people see public emergency planning as  
14 essentially ways of facilitating information to them or ways  
15 of helping them. I think, in addition to that, that  
16 families are going through their own, and individuals are  
17 going through their own, mental rehearsals as to planning.

18 And in other words, emergency planning is not just  
19 something that the county does or the state does. Emergency  
20 planning is something which is a response of any type of  
21 social unit.

22 Q Do you think that very message gets to the public  
23 in this area?

24 A Yes, and it can be -- and it can -- the larger  
25 social or governmental agencies can help them. In other

1 words, to go back to the question on education, could focus  
2 on, what could family units do to facilitate their own  
3 planning, suggestions on what they might do, suggestions of  
4 information of how they might prepare, what they need to do  
5 in a particular instance.

6 So that if planning in the sense of emergency  
7 planning is built into the routines of everyday existence,  
8 then that is the best type of planning that there is. The  
9 worst type of planning is to plan so that everything is  
10 going to be completely different when an emergency occurs,  
11 and then nobody knows what to do.

12 (Pause.)

13 Q On page 5 of your testimony you indicated that  
14 planning should be based on what is likely to happen, not on  
15 the worst scenario. There are a number of people who felt  
16 that was exactly the state prior to TMI-2 accident, that the  
17 scenario which in fact occurred had not been planned for at  
18 all, or even anticipated. It was considered incredible.

19 A Well, again, this follows from my own notion that  
20 you build up -- you build up emergency planning essentially  
21 from dealing with those things that are most likely to  
22 occur, most likely to happen to you. In other words, you  
23 build your emergency structure based on certain types of  
24 emergencies that are now routine.

25 For example, traffic accidents have been

1 routinized, so to speak, and you build on top of that. The  
2 point that I was trying to make here is that sometimes --  
3 and it has been characteristic for people to sit around and  
4 think about the worst possible thing that would happen, and  
5 usually when you do that then the argument is that there is  
6 no way to plan for it, so it destroys, essentially,  
7 thinking.

8           And I usually -- some of these events, while they  
9 might occur, are really very unlikely or they occur so  
10 infrequently that they are sort of interesting academically,  
11 but they are not interesting in terms -- I usually call them  
12 immaculate conception scenarios. They happen every 2,000  
13 years.

14           And that -- they are very interesting, but they  
15 are really not relevant to the day to day activities in the  
16 routines that people have. So you have to look essentially  
17 to what might be a realistic scenario in terms of what you  
18 face.

19           And for example, if you plan, let's say, for a  
20 scenario in which you have, oh, I don't know, 50 people who  
21 may be killed or injured, that may be a very realistic  
22 scenario to deal with. Now, if you hit 100, you can build  
23 on that 50.

24           But after all, if you look at -- if you look at  
25 crisis history in the United States, for example, there have

1 only been three events in American history in which you have  
2 had as many as 5,000 people who have been injured in a  
3 particular event. These are very rare occurrences in our  
4 history.

5               And so that the point I am trying to make, if you  
6 pick an impossible situation, therefore the emergency  
7 planning tends to break down because you sit around thinking  
8 about how possible it is. If you look about what is likely  
9 to happen in terms of the range of experience of that  
10 particular community and build on those particular  
11 resources, if you do have something a little bit larger you  
12 can cope with it.

13           Q     I think one of the questions is, what is likely to  
14 happen in view of the experience of this community. I think  
15 that is one of the questions that is on the public's mind,  
16 that has to be addressed in emergency planning. That is not  
17 a question; that is a comment.

18               (Pause.)

19           Q     On page 3 of your 8 you made some comments about  
20 NUREG-0654, i.e.: "Although somewhat complex and  
21 overlapping, the 16 planning centers identified in  
22 NUREG-0654 adequately set forth the fundamental elements of  
23 a good radiological emergency response plan."

24               And I wondered if you might give in some more  
25 detail what you find weaknesses or unnecessary complexities

1 in 0654.

2 A Well, I think the point here is that a number of  
3 times, in developing a planning document, that you -- the  
4 form of it usually tends to take a listing in which you list  
5 a number of things to be considered in that. And sometimes  
6 at some later point this gets translated back, that  
7 everything in the listing needs to be included in the plan.

8 I think the point I was trying to make here is  
9 that the areas in which -- were isolated in the document  
10 were important areas to be considered in any planning  
11 document, but that every detail underneath did not  
12 necessarily have to be addressed in a specific plan. If the  
13 major category had been considered, that is the more  
14 important thing.

15 (Board conferring.)

16 DR. LITTLE: That completes my examination at this  
17 time.

18 CHAIRMAN SMITH: I don't know how we got out of  
19 phase here, Mr. Gray. But we have not forgotten you. As a  
20 matter of fact, the area of your cross-examination is very  
21 important, and I hope you explore it thoroughly.

22 CROSS-EXAMINATION -- RESUMED

23 BY MR. GRAY:

24 Q Dr. Dynes, you have had considerable experience in  
25 emergency and disaster operations planning, researching in

1 this area. In your experience, have you had the occasion to  
2 evaluate the response of emergency workers during an  
3 emergency?

4 A Yes.

5 Q Can you tell us what you found? I am specifically  
6 interested in the question as to whether emergency workers  
7 who have responsibilities for emergency operations, but  
8 also, for example, have families that live in the risk area  
9 and who also need protection, whether those emergency  
10 workers in your experience have carried out their emergency  
11 responsibilities.

12 A Yes, that is an old concern. And there are many  
13 different facets to it. But by and large, let me say, we  
14 checked at one time, I remember, going back to a number of  
15 incidents, and in terms of our recollections, really never  
16 run into anybody who abandoned an important emergency job --  
17 who left because of family conflict.

18 Now, I am saying it that way. That does not mean  
19 that people are not concerned about their families. But  
20 emergency workers, for example, most of you are here today  
21 carrying out certain obligations and you are separated from  
22 your families. And you probably will continue on those  
23 obligations even though you are separated.

24 One -- there are several things along this line.  
25 One, of them, that you can very often, if you have

1 information, can determine if your family is likely to be  
2 safe.

3               Secondly, sometimes people have an opportunity to  
4 be able to check with their family and continue their job.  
5 For example, if you are on the police force and your beat is  
6 on the other side of the city, then there is no reason, in  
7 an emergency message, you cannot tell your partner: Next  
8 time you go down the street, see if my house is there and  
9 let me know. He does not come over to see himself. It is  
10 simply reaffirming along that line.

11              Also, I think that particularly nowadays we should  
12 be particularly careful of how we define a family. We have  
13 a tendency, I suppose, to evoke the image of the fact that a  
14 family is a husband and wife and a couple of children, a  
15 couple of small children.

16              If you look at census statistics in the '80  
17 census, that is typical I think of about probably 15 percent  
18 of our population. So that -- in other words, in one sense  
19 it is a minor problem.

20              The answer is, in terms of actual operation people  
21 work out these potential conflicts, and the final answer is  
22 that people do not leave their jobs and if they have  
23 responsible emergency jobs, to follow -- to take care of  
24 that. So I say in effect it is a non-problem.

25              Q     Have you found any instances of emergency

1 operation failures, say for example an evacuation for  
2 hurricanes, emergency operations failures because of  
3 emergency workers not doing their responsibilities?

4 A No. No. I mean, the point is, if you have  
5 incompetent workers before the event, that event is not  
6 going to make them competent.

7 Q Getting more specific, as head of the task group  
8 for the Kemeny Commission investigating the Three Mile  
9 Island accident and the emergency response during that  
10 accident, did you come across any information indicating a  
11 reluctance of emergency workers in this area to perform  
12 their responsibilities?

13 A No.

14 Q Pardon?

15 A No. In fact, the usual problem is that people  
16 work too much and become very inefficient. It is not a  
17 problem of -- there tends to be in many emergency situations  
18 -- in fact, a very key element in emergency planning is to  
19 try to provide relief for people, so that they do not  
20 overwork themselves, along that line.

21 Q You have indicated here in your written testimony  
22 that you have at least briefly reviewed NUREG-0654. You  
23 have commented on the planning standards set forth in that  
24 document. In addition, you are obviously aware of the  
25 recommendations of the Kemeny Commission with regard to

1 emergency response at TMI.

2                   Can you indicate whether the planning standards  
3 and emergency planning carried out in accordance with the  
4 planning standards of NUREG-0654 would tend to resolve the  
5 types of problems identified by the Kemeny Commission with  
6 regard to emergency planning?

7                 A     Yes. I think through the document and through my  
8 brief recollection of the work that there has been  
9 considerable improvement in the emergency planning  
10 documents, and also in the thinking about emergency planning  
11 over a period of time. In other words, my notion, as  
12 indicated in the testimony, is that the plan is only one  
13 aspect of emergency planning.

14                 But I think that my recollection that before the  
15 accident a strong consideration of notions such as  
16 evacuation, questions of warning, a whole series of things,  
17 were pretty inadequate in the county plans as they existed  
18 at that time. And I would see reflected considerable  
19 improvement at all levels.

20                 Q     Getting to the level of detail that should be in  
21 emergency planning, can you give us any feel for what level  
22 of detail you believe emergency plans should exhibit with  
23 regard to education of the public on evacuation routes?

24                 A     Specifically on evacuation?

25                 Q     Yes.

1           A     Well, I would have to -- people -- organizations  
2 -- different people need different types of information. If  
3 we are talking about public information, I do not think that  
4 one needs to overly burden the public with a lot of  
5 technical details.

6                 I think the key message is what action needs to be  
7 taken. You know, it is very much, if I can use an analogy,  
8 it is very much like listening to a very complex report by a  
9 weather -- somebody giving you the weather. They give you  
10 all of the cloud flows and everything else. I do not want  
11 to know that. I want to know whether it is going to rain,  
12 so I can take my umbrella.

13                 And I think the important thing is to provide  
14 people with information so as to know what they should do  
15 and messages in that w<sup>e</sup> .

16                 (Pause.)

17           Q     What level of preplanning do you believe should be  
18 done to accommodate transients and people who do not  
19 normally live in an area, but may be there on a temporary  
20 basis?

21           A     Well, I suppose there are two levels. One would  
22 be that there may be types of public information that are  
23 important for transients, that could be posted in hotels or  
24 motels or where transients would be. I suppose the clearest  
25 example would be where you have a summer resort like Ocean

1 City. That would be some type of rudimentary type of  
2 information for those people that were there.

3 I think the other thing, certainly in any type of  
4 official plan, as an annex or a part of that plan, the  
5 planner should be conscious that this is a special  
6 population that might require special ways of reaching  
7 them.

8 So it is sort of a twofold type of response. They  
9 may create a special problem for public information; and  
10 secondly, they need be noted in the plan so the planners  
11 themselves don't forget them in the process.

12 MR. GRAY: We have no more questions.

13 CHAIRMAN SMITH: Dr. Dynes, to what extent did  
14 your task force actually specifically inquire into the  
15 willingness of emergency workers to remain at their posts?

16 THE WITNESS: I was not -- the research evidence  
17 was drawn from a wide variety of types of disaster  
18 situations, drawn from my own experience in a wide variety  
19 of situations.

20 CHAIRMAN SMITH: I am referring now to the actual  
21 task force study of the evacuation.

22 THE WITNESS: We did not deal with that particular  
23 problem in the task force. because you -- well, let's put it  
24 this way. I did -- if I go back in my recollection,  
25 occaionally you hear stories about this, about this type of

1 thing. And I recall hearing certain stories about that and  
2 people leaving their jobs.

3 I have been in enough of these situations to know  
4 how to distrust stories. And I am generally skeptical of  
5 most of those types of stories. For example, there is a  
6 wide mythology that looting is widespread in natural  
7 disasters, which is not true. And research evidence is very  
8 consistent along that line. Yet every report that you hear  
9 in the media starts out that there is widespread looting.  
10 But if you really track that down -- and I do not want to  
11 digress too far.

12 But I do not think it was a problem. I think the  
13 problem -- I do not think it was a problem in the Three Mile  
14 Island situation. It is probably true that some people who  
15 were on jobs, it was not very clear whether they should stay  
16 and they left. And you know, if somebody is on hospital  
17 staff and they got a weekend to come -- to go away, they may  
18 go away on vacation.

19 CHAIRMAN SMITH: Let's take that. Let's take a  
20 hospital staffing. I think that is a good example, because  
21 you do not have a professional like a policeman. You have  
22 people whose normal duty is not disaster or not of that  
23 nature.

24 What has been the experience in other disasters  
25 that you are familiar with as to the staffing of hospitals

1 where the hospital staff is at risk too?

2 THE WITNESS: No. Generally your problem is not  
3 loss of personnel, but too many personnel.

4 CHAIRMAN SMITH: Now, that is -- you feel  
5 confident in that statement, that where the hospital staff  
6 would be at risk in a disaster, that staffing has been  
7 adequate?

8 THE WITNESS: Yes.

9 CHAIRMAN SMITH: Yes. You are saying yes?

10 THE WITNESS: Yes. Yes, I am saying yes.

11 Let me explain it in a little context. Most  
12 organizations are overstaffed. Let me put it this way. You  
13 have a three-shift -- you have three eight-hour shifts. One  
14 way you can expand your personnel very easily is to go on  
15 12-hour shifts. You increase your personnel by one-third by  
16 that simple act, and most people can work 12 hours without  
17 any decrease in effectiveness.

