

OFFICIAL TRANSCRIPT OF PROCEEDINGS

**Agency:** Nuclear Regulatory Commission  
Advisory Committee on Reactor Safeguards

**Title:** 406th ACRS Meeting

**Docket No.**

**LOCATION:** Bethesda, Maryland

**DATE:** Thursday, February 10, 1994 **PAGES:** 1 - 155

ACRS Office Copy - Retain  
for the Life of the Committee

**ANN RILEY & ASSOCIATES, LTD.**

1612 K St., N.W., Suite 300  
Washington, D.C. 20006  
(202) 293-3950

ORIGINAL **ACRST-1998**

**OFFICIAL TRANSCRIPT OF PROCEEDINGS**

**Agency:** Nuclear Regulatory Commission  
Advisory Committee on Reactor Safeguards

**Title:** 406th ACRS Meeting

**Docket No.**

**LOCATION:** Bethesda, Maryland

**DATE:** Thursday, February 10, 1994 **PAGES:** 1 - 155

ACRS Office Copy - Retain  
for the Life of the Committee

**ANN RILEY & ASSOCIATES, LTD.**

1613 K St., N.W., Suite 300  
Washington, D.C. 20006  
(202) 293-3950

9402220107 940210  
PDR ACRS  
T-1998 PDR

PUBLIC NOTICE BY THE  
UNITED STATES NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

DATE: February 10, 1994

The contents of this transcript of the proceedings of the United States Nuclear Regulatory Commission's Advisory Committee on Reactor Safeguards, (date) February 10, 1994, as Reported herein, are a record of the discussions recorded at the meeting held on the above date.

This transcript has not been reviewed, corrected or edited, and it may contain inaccuracies.

**ANN RILEY & ASSOCIATES, Ltd.**

Court Reporters

1612 K. Street, N.W., Suite 300

Washington, D. C. 20006

(202) 293-3950

180077

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

UNITED STATES  
NUCLEAR REGULATORY COMMISSION

\*\*\*

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

\*\*\*

406TH ACRS MEETING

Nuclear Regulatory Commission  
7920 Norfolk Avenue  
Room P-110  
Bethesda, Maryland  
Thursday, February 10, 1994

The Committee met, pursuant to notice, before E.  
Wilkins, Chairman, at 12:45 p.m.

## 1 PARTICIPANTS:

2

3

E. Wilkins, ACRS Chairman

4

J. Carroll, ACRS Member

5

W. Shack, ACRS Member

6

T. Kress, ACRS Member

7

H. Lewis, ACRS Member

8

C. Michelson, ACRS Member

9

W. Lindblad, ACRS Member

10

R. Seale, ACRS Member

11

I. Catton, ACRS Member

12

P. Davis, ACRS Member

13

F. Congel, NRC/DRSS

14

T. Essig, NRC/DRSS

15

J. Lee, NRC/DRSS

16

B. Whitesel, NUMARC

17

18

19

20

21

22

23

24

25

ANN RILEY & ASSOCIATES, LTD.  
Court Reporters  
1612 K Street, N.W., Suite 300  
Washington, D C. 20006  
(202) 293-3950

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

[12:45 p.m.]

1  
2  
3 MR. WILKINS: Let's reconvene the meeting. The  
4 agenda item now is the discussion of the advanced light  
5 water reactor policy issue related to the source term. I  
6 will turn the meeting over to Tom Kress, who is Chairman of  
7 our Severe Accident Subcommittee.

8 MR. KRESS: Thank you, Mr. Chairman. As all of  
9 you know, I'm sure, the NRC is reevaluating their source  
10 terms that they use for design basis consideration for  
11 containment and other issues. They issued a NUREG draft  
12 report for comment on what their proposal is for the new  
13 source terms. I guess they put this out for public comment  
14 and got comments back.

15 They're going to make a presentation. We've heard  
16 presentations on this in the past. I had given a little bit  
17 of guidance and asked a few questions and the staff has had  
18 some competing things on their time. So I think today we're  
19 going to hear more of just an overview, just to get us  
20 acquainted with what the new source terms are and the basis  
21 behind them. Later on we will have another meeting and get  
22 into the more technical details and maybe even some of the  
23 risk implications of it.

24 MR. WILKINS: Tom, I'm correct, then, when I infer  
25 that we will not prepare a letter as a result of today's

1 discussion.

2 MR. KRESS: That is my opinion.

3 MR. WILKINS: We will prepare a letter as a result  
4 of next month's meeting.

5 MR. KRESS: That's my opinion. The staff is  
6 ready.

7 MR. CONGEL: Good afternoon. My name is Frank  
8 Congel and I'm going to give just a quick introduction to  
9 the staff and we will proceed with our briefing for this  
10 afternoon.

11 A couple of the high points were already mentioned  
12 by Dr. Kress. What I wanted to emphasize during my couple  
13 of minutes up here was the scope of the briefing and our  
14 plan for having a second session.

15 What we're going to do today is give an overview,  
16 as was already mentioned, and touch upon both the technical  
17 and the policy issues. We're also going to talk about the  
18 general approach to the application of the source term  
19 parameters as we've been using them and as we've been  
20 studying them.

21 During, hopefully, next month or whenever we're  
22 scheduled in, we'll go into a more detailed discussion of  
23 the issues, and it is at the time we would answer, to begin  
24 our talk, the questions that were sent to us last month. I  
25 presume that there may be more detailed technical questions

1 presented by then, but our intent is to cover that level of  
2 detail in our second round.

3 Just quickly, you have been briefed probably a  
4 substantial number of times on the source term and source  
5 term issues. The TID source term that has been in use for  
6 many years is the TID-14844 that we're all probably more  
7 familiar with than we want to be.

8 It is used in conjunction with two regulatory  
9 guides that were finally developed in 1974. These guides,  
10 as a reminder, pretty much reflected the staff practice at  
11 the time. So even though the guides didn't come out till  
12 1994, the methodologies that are in the guides had been  
13 followed for some years prior to that.

14 They are non-mechanistic assumptions. We know  
15 that they're conservative, and the most important thing is  
16 they did serve as a licensing basis for the operating plant  
17 population that exists right now. The NUREG, the draft  
18 NUREG-1465, encompasses the knowledge that's been gained --

19 MR. KRESS: What do you mean by the third bullet,  
20 that they were intentionally conservative assumptions in the  
21 source term?

22 MR. CONGEL: The behavior of the source term, for  
23 example, within containment was known in such a way to be  
24 more conservative than the behavior that was recognized at  
25 the time. Credit for certain cleanup systems, for example,



1 was limited intentionally by the staff to value so that we  
2 were comfortable with the fact that we knew it was better  
3 than what we were assuming.

4 MR. KRESS: Your word "conservative" means  
5 conservative behavior assumptions on the source term as it  
6 behaves and evolves in time inside the containment.

7 MR. CONGEL: That is correct.

8 MR. KRESS: It doesn't have implications of  
9 conservative with respect to risk.

10 MR. CONGEL: No. If anything, it would be the  
11 other way. The estimated risk, based on our assumptions,  
12 would be lower than it really is or from our calculations.  
13 I should have been careful with the term "conservative,"  
14 because obviously it can apply both ways.

15 What we did is make assumptions such that the off-  
16 site dose in the end would be higher than what we would  
17 expect given such a real accident. That is the conservatism  
18 that is implied by that third bullet.

19 MR. KRESS: Higher than you would expect from an  
20 accident like the design basis accident.

21 MR. CONGEL: I'm sorry. I didn't hear your whole  
22 question.

23 MR. KRESS: The dose would be higher than you  
24 would expect from an accident like the design basis  
25 accident.

1 MR. CONGEL: Yes, sir. That's what we would  
2 expect. But I want to emphasize that the staff, especially  
3 in the earlier days, went in the way they believed to be  
4 conservative, because all of the mechanisms were not fully  
5 understood. So if we're going to make any error, we wanted  
6 to make an error so that the design would be more robust.