18 The other thing that you have -- and I think this  
19 is important to remember -- it is a very simple thing and it  
20 is almost so obvious we forget about it, that most  
21 activities in the -- in a community that is going through an  
22 emergency close down. So this means you have an awful lot  
23 more personnel than you can utilize.

24 For example, going to school is irrelevant during  
25 an emergency. So you have teachers you could utilize.

1 CHAIRMAN SMITH: All right. That takes us to the  
2 next step. Police and firemen are well-trained  
3 professionals. You would expect them to, and you say that  
4 hospitals in fact do. They do what their regular business  
5 is. A nurse is a nurse, a doctor is a doctor.

6 But how about the other people who, during times  
7 of an emergency, are called upon to do duties different?  
8 For example, I would imagine that school buses are normally  
9 driven by housewives. Do you think that we can apply the  
10 lessons we have learned in other disasters and expect them  
11 to stay on duty?

12 THE WITNESS: Yes. That is their job, yes. And  
13 in fact, many people -- there is sort of a funny element  
14 along this line. Emergencies are interesting times. I  
15 mean, you know, people are still talking about TMI here,  
16 because it was a damn interesting time to be around.

17 Every community that I have been in, you know,  
18 does this. Xenia, Ohio, celebrates after the tornado every  
19 year. You know, you remember.

20 The point is, most of us live pretty humdrum  
21 lives, and our jobs are relatively routine, and it is sort  
22 of fun to get involved with something like this, something  
23 -- you know, it gives you cocktail conversation for the next  
24 two years. You tell your children.

25 So that people -- the point here is people like to

1 get involved.

2 MS. GAIL BRADFORD: I object to this. You were  
3 not here. You cannot testify that it was fun to be here at  
4 the time of the accident.

5 CHAIRMAN SMITH: Wait a minute, Ms. Bradford. You  
6 will have an opportunity.

7 THE WITNESS: So that --

8 CHAIRMAN SMITH: I think that you are making a  
9 point that should be explored. But you have to give the  
10 witness an opportunity to make his point.

11 THE WITNESS: The point I'm trying to make is that  
12 there is essentially a commitment to become involved in  
13 types of activities, particularly activities which help  
14 other people. Many of us do not have the chance to do  
15 that.

16 CHAIRMAN SMITH: Okay. Now, Ms. Bradford.

17 CROSS ON BOARD EXAMINATION

18 BY MS. GAIL BRADFORD:

19 Q Is it your opinion that it was fun to be here at  
20 the time of the Three Mile Island Unit 2 accident?

21 A I do not know whether -- did I use the word  
22 "fun"? It is an exhilarating experience in terms of any  
23 type of emergency situation as such, and the fact that there  
24 is still conversation and still concern about it indicates  
25 that. And I say that it is no different than any other

1 situation. People remember those things, talk about them,  
2 and remember where they were, remember what they did, and  
3 are rather proud of that.

4 (Pause.)

5 CHAIRMAN SMITH: Do you have any more questions,  
6 Ms. Bradford?

7 MS. GAIL BRADFORD: (Nodding in the negative.)

8 CHAIRMAN SMITH: Ms. Straube?

9 BY MS. STRAUBE:

10 Q Dr. Dynes, is the exhilarating experience you were  
11 talking about -- that is an after the fact feeling, is that  
12 not correct?

13 A No, during, very often.

14 Q Do you think that during an emergency somebody is  
15 going to stop to think about what an exhilarating experience  
16 it would be to help other people?

17 A Well, I think in large part maybe we are quibbling  
18 on words here. I think the point is that people get in  
19 situations in which they have an opportunity to help other  
20 people. And in our normal jobs very often that does not  
21 happen. The general experience is people feel very positive  
22 to that.

23 Q Even when their own lives are at stake?

24 A Well, the same thing is true in other threat  
25 situations, too.

1 (Pause.)

2 CHAIRMAN SMITH: Is there anything -- Mr Zahler?

3 MR. ZAHLER: I have one redirect question.

4 REDIRECT EXAMINATION

5 BY MR. ZAHLER:

6 Q Dr. Dynes, would it be fair to characterize the  
7 position that you enunciated in the last few minutes, that  
8 people rise to the occasion during an emergency?

9 A Yes. I think the way we got started off on it was  
10 the question of manpower, and I was pointing out that many  
11 people, man and womenpower as such, that many people are  
12 drawn in to help and therefore the question of personnel --  
13 and I think one consequence of this is that, because they  
14 get involved, there is a certain degree of rising to the  
15 occasion, if you want to term it in that way.

16 CHAIRMAN SMITH: Ms. Bradford?

17 MS. AAMODT: Mr. Smith, is it possible for me to  
18 question?

19 CHAIRMAN SMITH: Wait a minute, wait a minute. I  
20 did not hear you. Would you begin again?

21 MS. AAMODT: I'm sorry. Mr. Smith, is it possible  
22 for me to redirect some questions to Mr. Dynes?

23 CHAIRMAN SMITH: Well, you were expected to  
24 consolidate your examination with Ms. Bradford.

25 MS. AAMODT: I do not know how you can do that on

1 redirect, in the few minutes that we have. I did not know  
2 how to do that on redirect. There is no time to do that  
3 here.

4 CHAIRMAN SMITH: You did not even sit in the  
5 vicinity of Ms. Bradford, so I don't know how you could have  
6 done it in any event.

7 But don't you understand the instructions of the  
8 Board as to consolidated Intervenors on this issue?

9 MS. AAMODT: I certainly do, Mr. Smith. I do  
10 understand that. And I have studied some of Mr. Dynes' work  
11 and I was anxious to ask some questions. Some things came  
12 up that I felt I could possibly follow through on redirect.

13 CHAIRMAN SMITH: You are confusing me about  
14 redirect. Do you mean follow-on cross-examination?

15 MS. AAMODT: Follow-on, I am sorry. Follow-on,  
16 yes.

17 CHAIRMAN SMITH: And you have questions that you  
18 could not have coordinated with Commonwealth?

19 MS. AAMODT: Well, I could not have coordinated  
20 --

21 CHAIRMAN SMITH: Do you have questions that you  
22 could not have coordinated with Ms. Bradford?

23 MS. AAMODT: I think I do, yes.

24 CHAIRMAN SMITH: Okay.

25 MS. AAMODT: And I also understood, Mr. Smith,

1 from your directions, I could follow up or even  
2 cross-question on areas that had to do with farmers, since  
3 we are the only farmers.

4 CHAIRMAN SMITH: We made one exception to the  
5 coordination rule and that is the testimony on your  
6 contention, that you would not be expected to coordinate for  
7 cross-examination on the one particular contention. But  
8 everything else you will be expected to fully -- you are  
9 fully consolidated, just as if there is one Intervenor.

10 MS. AAMODT: Will there be time, then, since there  
11 are a number of Intervenors and it is difficult to do this  
12 while we are attempting to listen? Is it possible, then, we  
13 can have a recess before we have follow-on?

14 CHAIRMAN SMITH: I think that is something you  
15 should have coordinated with Ms. Bradford during the  
16 recess. You should be consistently coordinating. It is  
17 difficult. We will give you time to do it, yes. Sometimes  
18 you cannot do it because you cannot do it as it goes along,  
19 because it would be distracting for you to be tugging on her  
20 arm and passing her notes.

21 But you are expected, as it goes along, to work in  
22 your questions with Ms. Bradford or whoever is, for the  
23 particular examination, taking the role as the lead  
24 Intervenor.

25 Now you may begin to ask your follow-on

1 questions. But I think that we stated that quite expressly  
2 and we are going to enforce it.

3 MS. AAMODT: Well, I could certainly give them to  
4 Ms. Bradford to ask. I do not know whether she could  
5 understand my handwriting or the order which I have them  
6 in. But I would be very happy to do that.

7 CHAIRMAN SMITH: You just begin with your  
8 examination. But you see, we approach it with a little bit  
9 of skepticism when a party has no basic cross-examination  
10 plan, then has extensive follow-on or substantial  
11 follow-on. That suggests cross-examination of opportunity  
12 rather than any particular plan.

13 MS. AAMODT: Well, Mr. Smith, I did study this,  
14 but not being the lead Intervenor -- I did study Mr. Dynes'  
15 testimony and references.

16 CHAIRMAN SMITH: Did you submit examination  
17 questions to the lead Intervenor?

18 MS. AAMODT: I had intended to, but the date was  
19 set up -- I understood we were on, to debate on Saturday  
20 whether Mr. Dynes' testimony would be admitted. I did not  
21 understand we would also entertain Mr. Dynes' testimony.

22 CHAIRMAN SMITH: You had no information from the  
23 Board which would justify any such conclusions. As a matter  
24 of fact, we repeatedly informed the Intervenors that we may  
25 begin testimony as early as yesterday.

1           But you begin your examination -- Ms. Bradford?

2           MS. GAIL BRADFORD: Earlier this afternoon you  
3 asked me whether I was clear about what my role as lead  
4 Intervenor was, and I thought this afternoon and in your  
5 written order you said that I am representing ANGRY,  
6 Newbury, and ECNP on emergency planning issues. Is that  
7 accurate?

8           CHAIRMAN SMITH: Let me get the order and read it  
9 to you.

10           (Pause.)

11           CHAIRMAN SMITH: Now there is no confusion about  
12 there being a lead Intervenor at the hearing at all times to  
13 represent all Intervenors on procedural matters. There is  
14 no question about that?

15           MS. GAIL BRADFORD: Yes, sir.

16           CHAIRMAN SMITH: You are talking now about  
17 cross-examination. Now let me read the order:

18           "Consolidated cross-examination plans for offsite  
19 emergency planning testimony shall be filed on behalf of all  
20 Intervenors. The cross-examination of offsite emergency  
21 planning testimony shall be conducted by a designated lead  
22 Intervenor for each set of testimony to be examined.

23           "The only exception currently anticipated by the  
24 Board is that of the Aamodt family Intervenors" -- "is th  
25 the Aamodt family Intervenors will be permitted to conduct

1 cross-examination on their one offsite emergency planning  
2 contention, EP-2, if they wish.

3                 "It is not required that the same Intervenor be  
4 the lead Intervenor for cross-examination on all sets of  
5 testimony. This ruling is based upon our observation that  
6 the contentions of the different Intervenors are similar and  
7 intertwining.

8                 "Consistent with our previous rulings, any other  
9 Intervenors seeking leave to cross-examine must demonstrate  
10 why the lead Intervenor could not have asked the questions.  
11 Showing that a particular contention has no similarity to  
12 contentions of other Intervenors would provide a good cause  
13 for separate question."

14                 That is not involved here.

15                 "Duplicative cross-examination will not be  
16 permitted."

17                 So this is the first time you have actually been  
18 faced with the problem, and it is -- so we are going to take  
19 you through your cross-examination. But after this you  
20 should -- you should accept, where you have a particular  
21 contention where that lead Intervenor cannot represent your  
22 interest, you should regard yourself as a single  
23 Intervenor.

24                 MS. AAMODT: It is a hard thing to do with the  
25 --

1 CHAIRMAN SMITH: I know it is difficult. It is  
2 provided for in the Commission rules. It is a traditional  
3 method of regulating cross-examination and regulating a  
4 hearing in complex cases. It requires effort.

5 MS. AAMODT: Mr. Smith, from now on I wonder if we  
6 could have some time, then, for discussion among the  
7 Intervenors.

8 CHAIRMAN SMITH: Yes. I suggest after this that  
9 you work together. You have indicated in the past that you  
10 prefer not to work with the Intervenors on emergency  
11 planning. You are going to be required to if you are going  
12 to participate.

13 MS. AAMODT: That is not a correct statement or  
14 interpretation of my statement. My statement is that it is  
15 difficult for me to do that.

16 CHAIRMAN SMITH: Notwithstanding the difficulty,  
17 we are going to require it, Mrs. Aamodt. Now, you may start  
18 with your cross-examination.

19 MS. AAMODT: It is also difficult, Mr. Smith, for  
20 you making the assumption that all the Intervenors' aims in  
21 this hearing are identical and that we are essentially an  
22 entity. But I will try to work with that, but I do think  
23 that is --

24 CHAIRMAN SMITH: You will have to work with it,  
25 Mrs. Aamodt, if you are going to participate. This is a

1 firm ruling of the Board. And you are going to have to  
2 demonstrate virtual impossibility, and I do not see how you  
3 can do it.

4 But go ahead with your cross-examination.

5 CROSS-EXAMINATION -- RESUMED

6 BY MS. AAMODT:

7 Q I do not believe any of these questions are  
8 repetitive, and I would prefer that we had a very brief  
9 answer, Mr. Dynes, if we could.

10 Your principal job until 1979 was teaching and  
11 research. Was this research and publication a requirement  
12 of your teaching job, to maintain your teaching job?

13 CHAIRMAN SMITH: Why is that follow-on  
14 cross-examination? Why that --

15 MS. AAMODT: I think it is very --

16 CHAIRMAN SMITH: I am not talking about whether it  
17 is important, Mrs. Aamodt. I am asking why that is  
18 follow-on examination.

19 MS. AAMODT: Well, we have inquired into his  
20 background. You did. I am following on your examination  
21 when we came back from the recess.

22 CHAIRMAN SMITH: If that is what you are doing,  
23 then it is not relevant to my examination. This is a  
24 question that clearly would have been appropriate for  
25 cross-examination.

1           Go ahead with your next question.

2           MS. AAMODT: I give up, Mr. Smith.

3           CHAIRMAN SMITH: Any further examination?

4           MS. GAIL BRADFORD: I do have a question about  
5 what we were talking about, about the reaction of a  
6 population, whether you describe it as exuberance or  
7 whatever. I forget what word you used, actually.

8           CHAIRMAN SMITH: Exhilaration.

9           MS. GAIL BRADFORD: Exhilaration, yes.

10          BY MS. GAIL BRADFORD: (Resuming)

11          Q        What studies -- or have any studies been done to  
12 document what people's reactions are during a situation  
13 which has potentially tragic results?

14          A        The last phrase?

15          Q        During a situation which has potentially tragic  
16 results.

17          A        If you will recall, I was answering a question in  
18 terms of manpower, in terms of manpower in a specific  
19 situation. My comment was the fact that many people are  
20 willing to help. They get a kick out of it, along that  
21 line, so to speak. It is a meaningful thing, along that  
22 line.

23                 Now, if you ask, there are a whole series of  
24 studies referring in general to the phenomenon that I am  
25 talking about. Go back to studies of Charlie Fritz done in

1 1954. I can give you a whole series of citations on them.

2 The point is that an event like a natural  
3 disaster, like a series of other things, are important  
4 events in community lives. They remember that, even if they  
5 are tragic.

6 One of the things that keeps them from being  
7 tragic -- it is the fact that there is always somebody else  
8 in the community that is worse off than you are. In other  
9 words, there is tragedy in every American community day by  
10 day by day. Most of those tragedies are not shared. The  
11 difference between an event where you have a number of  
12 people who were injured is that there is always somebody  
13 else who is worse off than you are, and therefore it tends  
14 to take -- it tends to put a brake on grief.

15 So that in effect, actually one of the somewhat  
16 peculiar consequences of a number of events is the increase  
17 in morale in communities, because something significant has  
18 happened to them. Some of it is bad. And therefore, they  
19 feel good about -- very often about themselves and about the  
20 community.

21 It is a very, very common phenomenon. They very  
22 often celebrate the event a year later and remember.

23 Q Is this -- is this a personal opinion or based on  
24 studies, or what? A

25 I told you, I will give you, if you want, a whole

1 bibliography on that.

2 Q So it is based on studies?

3 A Sure.

4 Q And based on your studies, is it your opinion that  
5 what you are describing as a reaction was the reaction of  
6 this area's population to the Three Mile Island accident?

7 A I have not -- I do not know of any studies from  
8 this particular community. It is obviously an important  
9 event in the life of this community. There are a lot of  
10 similarities. People still talk about it, remember it.

11 Your newspapers probably commemorate the event. You  
12 probably -- maybe have church services. You probably have  
13 slogans.

14 Q Do you feel that the Three Mile Island accident  
15 increased morale in this area?

16 A It probably created a degree of community  
17 cohesion. That would be -- I do not have any measures of  
18 what it was before. I suspect there is a greater interest  
19 in politics.

20 Q I guess -- I guess I see, without having any  
21 credentials in sociology, I guess I see a distinction here  
22 between community morale where people might have increased  
23 reactions with each other and a person's own sense of his  
24 own morale. You are saying that the Three Mile Island  
25 accident might have increased the community's morale? Yes,

1 no?

2 A You are pulling it down to the specific and I  
3 cannot comment on the specific along that line. I would say  
4 a general response to essentially a crisis event on the part  
5 of a community in American society is an increase in  
6 morale.

7 Q Now, when you use the word "morale" in that  
8 sentence you mean community morale as opposed to a person's  
9 own sense -- outlook on life, whether he might be more  
10 optimistic about life?

11 A Well, I was talking about morale at the community  
12 level as such. I am not talking about individuals. That is  
13 a separate issue, and maybe it is a little bit more  
14 complicated. But by and large, there is some evidence that  
15 even on the individual level crisis events tend to provide  
16 some indications of increased morale. For example, less  
17 drug-taking, less drinking, that type of thing.

18 Q Do you have any opinion, based on your studies  
19 with the Kameny Commission and on your studies of other --  
20 the detailed studies of disaster events in other areas -- do  
21 you have any opinion whether you would expect personal  
22 morale in this area to be higher or lower two years later  
23 after the accident than it was before the accident?

24 MR. ZAHLER: Mr. Chairman, I do not know how to  
25 handle this situation. The examiner is opening the door to

1 the psychological stress issue outside of emergency  
2 planning.

3 I do not mind Dr. Dynes answering the questions.  
4 I would object if whatever answer he gives forms a basis for  
5 further examination or further evidence in this area. And  
6 if that would be the case, then I do object to the  
7 examination.

8 CHAIRMAN SMITH: I was conferring with Dr. Little  
9 when that question was asked and I missed it. But I was  
10 aware that she was heading into that general area.

11 What was the question, Ms. Bradford?

12 MS. GAIL BRADFORD: Whether in his opinion, based  
13 on his studies with the Kemeny Commission and in his general  
14 knowledge of disaster situations, that it would be his  
15 opinion that personal morale of the people in this area has  
16 increased or decreased as a result of the Three Mile Island  
17 accident.

18 CHAIRMAN SMITH: That was the question -- that was  
19 the question when I started to confer with Dr. Little a  
20 couple of questions ago. Wasn't there one since then?

21 MR. ZAHLER: We went around --

22 CHAIRMAN SMITH: Based upon the Kemeny Commission,  
23 that is the difference. All right.

24 MR. GRAY: Mr. Chairman.

25 MS. GAIL BRADFORD: I was just trying to see --

1 the community morale, the personal morale.

2 CHAIRMAN SMITH: All right. Mr. Gray?

3 MR. GRAY: Mr. Chairman, if I might point out, it  
4 is my recollection of the witness' testimony that when he  
5 referred to morale and exhilaration he was talking about  
6 during the occurrence of the event, when people were  
7 working. This is getting into morale after the Three Mile  
8 Island accident, which is considerably different than what I  
9 believe this witness testified to. So I would like to point  
10 that out.

11 CHAIRMAN SMITH: Well, that is right. It did not  
12 occur to me. Of course, we were aware of the relationship  
13 of psychological stress and psychological effects to conduct  
14 during an emergency. But I do believe the observation is  
15 correct, that the effect after the emergency is outside of  
16 our permissible scope of inquiry.

17 MS. GAIL BRADFORD: Let me tell you where I am  
18 trying to go with this, and I think it is -- it is difficult  
19 to get at these questions. This is a personal opinion, and  
20 I do not have any qualifications in the field, that because  
21 of the memories, whatever you want to call it, of the  
22 accident, I think that people in this area will have a  
23 different kind of response to a second TMI evacuation,  
24 because it is a second TMI reaction -- evacuation.

25 And I thought I heard him say that he felt that

1 people individually had a kind of positive feeling about the  
2 TMI accident or some kind of feeling that those -- that was  
3 an exciting time or that it was something memorable, that  
4 --

5 CHAIRMAN SMITH: Okay. I heard him. Now where  
6 are you going to go from there?

7 MS. GAIL BRADFORD: It seems to me that in the  
8 event of a second evacuation, upon hearing sirens or  
9 whatever, that people could have a reaction of: Oh, no, not  
10 that again, I am not going to listen to this, I will not  
11 turn on the radio.

12 CHAIRMAN SMITH: Denial.

13 MS. GAIL BRADFORD: Denial, yes.

14 Or they could have a more positive: Oh, boy, here  
15 it comes again.

16 CHAIRMAN SMITH: I think you are going in an  
17 appropriate direction. And while you are at it, however,  
18 one of the things that is troubling me about the exchange,  
19 we do not seem to be talking about any bell-shaped curves in  
20 this context, either. We seem to be talking about the  
21 timid, the foolhardy, the temporarily exhilarated. There is  
22 no differentiation.

23 I don't know how productive the whole thing has  
24 been, but I think you should ask if the effects of the  
25 accident are such that there would be a substantial part of

1 the population who would block out the experience and deny  
2 the reality of it, and if that is a problem. Does that go  
3 where you want to?

4 MS. GAIL BRADFORD: Yes.

5 BY MS. GAIL BRADFORD: (Resuming)

6 Q Did you get the question?

7 A The problem is, we are talking about a variety of  
8 things here. I think if you will, in general, people will  
9 be more -- if you are talking about warnings and if you are  
10 talking about sirens going on, people will be very sensitive  
11 to those types of things.

12 CHAIRMAN SMITH: Dr. Dynes, just within my own  
13 experience, I know some people are immobilized with fear.  
14 Maybe your experience is different than mine. But I know  
15 that people that I know very well cannot conduct themselves  
16 very well under stress.

17 And I would question the credibility of your  
18 testimony if you deny those people exist. I cannot deny my  
19 entire lifetime experience of people I have seen who cannot  
20 function under stress. Now, there must be somewhere in this  
21 community a sizable amount of people who are going to have  
22 difficulty functioning, and if you disagree with that I  
23 would like to know about it.

24 But you are going to have to change a lifetime of  
25 observation on my part.

1           THE WITNESS: Well, I do not know what you mean,  
2 "function." Along that line -- and maybe certain complex  
3 type of jobs. But I think here, where we are talking about  
4 essentially a simple action, what would a siren mean,  
5 certainly it would create a degree of anxiety. And there  
6 might be a certain amount of fear.

7           But that is different in terms of whether they  
8 would behave -- I mean, whether they would evacuate. The  
9 point is, there might be heightened anxiety, but they would  
10 still evacuate.

11           CHAIRMAN SMITH: Everybody?

12           THE WITNESS: No, not everybody.

13           CHAIRMAN SMITH: The question is, because of the  
14 first experience, has there been created in a significant  
15 part of the population a psychological condition which would  
16 tend to impede them from acting correctly in another  
17 emergency?

18           THE WITNESS: I would say, on the basis of what I  
19 know about repetitive disasters, the answer would be no.

20           CHAIRMAN SMITH: Okay.

21           (Pause.)

22           CHAIRMAN SMITH: Are you concluded, Ms. Bradford?  
23 You just do not believe him. Ms. Bradford, you are not  
24 saying anything.

25           MS. GAIL BRADFORD: I know, sir. I think slowly

1 sometimes.

2 CHAIRMAN SMITH: Well, I do not want to rush you.  
3 I want to know if you do want to continue on.

4 MS. GAIL BRADFORD: I guess I am just trying to  
5 decide whether it is productive to continue.

6 I guess that is all. Thank you.

7 CHAIRMAN SMITH: All right.

8 Ms. Aamodt, have you reconsidered?

9 MS. AAMODT: I just feel as though we have a  
10 misunderstanding in what I was attempting to do, and I do  
11 not know how --

12 CHAIRMAN SMITH: Ms. Aamodt, we ruled that one  
13 question could not be answered. I told you to continue.  
14 Now, as we go throughout the rest of this hearing, there are  
15 going to be other occasions when there is going to be a  
16 ruling against you, and you are just going to have to either  
17 continue or not.

18 MS. AAMODT: I thought it was such a direct  
19 follow-on, but perhaps I --

20 CHAIRMAN SMITH: Do not reargue that ruling.  
21 Continue with your questions if you want to.

22 MS. AAMODT: If Ms. Bradford is finished, I  
23 thought I could set next to her and she can ask some of  
24 these questions.

25 CHAIRMAN SMITH: You are allowed to ask these

1 questions. But we ruled the one particular question was not  
2 follow-on, and that threw you for a loss. Now, you are  
3 going to have to become accustomed to having rulings against  
4 you.

5 MS. AAMODT: Perhaps the -- perhaps the -- perhaps  
6 I could tell you the thrust of my questioning on Mr. -- was  
7 to establish lack of candor of the witness, in that I feel  
8 he has gone far from the studies that he has conducted. And  
9 I have studied those studies and I know the areas of thrust  
10 of those studies, and they are essentially --

11 CHAIRMAN SMITH: I understand, Mrs. Aamodt. But  
12 that could and should have been done on original  
13 cross-examination. It is not follow-on.

14 Mrs. Aamodt, we have had a persistent problem in  
15 your intervention that you do not accept rulings. You  
16 persist in arguing them after they are made. Now, the  
17 ruling is that you cannot ask that question.

18 MS. AAMODT: I was just trying to prepare the way  
19 for the next question, which I --

20 CHAIRMAN SMITH: Proceed with your next question.

21 BY MS. AAMODT: (Resuming)

22 Q Mr. Dynes, have you studied any manmade disasters,  
23 not threats but disasters manmade?

24 A Certainly.

25 Q Could you point in your resume to which study that

1 would be?