7 MR. KRESS: I understand.

8 MR. CONGEL: NUREG-1465 is the NUREG that  
9 summarizes the result of a substantial number of years of  
10 research and experience both. I would say that the NUREG  
11 was published first actually about a year-and-a-half ago and  
12 it encompassed 30 years of research, but it probably  
13 reflects more the post-TMI research. But, of course, there  
14 were lessons learned and understandings of severe accidents  
15 that were incorporated, as well.

16 The NUREG is intended to be published in final  
17 form sometime this calendar year. That's all I will say for  
18 now. I'm not sure about a more exact schedule. If you're  
19 interested, I can have Len Soffer look, but we expect it to  
20 be published sometime this calendar year. It does reflect  
21 more accurately the manner in which the source term behaves  
22 in the containment.

23 And on this basis, using my earlier term,  
24 "conservative," we tried to have parameters expressed here  
25 that would more realistically predict the behavior of

1 radionuclides given an accident than we had in the past.

2 MR. DAVIS: Now, you're talking here, up to this  
3 point, about design basis accidents.

4 MR. CONGEL: Yes, sir.

5 MR. DAVIS: And the realism you're talking about  
6 is it's realistic for those cases in which the core melts  
7 and stays in the vessel, but it's not realistic for a design  
8 basis accident in which you don't exceed the 2,200 degrees  
9 clad temperature, or am I wrong?

10 MR. CONGEL: If we're talking about the way in  
11 which we're using the new source term, where we have design  
12 basis accidents that we study, the -- maybe this will be  
13 answered for you during the staff presentation. If I can,  
14 can I leave it at that? Because there are timing aspects of  
15 the new source term to reflect various stages of an accident  
16 that can progress to the point where you have an ex-vessel  
17 release.

18 Depending upon the way or the time at which you  
19 can truncate an accident, the other components may or may  
20 not appear.

21 MR. DAVIS: But my point is that a design basis  
22 accident involves no core melting.

23 MR. CONGEL: The ones that you can terminate,  
24 absolutely correct.

25 MR. DAVIS: But you're using this source term for

1 a design basis accident and you could not get this source  
2 term without melting.

3 MR. KRESS: The design basis accident for  
4 containment and siting and equipment qualification does  
5 assume substantial damage to the core.

6 MR. CONGEL: That's correct.

7 MR. KRESS: It's not the same design basis  
8 accident.

9 MR. DAVIS: That's right. So there's a disconnect  
10 between the design basis accident in terms of core  
11 temperature and the design basis of the source term.

12 MR. KRESS: They are two separate design basis  
13 accidents, yes.

14 MR. DAVIS: That's why I injected the use of the  
15 word "realism" or "physically based," because there's a  
16 disconnect between what really happens in a design basis  
17 accident and the source term.

18 MR. CARROLL: The design basis LOCA does not  
19 result in --

20 MR. DAVIS: Any melting.

21 MR. CARROLL: -- fuel damage.

22 MR. CONGEL: That's correct. But you use the  
23 source term for equipment qualifications, for sizing, for  
24 things of that sort.

25 MR. CARROLL: And leak rate.

1 MR. CONGEL: But, of course, the ultimate goal of  
2 all of this for design purposes is to have as great  
3 assurance as possible that an accident that happens within  
4 the design basis is truncated before anything bad happens.

5 We presently have a draft Commission paper that  
6 summarizes the staff positions on the source term as it  
7 applies to advanced reactors. We hope to issue it this  
8 month for comment. The status of it is it is in the EDO's  
9 office for final signature right now.

10 The manner in which the information has been used  
11 to date is for behavior insights for the ABWR, but the ABWR  
12 did use the TID source term, but the manner in which the  
13 source term was considered behavior-wise reflected some of  
14 the insights included in NUREG-1465.

15 The System 80+ review has been done using the new  
16 source term. You will be seeing the SER for that soon.  
17 There is an effort right now that is just beginning to see  
18 how the new source term could be used with operating  
19 reactors, but that's an effort that has just begun and  
20 certainly we'll be here to brief you on that as that effort  
21 unfolds, but that is just now beginning.