2 A I assume there is some material on the Alaskan  
3 earthquake. I have not looked at my resume in a while.

4 Q I said manmade, not natural disaster.

5 A Manmade?

6 Q Yes.

7 A Are you referring to specific articles or books or  
8 what?

9 Q I am referring to any study which deals with any  
10 manmade disaster, not a threat but a disaster.

11 A Most of them deal -- most of the studies deal with  
12 manmade. Most of the ones have references to them. The  
13 book on organized behavior and disaster --

14 Q I cannot hear you. I am sorry.

15 A Well, practically every one on the resume would  
16 have some reference to natural disaster.

17 Q If you could just --

18 A In terms of manmade, if you want civil  
19 disturbances --

20 Q Where is that?

21 A Well, a whole series of articles appearing '74,  
22 '72. Some other things involve toxic threats.

23 Q Where would that be? That would be more pertinent  
24 than the --

25 A Most -- some of the -- the trouble is, I am sorry,

1 my articles are not catalogued according to agent. They are  
2 catalogued according to phenomenon and essentially any of  
3 the articles, for example, that are dealing with  
4 organizational relationships in communities under stress  
5 deal with a whole variety of agents.

6                 The same thing is true of helping behavior. The  
7 same thing is true of all of them.

8                 Q      If you could just give me a single manmade  
9 disaster and a single study which deals with that.

10                A      I am sorry, I do not write that way.

11                CHAIRMAN SMITH: You refer to chemical spills. Do  
12 you have -- an assessment of social impacts of oil spills.  
13 That is not a threatening situation, that is environmental.  
14 That wouldn't be appropriate.

15                THE WITNESS: The point -- the point I am trying  
16 to make is the fact that most of my writing looks at  
17 phenomenon in terms of a wide variety of different types of  
18 agents, and to try to isolate a particular agent -- a  
19 particular article on a particular event does not make any  
20 sense to me. I do not write that way.

21                CHAIRMAN SMITH: Well, notwithstanding that, see  
22 if you can't answer her questions for the purpose of the  
23 hearing.

24                THE WITNESS: But --

25                MR. ZAHLER: Mr. Smith, might I rephrase the

1 question. Is there discussed in any one of these articles  
2 some aspect about a manmade disaster? It is not that the  
3 article has to be solely about that. Is a manmade disaster  
4 discussed in any one of these articles?

5 THE WITNESS: It cuts through almost any one.

6 MR. ZAHLER: Can you, from your recollection,  
7 remember a particular manmade disaster that is discussed in  
8 any one of these articles?

9 CHAIRMAN SMITH: Campus riots, civil disorder?

10 THE WITNESS: Campus disorder, toxic spills.

11 BY MS. AAMODT: (Resuming)

12 Q Were any lives lost in the toxic spills? Were  
13 lives lost?

14 A Toxic spills, chlorine barges, derailments, a  
15 whole series of --

16 MR. ZAHLER: Were lives lost in any of the toxic  
17 crises that you studied?

18 THE WITNESS: As I recall -- I am sorry, we are  
19 dealing with a hundred of them. The exact statistics -- I  
20 would say yes, as I recall the chlorine barge where two  
21 people were killed.

22 BY MS. AAMODT: (Resuming)

23 Q What?

24 CHAIRMAN SMITH: Did you study the Snake River  
25 Dam?

1           THE WITNESS: The Grand Teton?

2           CHAIRMAN SMITH: Yes. Did you study that?

3           THE WITNESS: The center did. Dam break would be  
4 another example -- thank you -- along that line.

5           CHAIRMAN SMITH: Where lives were lost?

6           THE WITNESS: Right.

7           CHAIRMAN SMITH: Is that helpful?

8           MS. AAMODT: Yes, that helps me.

9           BY MS. AAMODT: (Resuming)

10          Q       How did you conduct your studies? Did you do them  
11 by form of interview? Is that how your studies are  
12 conducted?

13          A       Well, the studies were done -- we are talking  
14 about a wide variety of different types of studies at  
15 different stages of the events. If we were studying the  
16 emergency -- if I can take an example, if we were studying  
17 the emergency period -- let's take a specific example, the  
18 Alaskan earthquake.

19           The Alaskan earthquake occurred on a Friday  
20 afternoon. I was there Saturday afternoon with five other  
21 staff people, and we spent the week of the emergency period  
22 observing in different organizations at that particular time  
23 during the emergency period. Then on that basis, we decided  
24 that there were certain aspects that we were more interested  
25 in than others and that therefore we interviewed people in

1 state civil defense and the public works departments.

2 So a variety of different types of forms were used  
3 all the way from interviews, which might range anywhere from  
4 one hour to, I can recall some interviews, eight or nine  
5 hours, with people in particular organizations.

6 Q What were the -- were the thrusts of your studies  
7 to determine how lives could be saved in future disasters,  
8 or were there other aspects that you were interested in?

9 A Well, I do not -- there is no single motive. I  
10 think the point was the fact that we knew very little about  
11 that phase of life. In other words, they were inherently  
12 difficult to study and some of the earlier research which  
13 had been done in the 50's concentrated primarily on looking  
14 at disaster victims a year later.

15 Our own particular interest was to look at the way  
16 in which communities respond to disaster and particularly  
17 focusing on the emergency period. Later studies looked at  
18 different stages in the time frame.

19 CHAIRMAN SMITH: Dr. Dynes, I would like to remind  
20 you that Mrs. Aamodt at the beginning of her examination,  
21 before I interrupted her, made a particular request that you  
22 give short, concise answers.

23 THE WITNESS: Okay. I am sorry.

24 I described the research program. It goes over 16  
25 years. It is difficult to do it in one sentence.

1 CHAIRMAN SMITH: Sure.

2 MS. AAMODT: I appreciate that.

3 BY MS. AAMODT: (Resuming)

4 Q If you say that you were interested in studies of  
5 the emergency period -- now, I have read some of your  
6 studies, and were you not interested in many of your studies  
7 in the period after the emergency? Wasn't that the thrust  
8 of your studies?

9 A Some, yes.

10 CHAIRMAN SMITH: All right. Mrs. Aamodt, I am  
11 going to interrupt here again. You began this line of  
12 questioning on the premise that it was follow-on examination  
13 with respect to manmade disasters. And then, after one  
14 question we forgot all about manmade disasters, and now we  
15 are making an examination which would have been expected and  
16 appropriate on the original cross-examination.

17 MS. AAMODT: Maybe I should --

18 CHAIRMAN SMITH: I cannot see it as follow-on  
19 examination.

20 MS. AAMODT: I am trying to find out what Mr.  
21 Dynes would know about planning for emergencies that would  
22 be related, for instance, to the farm community in this  
23 area, and their ability to take action. And I am trying to  
24 find out what kinds of studies he has done that he can --  
25 that we can use him as an expert witness in that area.

1 CHAIRMAN SMITH: Okay. In the absence of  
2 objection, I will allow him to answer.

3 THE WITNESS: I did not catch one phrase,  
4 something --

5 BY MS. AAMODT: (Resuming)

6 Q Can you tell me where the studies are where you --  
7 where you studied precisely the emergency, rather than the  
8 ability to organize after the emergency? Where did you --  
9 did you study anyplace, for instance, notification, whether  
10 the notification of an emergency was adequate? Is that any  
11 place in your studies?

12 MR. ZAHLER: Objection.

13 CHAIRMAN SMITH: What is the basis of your  
14 objection?

15 MR. ZAHLER: The question is the exact same one it  
16 was before, that is, has he studied the emergency response.  
17 I do not mind if Mrs. Aamodt goes right to the point, has he  
18 done any studies that provide any information about farm  
19 evacuation or farm emergency planning. I do object to this  
20 lengthy prefatory examination that is going over the same  
21 ground again, that is not follow-on cross-examination.

22 I have no objection to the question about farm  
23 evacuation. I do not know what the answer is going to be.  
24 But if that is er interest, let us have her ask that  
25 question and move on.

1 CHAIRMAN SMITH: Well, Mrs. Aamodt has stated  
2 before that she wishes that she had some help in her  
3 cross-examination. She does not and she does the best she  
4 can.

5 But you can see what Mr. Zahler's concern is.  
6 Sometimes it does seem to take you a while to get to the  
7 thrust of your question.

8 MS. AAMODT: I am sorry. What I want -- is the  
9 question all right to ask, what studies Mr. Dynes has done  
10 on notification?

11 BY MS. AAMODT: (Resuming)

12 Q Have you ever studied how the emergency maybe  
13 would have been better handled as a function of the kinds of  
14 notifications that were used? A  
15 Certainly, yes.

16 Q You have studied it? Is it anywhere here in your  
17 resume?

18 A Well, yes, in many of the different articles,  
19 right. We are -- the point is, we are talking about a  
20 complex process.

21 Q All right, okay. Okay.

22 In what studies have you compared the ability to  
23 take action as a function of the degree of planning? You  
24 are advocating a lesser degree of planning, evidently, from  
25 your testimony. What studies have you done that compares

1 the results as with detailed planning versus the results  
2 with -- with less detailed planning?

3 A The center for a number of years monitored 16  
4 cities across the United States and looked at the planning  
5 and their response to a wide variety of different types of  
6 events. And I think that I am not sure if I can point to a  
7 specific -- whether it is in here or whether it is in other  
8 places.

9 But that is looking at cities, looking at the way  
10 in which they responded to a variety of events over a  
11 ten-year period.

12 Q Have the results been better where there was less  
13 detailed planning?

14 A Well, one of the -- one cannot single out a  
15 specific particular event in a very complex process. In  
16 other words, what you are doing is singling out one factor  
17 and everything else had to be held constant. We do not have  
18 that type of data.

19 By and large, on the basis of observing  
20 communities, detailed, very detailed plans tend to be  
21 ignored because nobody is going to read them when you are  
22 going to deal with an emergency. And by and large it has  
23 been my observation on that specific thing, hospital plans  
24 which are very detailed tend to be ignored.

25 R. LITTLE: Could I interject something I think I

1 can track into the point. Have you done any studies in  
2 primarily rural communities in which farming was the primary  
3 occupation, particularly livestock farming, livestock  
4 raising and marketing?

5 THE WITNESS: No, I do not have as much experience  
6 there. Primarily our focus at the center over a long period  
7 of time was to look at, primarily at planning in social  
8 units of some size, in other words primarily urban areas.

9 DR. LITTLE: Are you aware if there is a body of  
10 information that has been developed in studying response of  
11 rural communities?

12 THE WITNESS: I think the Department of  
13 Agriculture at times has done some work on that. There has  
14 not been extensive work.

15 DR. LITTLE: And certainly none specifically  
16 directed toward nuclear incidents?

17 THE WITNESS: No.

18 BY MS. AAMODT: (Resuming)

19 Q Did you question or interview any of the farmers  
20 in the TMI-2 area after the accident?

21 A Did I?

22 Q Yes.

23 A No.

24 Q You did not in your --

25 A No.

1 Q -- study with the task force?

2 Did you interview other people who evacuated? Did  
3 you talk with other people?

4 A No.

5 Q You did not.

6 A There were a number of studies that were done on  
7 the evacuation, right. But I did not do them.

8 Q Did you -- did you study at all what happened to  
9 the pet population in the area as a result of the planning?

10 A No.

11 Q Did you -- this is not directly -- did you study  
12 what happened at the hospitals in personnel leaving the  
13 hospitals and evacuating at the time of the accident?

14 A The --

15 Q Did you study that, the personnel who left some of  
16 the hospitals in the area?

17 A I heard a number of stories along that line. I  
18 did not study it.

19 Q How do you -- how do you bring that together with  
20 your previous testimony? How do you reconcile that with  
21 your testimony that people did not leave?

22 A I said I heard a number of stories. I have heard  
23 such stories in other situations. The response to the  
24 question here was on staffing hospitals, and I said in  
25 general, looking at a number of situations, that staffing is

1 no problem.

2 CHAIRMAN SMITH: The question I think related  
3 specifically to the accident here, didn't it, Mrs. Aamodt?

4 MS. AAMODT: Yes. The reports I read that a  
5 number of --

6 CHAIRMAN SMITH: I understand that in response to  
7 my question you already said you made no study of emergency  
8 workers staying on their posts.

9 THE WITNESS: Yes.

10 MS. AAMODT: I wonder how he reconciled that with  
11 the number of research studies he has done, which indicate  
12 that that is not true, that they do not leave.

13 BY MS. AAMODT: (Resuming)

14 Q Is it because they are not considered emergency  
15 --

16 CHAIRMAN SMITH: How can you reconcile on the one  
17 hand he made no study with, on the other hand, where studies  
18 were made, he had conclusions? I mean, there is no  
19 reconciling to be done. He has no information about your  
20 --

21 MS. AAMODT: I thought we were in general  
22 agreement that was true. He seemed to have some knowledge  
23 of that. I did not --

24 CHAIRMAN SMITH: I think we established now he has  
25 no knowledge as concerning the accident.

1 MS. AAMODT: You have no knowledge, and yet you  
2 were on the task force, you were on the President's Kemeny  
3 Commission task force, were you not?

4 THE WITNESS: I -- I am sorry, I lost the train of  
5 the question. I did not study the Hershey situation, if  
6 that is the question. That was not my responsibility on the  
7 Kemeny Commission.

8 BY MS. AAMODT: (Resuming)

9 Q Your philosophy, not planning in detail, can you  
10 tell me how that could work out for a farmer who must  
11 shelter maybe 50 to 100 cattle and provide water for them in  
12 55-gallon drums, and cover feed and so forth, how he would  
13 be able to do that if he had not planned to have drums and  
14 all those details, covers for the feed and so forth?

15 A You lost me on the first assumption. I do not  
16 think I said one should not plan.

17 Q What is that? What assumption?

18 A I do not think I said one should not plan.

19 Q Not in detail, you say.

20 A Planning is an ordinary part of life, and one  
21 should simply build upon the planning that one ordinarily  
22 does to that of emergencies and utilize the same material  
23 and the same resources on those situations.

24 Q I understand that. But I am saying that the plan  
25 for farmers calls for feed, water, the cattle to be watered

1 from drums. Now that is not the way cattle are generally  
2 watered. Doesn't this kind of planning that is specific  
3 perhaps to a nuclear disaster require detailed planning that  
4 may not be necessary, for instance, for an oil spill or a  
5 civilian riot?

6       A     Well, I am not sure how much detail one needs to  
7 go into. There are people in every community that are in  
8 slightly different circumstances. Not just farmers, but  
9 everybody has their own sets of problems.

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1           It seems to me that any type of county or state  
2 official cannot plan everything for every particular  
3 category. They have to leave that to a certain amount of  
4 initiative of the people who know their situation better.  
5 And so I think that that would be simply my notion, a long  
6 time ago, the idea that there was a tendency to overplan  
7 simply because the people that you are planning for know  
8 better what to do than you do, and that you have to leave a  
9 great deal to the initiative of people who are in the  
10 situations and who know them best and can operate best in  
11 them.

12          Q     Could I ask you, who knows better how to take care  
13 of a pet than their owners? Yet they were allowed to wander  
14 the streets during the TMI-2 accident.

15                 How do you -- do you feel that the public needed  
16 more information on planning for their pets during the  
17 accident?

18                 MR. ZAHLER: Objection. There is no evidence that  
19 pets wandered the street during the accident.

20                 CHAIRMAN SMITH: Is that the only basis for your  
21 objection?

22                 MR. ZAHLER: It is so -- well, Mr. Chairman, we  
23 have gone beyond all the rules for cross-examination that I  
24 know, and I guess I object to the whole line, and I have  
25 probably been sitting here too long.

1           It is not follow-on. The question is not -- is  
2 not tied to the direct testimony in any sense. The witness  
3 has indicated that he does not know the specifics of TMI.  
4 There are a million and one objections. I do not know which  
5 one to make. And I have obviously been sitting here much  
6 too long. I now object to all of them.

7           CHAIRMAN SMITH: Sustained.

8           MS. AAMODT: Could I just ask -- I have two more  
9 questions to ask.

10          BY MS. AAMODT: (Resuming)

11          Q      Mister -- doctor -- is it Dr. Dynes? Dr. Dynes or  
12 Mr. Dynes? I am sorry, is it Dr. Dynes?

13          CHAIRMAN SMITH: Yes, yes.

14          THE WITNESS: I do not care.

15          BY MS. AAMODT: (Resuming)

16          Q      Dr. Dynes, you said that you just want to know  
17 what you should do. You would like to know, for instance,  
18 that it is raining, so you can get your umbrella, rather  
19 than knowing that there is clouds coming and what the -- how  
20 the barometer is going or rising.

21          But now you are saying that the individual has to  
22 show the initiative, has to decide what he should do. I do  
23 not understand how those two reconcile. I am thinking about  
24 particularly in the case of the farmer, how does he -- how  
25 does he know what to do without being told what to do? And

1 yet you -- you say that -- that he should do what he knows  
2 he should do.

3 I am wondering how this -- how this comes about.

4 A I do not see any apparent contradiction between  
5 those two examples. I am saying that most people are the  
6 most effective judge of how to deal with their own lives.  
7 Sometimes they need help or suggestions, and my example of  
8 rain is, give me the relevant suggestions that help me to  
9 make the decisions, for me to do what I need to do.

10 Q Do you think that the public should have an  
11 education program so that they -- including day to day  
12 information, for instance, on radiation releases, so that  
13 they are prepared to judge the situation themselves and how  
14 the -- and are essentially allowed to take their own  
15 actions, what they consider appropriate?

16 A I think I said several times during my testimony  
17 that different types of levels of information are needed for  
18 different people and different purposes. I would see no  
19 great purpose in providing public information which would  
20 raise technical information about radiation, because most  
21 people do not need to know it.

22 I have gotten along well without it. What needs  
23 to be done in public information is what preventative  
24 action, in case there is a particular type of release. And  
25 this is the same thing true of a lot of threats in life.

1 There are particular types of information that we need at  
2 particular times. And we do not need to be -- have complete  
3 knowledge of everything that might affect us.

4 Q Just on the reluctance of people to evacuate, you  
5 -- there was -- I read this in your studies, that you have a  
6 percentage. Was it 35 percent, I believe, of people who  
7 will evacuate in the face of a disaster?

8 A I do not recall the citation that you are making  
9 with that particular point.

10 Q I can't remember which one it was in, but how do  
11 you -- how would you assure that farmers would -- who have  
12 their -- their livestock to care for on a daily basis, would  
13 be willing to take protective action on the basis of your  
14 assertion in your studies that a small percentage are  
15 willing to evacuate?

16 MR. ZAHLER: Objection. The examiner has  
17 indicated she does not know what the study is. The witness  
18 does not know what the study is.

19 Moreover, the question with respect to farming is  
20 beyond the scope of the witness' direct examination.

21 MS. AAMODT: I am sorry. It was in "Psychology  
22 Today" in February 1970. 35 percent stayed in their own  
23 homes. It was a major problem getting people to move.

24 THE WITNESS: That is a quotation from what study,  
25 though?

1 BY MS. AAMODT: (Resuming)

2 Q It was in - on the Texas and Louisiana coast.

3 Only 35 percent left their homes.

4 Now, the farmers have livestock to care for. You  
5 say people are reluctant -- I heard you say today -- are  
6 reluctant to take action. There is more reluctance and  
7 there is a panic.

8 But how can we assure that the farmers -- that we  
9 can overcome the farmers' objections to taking protective  
10 action, either sheltering or evacuation?

11 A Well, I think it is a more general problem than  
12 the problem of farmers. Farmers are a special class. The  
13 general problem, and part of the way to overcome the thing  
14 is, we have talked about it in terms of the perception of  
15 threat, what it might mean to the person and what types of  
16 actions they can take to prevent negative consequences. In  
17 other words, the same thing is true of farmers as any other  
18 category in the population.

19 Q You do not see the farmers' problem as being  
20 different, that they are caretakers of -

21 A Everybody has different sorts of problems. But  
22 the general process is the same.

23 Q And you do not find that 35 percent is a small  
24 number of people? You cannot tell us how we could direct  
25 any kind of a public information program or how we could

1 alert the public in a way that is different than the way  
2 they did it in Louisiana and Texas, so that we could assure  
3 that more than 35 percent would follow the instruction?

4 A As I recall those studies, you still have -- you  
5 have the problem there that you have in any place, in other  
6 words of convincing the people that evacuation was a  
7 rational preventive action. And one can look at it in two  
8 ways: From that study, that 65 percent of them did take  
9 preventive action.

10 And we would hope that a larger number could be  
11 encouraged to take that if it is communicated to them more  
12 effective.

13 Q Now --

14 CHAIRMAN SMITH: Mrs. Aamodt, you told us about  
15 four questions ago, more than that, six questions ago, that  
16 you had two questions left.

17 MS. AAMODT: I have one now, just one. It is just  
18 a follow-up to what he said here. I did not mean to really  
19 have another one.

20 BY MS. AAMODT: (Resuming)

21 Q It is this: that you say that people will follow  
22 a family pattern and so forth. I understand the  
23 Pennsylvania Farmers Association sent out a directive to  
24 farmers, and that was considered to have been a very good  
25 thing and the farmers listened to it.

1           Would the county agent be the proper person?

2   Would an agricultural agent be the proper person, do you  
3   think, to address the farmers on this?

4       A     Going back --

5           CHAIRMAN SMITH: Do you know the answer to that  
6   question?

7           THE WITNESS: I think that would be a proper  
8   forum, right. In other words, what I said earlier, use any  
9   media that you want. If that is a form of communication to  
10   that particular group, use it.

11          MS. AAMODT: I think there is a principle there  
12   involved.

13          CHAIRMAN SMITH: I just want him to answer the  
14   question, is the county agent a proper person to tell the  
15   farmer, and he answered yes.

16          THE WITNESS: In public education, that was my  
17   understanding of the term. Right?

18          BY MS. AAMODT: (Resuming)

19          Q     No. Informing him as to what protective actions  
20   to take in the time of an emergency, that he would listen to  
21   a county agent more than he would Walter Cronkite or  
22   somebody like that, who has not farmed.

23          A     I would not single it out. The county agent would  
24   be one source of information that farmers might listen to.  
25   But I would not restrict it to that.

1           Q     This is the point I wanted to make. Doesn't that  
2 -- you say he would be one form that they would listen to.  
3 Doesn't that take detailed kind of planning?

4           A     In the sense that he might have some  
5 responsibility in the emergency plan? Yes.

6           MS. AAMODT: Thank you.

7           CHAIRMAN SMITH: Now, we, because of the general  
8 nature of the testimony, we did not require lead Intervenor  
9 to stick to a cross-examination plan. We have lectured at  
10 length now the need for consolidation on these issues after  
11 this.

12               Mrs. Aamodt. I am talking to you in particular,  
13 because we have had a problem with follow-on  
14 cross-examination. After this, if you do not have  
15 significant initial cross-examination, it is going to be  
16 very difficult for us to believe that all of your  
17 examination is genuinely follow-on cross-examination. All  
18 of those questions are questions, knowing what your interest  
19 in this proceeding is, are questions I would have expected  
20 from you in your own initial cross-examination. So we have  
21 difficulty believing that you are representing to us  
22 accurately that this is genuine follow-on, these are  
23 questions that occurred to you only because they were  
24 questions asked in cross-examination.

25               Do you understand why we would have difficulty

1 believing that?

2 MS. AAMODT: I can understand how you might have  
3 difficulty. I am not doubting your honesty in saying that.

4 But I am also being very honest in saying that my  
5 questions came out of what Mr. Dynes said in his testimony  
6 today.

7 CHAIRMAN SMITH: All right.

8 MS. AAMODT: I had not really planned -- I had  
9 hoped to be here on time to object to Mr. Dynes' testimony.  
10 And I had not really thought that Mr. Dynes' testimony would  
11 be -- would carry.

12 CHAIRMAN SMITH: I just want to caution all of the  
13 parties, not just you, that where there has not been  
14 significant initial cross-examination, we will be very  
15 skeptical as to whether there has been -- the follow-on  
16 cross-examination is indeed follow-on cross-examination,  
17 that it was examination that was suggested in the first  
18 instance by the cross-examination proceeding. It is just  
19 simply not a matter of logic that a person would have  
20 extensive follow-on cross-examination, but not any initial  
21 cross-examination.

22 MS. AAMODT: It came out of a study of Mr. Dynes'  
23 articles, but it also came out of Mr. Dynes' answers.

24 CHAIRMAN SMITH: You were able to find  
25 cross-examination questions which you could pick your

1 initial cross-examination on. And I am telling you that we  
2 will be looking for that, and that is not permissible. We  
3 expect -- we expect good faith from you in this  
4 intervention.

5 MS. AAMODT: You have very good faith from me. I  
6 intended to do that today.

7 And Mr. Smith, may I also ask you that if I am to  
8 have any part in the hearing, that it seems that I -- we  
9 should as Intervenors have some time.

10 CHAIRMAN SMITH: Yes. I agreed with you when you  
11 raised that point before. There is no need to raise it  
12 again. You will have time.

13 MS. AAMODT: Thank you very much. I did not hear  
14 you.

15 MS. LOUISE BRADFORD: Mr. Smith.

16 CHAIRMAN SMITH: Who is calling me? Ms.  
17 Bradford?

18 MS. LOUISE BRADFORD: Gail Bradford's last  
19 question was actually my follow-on question, which did not  
20 get completely satisfied. And I wonder if I could rephrase  
21 that question to Dr. Dynes, the question about avoidance and  
22 the local population.

23 CHAIRMAN SMITH: All right.

24 BY MS. LOUISE BRADFORD:

25 Q Dr. Dynes, are you familiar with any studies of

1 communities who have suffered trauma? I do not know the  
2 exact citation, but I am thinking specifically of some  
3 studies done by Dr. Robert Lifton, Robert J. Lifton.

4 A Well, "trauma" is a psychological term and it is  
5 hard to answer. I have studied a number -- using my own  
6 terminology -- of crises, disaster events and so forth,  
7 sure.

8 Q Would you agree that there is a tendency in part  
9 of the community that has suffered crises or trauma,  
10 whatever the term you choose, to deny, especially -- let me  
11 rephrase that -- especially when the circumstances  
12 surrounding that crisis are of a technical nature, which is  
13 beyond the comprehension of a great portion of the  
14 community; that there is under those circumstances a  
15 tendency to deny the occurrence and have a numbing effect,  
16 if you will? Would you agree with that?

17 A This is an extremely complicated issue. You are  
18 using -- you are using certain psychological theories that I  
19 do not accept and this is partly an academic discussion.  
20 And I do not think it is pertinent to this legal -- I mean,  
21 to this court.

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1 CHAIRMAN SMITH: Well, sir, the party sponsoring  
2 you has not objected to the question, so unless you have  
3 deep-seated professional objections to giving the answer, I  
4 think you are required to do it.

5 MR. ZAHLER: Mr. Chairman, just so it is clear,  
6 the question is to deny the existence of a second  
7 emergency. Is that what we are talking about?

8 MS. LOUISE BRADFORD: That such an emergency  
9 happened, and that it could happen again.

10 MR. ZAHLER: Oh, I am going to object to that. I  
11 understood the Board's ruling that we could inquire into  
12 this area for purposes of not listening to a warning in the  
13 second emergency, but what I now understand Ms. Bradford to  
14 be saying, it is to deny the existence of the first accident  
15 and to not believe that one will ever occur again.

16 And I do think that that extends beyond the  
17 emergency planning area now.

18 CHAIRMAN SMITH: Well, do you mean to take it into  
19 believing that there is in fact a second emergency?

20 MS. LOUISE BRADFORD: Yes. It gets to the heart  
21 of what Dr. Dynes has been discussing here today. He has  
22 continually referred to a planning that is built into the  
23 family routine, and under the circumstances that a family  
24 might or members who are responsible for planning for a  
25 family might deny the fact that another accident or another

1 incident of a similar nature could occur.

2           What assurance do we have that this built-in  
3 planning system would be operable?

4           CHAIRMAN SMITH: Could occur or has occurred?

5           MS. LOUISE BRADFORD: Could occur.

6           CHAIRMAN SMITH: When it is occurring.

7           MS. LOUISE BRADFORD: Yes, when it is occurring.

8           THE WITNESS: Maybe I can answer simply. The  
9 thing I was getting at, I do not -- the psychological  
10 theory, this is more unconscious motivation and this type of  
11 thing which I do not go along with. I think some people  
12 have difficulty in coming to terms with potential threats.  
13 There is no doubt about that. But I mean, that is -- that  
14 may be a fact of life. That is one of the reasons that you  
15 have community planning, to assist people that might be  
16 reluctant -- it forces them to come to terms with the  
17 issue. And while I put -- in terms of my own testimony I  
18 placed a great deal of reliance upon in a sense local and  
19 individual initiative. I do not mean that as a displacement  
20 to community planning. And one thing community planning  
21 does is to force people to continue to think out things that  
22 they need to do as individuals, so that they cannot repress  
23 it.

24           BY MS. LOUISE BRADFORD: (Resuming)

25           Q      I understand you have not done studies, and so you

1 would not be able to tell us what portion of the population,  
2 for instance.

3 A No, and neither has Dr. Lifton.

4 Q Right. I understand that.

5 A Okay.

6 Q What I am saying is that there is a possibility  
7 that this could be a significant portion of the population.

8 A It is very difficult to get at.

9 MR. ZAHLER: Objection.

10 CHAIRMAN SMITH: We are going beyond all bounds of  
11 what this witness testified to and what the direct testimony  
12 is and what I understood the Board's rule to be with respect  
13 to permissible examination in this area.

14 (Board conferring.)

15 CHAIRMAN SMITH: Restate your question. I do not  
16 know how to rule. You'll have to restate it.

17 MS. LOUISE BRADFORD: I need to know in the  
18 circumstance that this part of the population that we have  
19 been discussing might be significant. Would Dr. Dynes care  
20 to rethink his statement that much planning should go into  
21 it, detailed planning, that that portion of the population  
22 might indeed need detailed planning?

23 CHAIRMAN SMITH: Okay. I think that is a  
24 purposeful question, if it clear enough, but I mean as far  
25 as the scope of it is concerned, I think it is permissible.

1                   MR. ZAHLER: Dr. Dynes, do you understand what the  
2 question pending is?

3                   THE WITNESS: By this time I am not really sure.

4                   BY MS. LOUISE BRADFORD: (Resuming)

5                 Q     Let me explain again, Dr. Dynes. We have  
6 discussed a portion of the population you might tend to deny  
7 at the time of a second incident that that incident was  
8 occurring and therefore not prepare adequately.

9                   I am asking in this circumstance would you rethink  
10 the notion that detailed planning was not necessary, and  
11 that indeed for this portion of the population detailed  
12 planning might be necessary?

13                  MR. ZAHLER: Objection.

14                  CHAIRMAN SMITH: Overruled.

15                  All right. State your grounds.

16                  MR. ZAHLER: The grounds were stated before, that  
17 it is beyond the permissible inquiry in this proceeding.

18                  CHAIRMAN SMITH: Overruled.

19                  THE WITNESS: Well, I am not sure that the people  
20 you are talking about are the ones that need detailed  
21 planning. You are trying -- if I understand your question,  
22 you are saying that there are some people who have  
23 difficulty in coming to terms with this. I am not sure that  
24 they necessarily need the detailed type of great details.  
25 They may need simple suggestions to evoke action. I think

1 we are crossing a couple of things.

2 People are going to have trouble coming to terms  
3 -- some people are. That is why you have community planning.

4 BY MS. LOUISE BRADFORD: (Resuming)

5 Q But part of your plan, your more simplified plan,  
6 is dependent upon personal initiative.

7 A Well, let -- I think the problem is after a long  
8 afternoon people are selecting one particular element as a  
9 key element which is not my key element. The details were  
10 one thing among eight things, and now suddenly we are  
11 focusing on that.

12 CHAIRMAN SMITH: That is the nature of cross  
13 examination.

14 THE WITNESS: I know it is. I know it is, sir.

15 (Laughter.)

16 But it is difficult for someone who has thought a  
17 great deal about this suddenly to find themselves defending  
18 one sentence they made four hours ago, because I realize the  
19 complexities of the issue, because I have thought a lot  
20 about it.

21 CHAIRMAN SMITH: Yes.

22 MS. LOUISE BRADFORD: I have no further questions.

23 CHAIRMAN SMITH: Anything further of Dr. Dynes?

24 (No response.)

25 CHAIRMAN SMITH: All right. Thank you very much,

1 sir. You are excused.

2 (The witness was excused.)

3 CHAIRMAN SMITH: We had some preliminary matters  
4 that we wanted to take up with respect to Mrs. Aamodt's  
5 motion, and inasmuch as you were late we deferred it. You  
6 have several pending motions we wanted to rule on.

7 While I am looking for my notes I am reminded of a  
8 problem. Many of the parties when we are absent from the  
9 bench just walk up and place documents, and unless they are  
10 pointed out to us, we may not be aware that they have been  
11 placed on the bench among many other documents that are  
12 already there.

13 Okay. Your first motion was a request that  
14 evidence on operator fatigue -- you want a ruling on  
15 evidence for operator fatigue with respect to training is  
16 appropriate. We rule that you have failed to demonstrate  
17 adequate evidentiary basis or possible evidentiary basis  
18 that operator fatigue had a nexus to the accident or the  
19 handling of the accident; so therefore, that request is  
20 denied.

21 You have a motion for clarification of transcript  
22 re-examinations. I believe that the transcript is very  
23 thorough on the subject. The Board believes the subject was  
24 addressed many times at the hearing, and that motion is  
25 denied.

1                   (Board conferring.)

2                   CHAIRMAN SMITH: All right. Dr. Little has raised  
3 a question about whether that really is in fact the Board's  
4 ruling, so we will have to come back to that.

5                   You have a request for subpoenas of agricultural  
6 agents in Dauphin County. Your problem is not necessarily  
7 that of subpoena.

8                   MRS. AAMODT: I could not hear you, Mr. Smith.

9                   CHAIRMAN SMITH: We do not have a sufficient  
10 demonstration of why you need those agents. Have you talked  
11 to those agents?

12                  MRS. AAMODT: I talked to one, and one of the  
13 other intervenors talked to the other.

14                  CHAIRMAN SMITH: Are you making this request on  
15 behalf of other intervenors?

16                  MRS. AAMODT: Yes.

17                  CHAIRMAN SMITH: Who is that?

18                  MRS. AAMODT: Mr. Jordan.

19                  MR. CUNNINGHAM: Mr. Smith. Let me see, I talked  
20 on the 23rd of March to agricultural agent, Mr. John Smith,  
21 York County in aid of intervenors generally under the  
22 agreement that we had reached. Mr. Smith had indicated to  
23 me that various facts, which I do not know whether Mrs.  
24 Aamodt placed in her motion with the Board, that would  
25 indicate that he had not had input into the county emergency

1 plan. And furthermore, he was not aware of what his  
2 responsibility was under the plan.

3 CHAIRMAN SMITH: This is what you want to  
4 establish from both?

5 MR. CUNNINGHAM: I believe that may be what Mrs.  
6 Aamodt wants to establish, yes.

7 MRS. AAMODT: That and more. Whether these  
8 farmers in their opinion, in their expert opinion, since the  
9 farmers may be considered their expertise to their own  
10 situation, that they cannot speak for all the farmers, that  
11 the county agent, therefore, would be the expert who would  
12 know farm situations in general and be able to give us an  
13 idea as to whether these plans were adequate or not.

14 CHAIRMAN SMITH: Neither of these gentlemen will  
15 voluntarily cooperate with you and come to the hearing?

16 MRS. AAMODT: They would cooperate, but they would  
17 rather be subpoenaed than to become my witness.

18 (Board conferring.)

19 CHAIRMAN SMITH: Well, you see, the issue before  
20 the Board is not whether the agents, if subpoenaed, meet the  
21 other rulings that we have made throughout the hearing, and  
22 that is notice of what they are going to say. Obviously, if  
23 they want to appear without a subpoena, they are not going  
24 to provide you with written prefiled testimony, I would  
25 expect.

1                   Do you know, are these county agents federal  
2 employees?

3                   MRS. AAMODT: They are a combination, combination  
4 local, state, federal. Their offices are provided locally.

5 There is some state contribution. There is some federal.

6                   CHAIRMAN SMITH: Do you know --

7                   MRS. AAMODT: They are appointed by the state  
8 university.

9                   CHAIRMAN SMITH: All right. We have --

10                  MRS. AAMODT: Initially and approved by local  
11 boards. It is intertwining.

12                  CHAIRMAN SMITH: Who pays them?

13                  MRS. AAMODT: What is that?

14                  CHAIRMAN SMITH: Who pays them?

15                  MRS. AAMODT: I did not ask.

16                  MR. STRAUBE: Chairman Smith, I do not know for a  
17 fact, but I was told by one of the gentlemen in the  
18 Pennsylvania Department of Agriculture that they are federal  
19 employees by the U.S. Department of Agriculture.

20                  CHAIRMAN SMITH: If they are federal employees, it  
21 is no problem. We can simply issue a subpoena to them. If  
22 they are not federal employees, unless the Board adopts them  
23 as our witnesses, you will have to tender travel expenses  
24 and witness fees. But if they are federal employees, we  
25 will issue the subpoena and there is no problem. They just

1 come as a part of their job. But there is also a problem,  
2 they may resist the subpoenas, but we can worry about that  
3 later.

4 But we will issue subpoenas. Will you serve them?

5 MRS. AAMODT: We can handle that.

6 CHAIRMAN SMITH: You are going to have to work out  
7 a time for their appearance with the parties, and could you  
8 come back to us tomorrow on that? And you are going to have  
9 to -- are the parties satisfied that you have enough notice  
10 as to what their testimony is going to be?

11 MR. ZAHLER: I was going to inquire, Mr. Smith. I  
12 understand Mr. Cunningham's statement that they would  
13 testify as to -- that they had had no input into the county  
14 emergency plans, and they were unaware of their  
15 responsibilities. And then Mrs. Aamodt said and something  
16 more, and it was not clear to me what the bounds of that  
17 "and something more" was.

18 CHAIRMAN SMITH: Everyone is entitled to have full  
19 notice of what the nature of their testimony is. So would  
20 you instead of taking your time about it, why don't you  
21 write that out in as much detail as you can?

22 MRS. AAMODT: There is nothing detailed. It is  
23 just simply the adequacy of the plan, the adequacy of the  
24 plan for the care and/or evacuation of livestock. And  
25 perhaps Mr. Jordan has something more that he would like to

1 question them on, or Ms. Bradford, but that is all I plan to  
2 question them on.

3 CHAIRMAN SMITH: You know what they told you about  
4 the adequacy of the plan.

5 MRS. AAMODT: I did not ask them about the  
6 adequacy.

7 CHAIRMAN SMITH: You do not know what they are  
8 going to testify to?

9 MRS. AAMODT: I have no idea.

10 CHAIRMAN SMITH: That is the problem there. See,  
11 this is not -- you do not issue subpoenas to bring people to  
12 the hearing for discovery purposes. You issue a subpoena at  
13 this stage of the proceeding to bring them here to testify  
14 on a subject matter that you know they are going to testify  
15 on. It is very late in the proceeding for discovery.

16 Now, Mr. Cunningham can report to you or Ms.  
17 Bradford can report to you that we did in fact issue a  
18 subpoena for Mr. Curry during the discovery process, but you  
19 cannot ask us to subpoena a person here when you do not know  
20 when they are going to testify to.

21 MRS. AAMODT: The --

22 CHAIRMAN SMITH: We know what the Dauphin County  
23 agent is going to testify to. If you want him there for  
24 that purpose, we will issue the subpoena.

25 MRS. AAMODT: The --

1 CHAIRMAN SMITH: For that limited purpose, but you  
2 just cannot bring him here and start firing questions at him.

3 MRS. AAMODT: We simply want to establish that  
4 they have a part in this emergency plan, and that they do not  
5 know about it, and what they -- how they --

6 CHAIRMAN SMITH: Did they already tell you that  
7 they know nothing about the plan?

8 MRS. AAMODT: That is right.

9 CHAIRMAN SMITH: That aspect of it, then we will  
10 enforce the subpoena.

11 MRS. AAMODT: What is that?

12 CHAIRMAN SMITH: For that purpose we will enforce  
13 the subpoena. We will issue a subpoena. But you should be  
14 aware that when they come here, then you cannot begin asking  
15 them questions for general discovery purposes. You will  
16 have to ask them questions that you know the answers to.

17 MRS. AAMODT: All right. I will talk it over with  
18 the other intervenors. I am limited in my legal knowledge.  
19 I have not had even one hour --

20 CHAIRMAN SMITH: I know. You have explained that  
21 to us.

22 MRS. AAMODT: And I think it is enough just to  
23 intervene in substance without trying to pretend to be a  
24 lawyer, so I will --

25 CHAIRMAN SMITH: All right. We are not suggesting

1 that you are pretending to be a lawyer, but I think we have  
2 explained to you before. You know what discovery is. You  
3 know what the purpose was. You have had many discovery  
4 motions and disputes and explanations, but nevertheless, no  
5 harm done. You understand now.

6 MRS. AAMODT: The emergency plan for farmers was  
7 changed somewhat again, and it's just been sent to us. You  
8 know, we just had testimony from the -- just had plans  
9 essentially issued. Are you aware of that, Mr. Smith?

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1 CHAIRMAN SMITH: No, ma'am. But I know we are not  
2 going to allow you to use the subpoena at this stage of the  
3 proceeding for initial discovery. That is what you are  
4 undertaking to do in the areas where you do not know the  
5 answers.

6 MS. AAMODT: I will confer with the others and we  
7 will understand your directives as you have given them, Mr.  
8 Smith.

9 Could I also ask that, in the event you rule  
10 against a clarification of the transcript on the exam  
11 results that -- that I am provided with some summary that  
12 perhaps the Board understands, which I do not understand, to  
13 identify -- I cannot make it out. I have read the  
14 transcript and --

15 CHAIRMAN SMITH: Part of the difficulty is I have  
16 a lot of trouble understanding your request, too.

17 MS. AAMODT: Could I clarify that?

18 CHAIRMAN SMITH: I do not have it now. We will  
19 just have to go back and look at it again.

20 Dr. Little pointed out to me that the Board is not  
21 in agreement with what I stated. I have made a mistake.  
22 But we will look at it again.

23 MS. AAMODT: Could I just ask one other thing, Mr.  
24 Chairman. I am sorry.

25 (Board conferring.)

1 CHAIRMAN SMITH: We will take that up later. We  
2 will look at it and see if there is a void. I think I just  
3 simply made a mistake in my consultation.

4 MS. AAMODT: Mr. Smith, I spent many, many hours  
5 researching that document that I sent to you on fatigue.  
6 And I am going to request, if it is possible -- I hope it is  
7 not considered impertinent, but I would very much like to  
8 have the reasons in writing.

9 CHAIRMAN SMITH: The reasons -- the reason is, you  
10 say -- you were given an opportunity to demonstrate that  
11 there was evidence of record or evidence that could be made  
12 evidence of record that operator fatigue has a nexus to the  
13 accident and the handling of the accident. And you give us  
14 many, many pages, 14 pages, as I recall.

15 After reading those 14 pages, I cannot find any  
16 such evidence. So I cannot really explain a negative. I  
17 cannot tell you -- I cannot -- it is hard to explain a  
18 void. It is just not there. I just cannot find it.

19 MS. AAMODT: You did not accept my explanation as  
20 being --

21 CHAIRMAN SMITH: No, no, that is right. The Board  
22 did not accept your explanation that mind set was equivalent  
23 to fatigue.

24 MS. AAMODT: Has a fatigue effect.

25 CHAIRMAN SMITH: Yes.

1 MS. AAMODT: But the -- Mr. Smith, you also  
2 requested of me that I show nexus to the Commission's order,  
3 also, and that I also, you know, to -- does this mean that  
4 everything is struck in my testimony or cannot be used in  
5 findings, or what?

6 CHAIRMAN SMITH: The portion of the testimony  
7 relating to fatigue, I think that the motion to strike, it  
8 is still pending -- I do not know by memory now. I do not  
9 know how that arose. There is a motion to strike the  
10 section of your testimony on operator fatigue as it relates  
11 to training. But you were given an opportunity to show  
12 nexus of that testimony to the accident.

13 You have failed to do it and the motion is  
14 granted.

15 MS. AAMODT: Could I also understand in writing,  
16 Mr. Smith, how that does not have anything to do with 0694,  
17 TMI-2-related events, which was the NRC's argument?

18 CHAIRMAN SMITH: The difficulty is, it is  
19 virtually impossible for me to write something to explain  
20 how something is not related. I can explain how something  
21 is related quite easily, but how something is not related  
22 would require, for example, postulation of all possible ways  
23 why it could be related and then addressing each one of  
24 them.

25 You have failed in your burden of establishing it

1 is related.

2 MS. AAMODT: I just ask on that particular thing  
3 how it would be included in a TMI-2-related document and not  
4 be related to TMI-2.

5 CHAIRMAN SMITH: I found nothing in any of the  
6 documents that you referred to which supported your  
7 statement.

8 MS. AAMODT: I meant 0694, Mr. Smith. Not all the  
9 documents, NRC's argument, which Mr. Swanson's argument was,  
10 that he would not have trouble relating it to the contention  
11 because -- to the accident because it was within the TMI-2  
12 document.

13 CHAIRMAN SMITH: Mr. Swanson is not making the  
14 ruling.

15 MS. AAMODT: What is that?

16 CHAIRMAN SMITH: The Board is making the ruling,  
17 not Mr. Swanson. We are not bound by his --

18 MS. AAMODT: I had used that argument and I just  
19 wondered.

20 CHAIRMAN SMITH: You just lost it.

21 All right, that is the Board's ruling. All right,  
22 is there anything further? Oh, yes.

23 MS. LOUISE BRADFORD: Chairman Smith?

24 CHAIRMAN SMITH: Yes, Ms. Bradford?

25 MS. LOUISE BRADFORD: Could we bring up the matter

1 of proposed findings?

2 CHAIRMAN SMITH: I pointed out to Ms. Bradford  
3 during her absence the Licensee and the staff have  
4 represented to the Board that proposed findings on  
5 management issues could not be filed until May 15. And I  
6 told her if she wanted to have input into that consideration  
7 she should raise it.

8 And apparently you do.

9 MS. LOUISE BRADFORD: Yes, I do.

10 CHAIRMAN SMITH: Am I correct that was May 15, and  
11 a reply on June 15?

12 MR. TROWBRIDGE: That is correct, yes.

13 MS. LOUISE BRADFORD: So that, do I understand  
14 that we have to have our filing in by May 15 or Licensee  
15 will have their filing in by May 15?

16 CHAIRMAN SMITH: Your initial proposed findings on  
17 management issues, under that recommendation, would be filed  
18 on May 15. Reply findings, that is findings responding to  
19 those initial proposed findings, would be due on June 15.

20 MS. LOUISE BRADFORD: So those are -- those are  
21 our findings that would be due by June 15?

22 CHAIRMAN SMITH: No. The way we are approaching  
23 it, all parties submit the findings that they want the Board  
24 to find, the proposed findings, on the first date mentioned,  
25 which in this instance is May 15. And then all parties may,

1 if they wish, file replies to those findings, and that is  
2 file replies and reply findings.

3 Let's say that you propose -- Licensee proposes a  
4 finding that you had not thought about in your initial, and  
5 you want to point to evidence which replies to the findings  
6 that the Licensee has made. Why, then you have that  
7 opportunity.

8 But the second opportunity is limited to  
9 responding to the initial round of proposed findings.

10 MS. LOUISE BRADFORD: I understand. And I went  
11 back and I looked at 10 CFR rules.

12 CHAIRMAN SMITH: That is not in accord with the  
13 regulation.

14 MS. LOUISE BRADFORD: That is right.

15 CHAIRMAN SMITH: We are aware of that. However,  
16 we have the authority to change those time sequences, and in  
17 this case we have indicated we believe that is a good  
18 practice in this case. There are balances.

19 If you will read the rule, you will see that the  
20 Licensee has the opportunity to file the last round of  
21 findings. They are giving up that right, and we believe  
22 that the spirit of the rules is being complied with by one  
23 round of initial findings and one round of proposed  
24 findings.

25 But you are entirely correct, that is not the time

1 period provided for in the rules.

2 MS. LOUISE BRADFORD: The reason I pointed that  
3 out is because I -- I was asking for extra time, or I  
4 intended to ask for extra time, mostly because we are having  
5 problems. As you know, the Intervenors do not have access  
6 to transcripts. The problem arises in that the transcripts  
7 that are available in the document room are generally three  
8 to four weeks. There is a time lag there.

9 CHAIRMAN SMITH: Yes, okay. I am glad you -- Ms.  
10 Weiss brought that up yesterday, and we had not been aware  
11 of that. And today we have begun an effort to get those,  
12 and we are going to follow up on that and make sure that  
13 those findings are in there, very, very short lag.

14 So we are -- so the ruling we make on the schedule  
15 for proposed findings will take that into account. However,  
16 management issues have been closed for some time now, and  
17 that problem I do not see is going to affect you.

18 MS. LOUISE BRADFORD: I understand that.

19 The other problem is that the document room is not  
20 always available. For instance, the public library is not  
21 open on Sunday, when many people have that day available.

22 CHAIRMAN SMITH: Even as it is, Ms. Bradford, we  
23 are providing more time for the filing -- if we accept that  
24 recommendation, we are providing more time for the filing of  
25 proposed findings after the close of the record on that

1 issue than the rules provide for.

2                 The desirability of using proposed findings in our  
3 proceedings was pointed out by this Board to the Commission,  
4 how important it was. And our Commissioners pointed out to  
5 the House Appropriations Committee that proposed findings  
6 are very desirable -- I mean, transcripts are very desirable  
7 in the use of proposed findings.

8                 But nevertheless, the law that the Commission must  
9 comply with is that Intervenors do not get transcripts. And  
10 that was taken into account when the time schedules in the  
11 rule were set out. I don't think that is going to be a  
12 basis for changing it.

13                 We will try to assure that the transcripts are in  
14 the public document room. There are two of them, of  
15 course.

16                 MS. LOUISE BRADFORD: You are saying there are two  
17 sets of transcripts or public document rooms?

18                 CHAIRMAN SMITH: One in York and one here.  
19 Moreover, as you know, there is a library of transcripts in  
20 the hearing room that, if you want to work here on the  
21 findings, well, you certainly can use those that the Board  
22 -- any time the Board is not using them. And this I believe  
23 is -- is very desirable for the Board's purpose in getting  
24 accurate and detailed proposed findings.

25                 MS. LOUISE BRADFORD: I appreciate that.

1 CHAIRMAN SMITH: Ms. Bradford, we have not ruled,  
2 however, but it seems to me that May 15th is a reasonable  
3 time for filing proposed findings.

4 Ms. Bradford?

5 MS. GAIL BRADFORD: Some time ago, Ellen Weiss  
6 said she would supply a sample proposed finding.

7 CHAIRMAN SMITH: She did.

8 MS. GAIL BRADFORD: I never saw it. I heard about  
9 it from Steve Sholly, but I did not ever see it. I was  
10 wondering when it was served.

11 CHAIRMAN SMITH: Ms. Louise Bradford indicated she  
12 received it.

13 MS. LOUISE BRADFORD: She sent it.

14 CHAIRMAN SMITH: We did not receive it, so we  
15 cannot help you on it. We just received a cover letter that  
16 she had done that.

17 Anything further?

18 MR. TROWBRIDGE: Mr. Chairman, I hope the Board  
19 will soon issue a definite ruling on the findings schedule.

20 CHAIRMAN SMITH: Yes. As soon as we adjourn, we  
21 will take it up and see if the Board believes that that is a  
22 reasonable schedule.

23 MR. TROWBRIDGE: All right.

24 (Board conferring.)

25 CHAIRMAN SMITH: I see we had another matter. The

1 witnesses to defend the evacuation time study are apparently  
2 .e and ready to testify. And we are wondering if it might  
3 not be a better approach to have their testimony after the  
4 staff has reviewed the aiequact of the report.

5               If you have already planned for it and there will  
6 be a void, we'll go ahead. But it seems to me in the long  
7 run it might be more efficient if you could readjust the  
8 schedule, not at the expense of a void.

9               MR. ZAHLER: Maybe the parties should talk among  
10 themselves. The reason why they are here is there was  
11 nothing else to put in the schedule, and we planned to have  
12 them some time next week, in fact. But it is understanding  
13 that the PEMA witnesses are ready to start as of Monday, and  
14 therefore there is a staff witness.

15              Mr. Levine has been waiting, I think, for a couple  
16 of days. But I do not know how much cross-examination he is  
17 going to take.

18              MR. GRAY: And Mr. Donaldson also will be  
19 available tomorrow.

20              MR. ZAHLER: I just do not see us taking up all of  
21 tomorrow and Saturday with Mr. Levine and Mr. Donaldson, is  
22 the problem. And there was no one else to go.

23              CHAIRMAN SMITH: We would not want that changed at  
24 the expense of a void. I mean, it would just -- it would be  
25 somewhat more efficient, but it would not be as efficient --

1 a void would be the least efficient.

2 MS. STRAUBE: Chairman Smith.

3 CHAIRMAN SMITH: Yes, ma'am.

4 MS. STRAUBE: If we are going to do the evacuation  
5 time study before FEMA has brought out its findings --  
6 excuse me, the staff has made its review, would there be an  
7 opportunity to have additional cross-examination, if  
8 necessary after that comes out?

9 CHAIRMAN SMITH: That opportunity is always open  
10 upon a showing of need or surprise, either additional  
11 cross-examination or some other form of confrontation and  
12 testing.

13 MS. STRAUBE: Okay. Thank you.

14 CHAIRMAN SMITH: I do not think we should rule  
15 outside the context of a particular problem that that right  
16 is a certain one.

17 Anything further this evening?

18 (No response.)

19 (Board conferring.)

20 DR. LITTLE: The problem the Board -- the  
21 confusion with the Board regarding the examination grades --  
22 and I know, Mr. Zahler, you are not the cognizant counsel,  
23 so that is why the message needs to be transmitted -- is  
24 whether or not the Licensee has submitted its last, be and  
25 final listing of how those grades were distributed.

1                   MR. TROWBRIDGE: I did not quite understand you.

2                   DR. LITTLE: There have been, over the course of  
3 the hearings related to training of operators, there have  
4 been various and sundry arrangements of the grades, which  
5 lead to some confusion if you try to match up the numbers.

6 And I know, what is it, 16,490 -- what is the page  
7 number?

8                   16,467, Mr. Blake came in with a changed number.  
9 And I want to know if that is the last change and we now  
10 have the last, best and final representation of what the  
11 grades were and how they were distributed among licensed  
12 versus nonlicensed.

13                  MR. TROWBRIDGE: We will transmit this to -- this  
14 question to Mr. Blake, along with the transcript page from  
15 this afternoon.

16                  But shall I also be communicating to them that it  
17 is the Board's feeling that there is now -- there remains  
18 confusion which ought to be cleared up?

19                  DR. LITTLE: Well, we do not know. We are  
20 confused enough to not know whether we have the final  
21 numbers or not.

22                  CHAIRMAN SMITH: There are varying degrees of  
23 confusion among the different Board members.

24                  MR. TROWBRIDGE: There may at least be confusion,  
25 then, as to whether -- the numbers are confusing as they now

1 stand.

2 CHAIRMAN SMITH: All right.

3 DR. LITTLE: There are unambiguous ways of  
4 presenting this in a table. I think there must be.

5 MR. TROWBRIDGE: All right.

6 CHAIRMAN SMITH: Ms. Bradford.

7 MS. GAIL BRADFORD: I have been conferring with  
8 Mrs. Nelson from the League of Women Voters in York County.  
9 The League is -- is now willing, which is a change, to  
10 appear as witnesses and present testimony as to the method  
11 and the results of their study of the York County evacuation  
12 plan. And we would like to sponsor the League of Women  
13 Voters panel as our witness.

14 It seems from conversations with Mrs. Nelson that  
15 Saturday, April 13, would be a possible date, although it  
16 would be difficult to get the testimony in shape before  
17 then. But Saturday would be an especially good day for the  
18 League of Women Voters, and that we could have the testimony  
19 printed up and distributed at least by Wednesday the week --  
20 a few days before April 18.

21 CHAIRMAN SMITH: We do not have hearings scheduled  
22 for the 18th.

23 MS. GAIL BRADFORD: I understand, sir. This would  
24 be a request to hold a hearing on that Saturday.

25 I would also request that you not hold hearings

1 every day this week.

2 DR. LITTLE: I will tell you the problem. Because  
3 there was an empty day on the Monday following that, I am  
4 going to another hearing which is some distance from here.  
5 So there is no way I could be here on Saturday and there on  
6 Monday.

7 MS. GAIL BRADFORD: I guess I will have to find  
8 out another day to do this. But is it all right if we  
9 proceed? Does the Board or parties have objection with us  
10 proceeding with the late testimony?

11 CHAIRMAN SMITH: If they are able to respond  
12 otherwise, we will give them an opportunity to consider your  
13 request and make a response.

14 MR. ZAHLER: I have not had a chance to review the  
15 League of Women Voters study, so I'm not in a position to  
16 respond at this time.

17 CHAIRMAN SMITH: Okay. In addition, there may  
18 have to be some counciling. I am sure you will raise it,  
19 but there may have to be some counciling among the Board as  
20 to the nature of the backup data that your witness would  
21 bring with her.

22 MS. GAIL BRADFORD: I do not understand what you  
23 said.

24 CHAIRMAN SMITH: Well, since they are going to be  
25 presenting the results of polls and tabulations -- I have

1 not read it, either. I just saw that there are tables there  
2 -- that they are going to have to be prepared to not only --  
3 they are going to have to be prepared to defend the  
4 figures.

5 MS. GAIL BRADFORD: Yes, sir.

6 CHAIRMAN SMITH: And make opportunity for the  
7 figures to be tested if the adverse parties request it. It  
8 is going to require cooperation.

9 MS. GAIL BRADFORD: Yes, sir.

10 CHAIRMAN SMITH: There are many ways that can be  
11 worked out. I was going to point out, it is not simply  
12 going to be a matter of coming in and saying, this is my  
13 testimony and putting it down. It is conclusionary, summary  
14 testimony and the bases for it have to be addressed.

15 But we will worry about that when the time comes.

16 MR. ZAHLER: Mr. Chairman, I have just been  
17 informed that I do not believe Licensee has a copy of the  
18 study.

19 CHAIRMAN SMITH: Okay. I have --

20 MR. GRAY: Nor does the staff.

21 CHAIRMAN SMITH: Okay. She passed -- she passed  
22 it out, but she passed out one to every -- every person.  
23 Baxter and Tourtellotte are the culprits. They have --  
24 okay, she didn't?

25 Okay, we have copies. How many copies do you

1 have? Did you get a copy, Ms. Straube?

2 MS. STRAUBE: Yes, I believe I do have a copy.

3 CHAIEMAN SMITH: All right. We have enough copies  
4 that we can give one to each of the other parties.

5 Anything further this evening?

6 MS. GAIL BRADFORD: Yes, sir. I feel I may have  
7 done something that might prejudice the Licensee's rights  
8 and I wish you would consider whether or not I have. In my  
9 cross-examination plan, as you know, I submitted an outline  
10 of my objections to Dr. Dynes and to -- also to Ms.  
11 Levenson's testimony.

12 And since we have not discussed that today, I  
13 essentially made a private communication to you, I guess, on  
14 what my objections are going to be to Mr. Levenson's  
15 testimony. And I was wondering how you think I should  
16 handle that.

17 CHAIEMAN SMITH: As it turned out, with respect to  
18 Dr. Dynes you read it into the record and so it is no longer  
19 a private communication. I would assume you will do the  
20 same thing with the next witness. So the problem goes away  
21 when you make your objection.

22 But I thought about that problem, too. So we just  
23 put it among the cross-examination plans for service at the  
24 end of the hearing. So there is no problem.

25 But it is very considerate of you to -- very

1 considerate and responsible for you to raise it. But I see  
2 no problem there.

3 MS. GAIL BRADFORD: Thank you.

4 Have we identified a schedule of what is up next?

5 CHAIRMAN SMITH: Wait a minute.

6 If you have no objections, you might as well just  
7 pass out those objections. But if you prefer not to, you  
8 don't have to.

9 MS. GAIL BRADFORD: I do not mind passing it out.

10 My typin is atrocious, but I guess people know that by now.

11 CHAIRMAN SMITH: You are not judged by your  
12 typing, Ms. Bradford, in this proceeding.

13 Do you have any other business?

14 MS. GAIL BRADFORD: I was just wondering what the  
15 schedule is.

16 CHAIRMAN SMITH: The schedule is 9:00 a.m. -- oh.

17 MS. GAIL BRADFORD: Who?

18 CHAIRMAN SMITH: Didn't you get a copy of that,  
19 the proposed schedule?

20 Levine, Donaldson, evacuation time report  
21 witnesses, and Peterson.

22 MS. GAIL BRADFORD: I am currently expecting Dr.  
23 Beyea.

24 CHAIRMAN SMITH: That is the other item. Dr.  
25 Johnsrud called earlier this week and stated that the only

1 time that Dr. Beyea can appear is --

2 MS. GAIL BRADFORD: No, no, no. You have the  
3 wrong one.

4 CHAIRMAN SMITH: All right, the wrong one.  
5 Molholt, okay.

6 All right. How about Dr. Beyea?

7 MS. GAIL BRADFORD: Dr. Beyea can be here on April  
8 9 and is expecting to be here on April 9. Is that  
9 agreeable?

10 CHAIRMAN SMITH: Has this been communicated to the  
11 other parties?

12 MS. GAIL BRADFORD: It is on this sheet that was  
13 distributed. It says he can only appear on Thursday, April  
14 9. Does this mean that we will expect to hear him on that  
15 day?

16 CHAIRMAN SMITH: Is that agreeable to the  
17 parties? Are there any objections to that?

18 MR. ZAHLER: Mr. Smith, I am a little lost. I am  
19 not sure what the schedule is that has been handed out. We  
20 have discussed schedule a number of times. We have  
21 discussed with Ms. Bradford Dr. Beyea appearing on the 9th.  
22 Part of the discussion took place prior to the time that we  
23 realized the hearing was going to start this early and PEMA  
24 was going to appear on the 8th.

25 My preference would be if we could run through the

1 PEMA witnesses. I don't know if we could finish them by the  
2 9th or not. May I suggest that we look at the written  
3 schedule and we'll get back to the Board the first thing  
4 tomorrow morning?

5 CHAIRMAN SMITH: Okay. In deciding whether you  
6 are going to object or not, we have regularly made  
7 particular arrangements for persons who have a hard time  
8 appearing, including -- Mr. Lee comes to mind.

9 MR. ZAHLER: I have no plans for objecting. I  
10 just wanted to see what the schedule looked like before I  
11 agreed to it.

12 CHAIRMAN SMITH: I should raise up the other one,  
13 and that is Dr. Johnsrud has made the same statement, that  
14 Dr. Molholt can appear on the 10th. Am I wrong on this?

15 MS. GAIL BRADFORD: I do not believe -- well, from  
16 a recent conversation I had with Dr. Johnsrud, it is Mr.  
17 Levenson who can appear on the 10th.

18 MR. ZAHLER: Well, I do not know about Dr.  
19 Molholt. This is the first I heard about the 10th. Part of  
20 the matter I am going to discuss with you, Dr. Beyea and Mr.  
21 Levenson, is that it is not clear to me that we can do both  
22 of them on the 9th and the 10th. Therefore, that might  
23 require some rescheduling.

24 I do not have any information about whether --  
25 assume the Chairman's statement is correct, that Ms.

1 Johnstud -- that Dr. Johnsruud indicated Molholt is only  
2 available on the 10th. That is news to me.

3 CHAIRMAN SMITH: All right. That was the message  
4 from Dr. Johnsruud, that Dr. Seyea and she will be -- Dr.  
5 Molholt and she will be here on the 10th, ready to present  
6 his testimony. That was the conversation with Ms. Moran.  
7 She did not ask if any other date was available, if that was  
8 the only date he could make it. She just simply took the  
9 message. So we will have to inquire further about that, if  
10 there is a conflict.

11 MS. STRAUBE: Okay. If I could just make a  
12 statement. Mr. Zahler -- I am not sure if Mr. Levenson has  
13 to appear on the 9th or the 10th. We obviously have no  
14 objection, if somebody can only appear on a certain day, to  
15 interrupting our witnesses for that other witness. But I  
16 would rather put all the PEMTA witnesses on, you know, in a  
17 row, without interrupting them, unless it is absolutely  
18 necessary.

19 CHAIRMAN SMITH: I am sure you would. But we  
20 tried to accomplish that, but frequently we have had to make  
21 interruptions.

22 (Board conferring.)

23 DR. LITTLE: I did have one other question. I  
24 imparted yesterday that we felt we needed more adequate  
25 resumes on Mr. Lothrop, Mr. Lamison and General Smith.

1 MS. STRAUBE: They are being Xeroxed right now and  
2 should be ready tomorrow.

3 CHAIRMAN SMITH: Anything further?

4 (No response.)

5 CHAIRMAN SMITH: Okay. We will adjourn until  
6 tomorrow at 9:00.

7 (Whereupon, at 6:02 p.m., the hearing was  
8 adjourned, to reconvene at 9:00 a.m. on Friday, April 3,  
9 1981.)

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NUCLEAR REGULATORY COMMISSION

This is to certify that the attached proceedings before the

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in the matter of: METROPOLITAN EDISON COMPANY(TMI UNIT 1)

Date of Proceeding: April 2, 1981

Docket Number: 50-289 (Restart)

Place of Proceeding: Harrisburg, Pa.

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

---

David S. Parker

Official Reporter (Typed)



(SIGNATURE OF REPORTER)