22 MR. DAVIS: According to your paper, the System 80  
23 changed. They started out with TID-14844 and they have  
24 recently switched to the one you're proposing now, is that  
25 right?

1 MR. DAVIS: It wasn't recent. Tom, do you know  
2 the exact date? I know the very first application came in  
3 using the TID source term. And after initial staff  
4 discussions, it was decided that they would go with the new  
5 source term. The SER has been prepared using the new source  
6 term and maybe we could tell the date that we switched.

7 MR. ESSIG: I believe it was about a year-and-a-  
8 half ago or so.

9 MR. DAVIS: Thank you.

10 MR. KRESS: Do you know why they did that?

11 MR. CONGEL: There are some potential benefits in  
12 the design using the new source term and the new source term  
13 assumptions.

14 MR. KRESS: Then that's what they were looking  
15 for, those benefits.

16 MR. CONGEL: Absolutely, yes. You will hear more  
17 about some of those details as the discussion unfolds.

18 MR. KRESS: Today?

19 MR. CONGEL: Yes. With that, I will turn the  
20 meeting over to Tom Essig.

21 MR. ESSIG: As Dr. Congel said, my name is Tom  
22 Essig and I will be continuing with the briefing. First, a  
23 few words on the source term itself, what we mean. These  
24 are consistent with what the staff has told the ACRS  
25 previously; that is the source term we're defining is a

1 release of fission products into containment and potentially  
2 available for release to the environment.

3 And certain general attributes that we speak of,  
4 timing and quantity of release, chemical and physical form,  
5 radionuclide composition, and the NUREG and the staff paper  
6 touch on these aspects. And certainly we have licensing  
7 uses for the source term in terms of siting evaluation,  
8 defining the environment systems and performance in-plant  
9 systems, and the effectiveness of mitigation features.

10 MR. DAVIS: Excuse me. I thought the 10 CFR Part  
11 100 -- the latest staff thinking was to decouple the source  
12 term from the siting requirements and take the source term  
13 out of Part 100. Am I confused about that?

14 MR. ESSIG: Yes. I believe that is still the  
15 case, but I was primarily talking historical uses here that  
16 we had in the source terms.

17 MR. DAVIS: Thank you.

18 MR. CONGEL: Excuse me, Tom. Let me add something  
19 here. The manner in which Part 100 traditional evaluations  
20 would be considered under the new staff proposal -- as you  
21 know, it is under discussion, but the proposal we have in  
22 place would be to change the location of what we  
23 traditionally call Part 100 evaluations of Part 50.

24 It would be done as part of the plant design  
25 review and although there would not be a direct coupling

1 with the site, like we did with ABWR, we would have one  
2 parameter associated with an accepted design, which would  
3 refer to a Chi over Q.

4 So you still would do, based on our proposal, a  
5 traditional type of an evaluation, but one of the parameters  
6 that would have to be evaluated once you go look at sites  
7 would be at what distance would you have to go out for an  
8 EAB to meet that Chi over Q.

9 MR. ESSIG: The Commission paper, which you  
10 received a draft of last month, as Dr. Congel mentioned, is  
11 in the EDO's office right now awaiting signature. It will  
12 go out as a draft for comment and there have been a few  
13 changes since the draft that you have received. I would  
14 describe them as not major changes, but there have been  
15 some; nothing that would impact the discussion of the 12  
16 implementation issues. It was more in the transmittal  
17 memorandum.

18 The NUREG-1465 that the Committee was briefed on  
19 previously really encompasses the entire spectrum of severe  
20 accidents. The Commission paper that we're discussing with  
21 you today introduces the notion that for DBA purposes, we  
22 would truncate that source term, and I will get into the  
23 truncation point in a moment.

24 We are not going to consider, for DBA purposes,  
25 that the licensing basis would be a severe accident. The



1 licensing basis would be a truncated source term.

2 MR. KRESS: Is there a rationale for that? Are  
3 you willing to go into why?

4 MR. ESSIG: I will get into some of that, yes. If  
5 I don't completely answer your question, maybe you can raise  
6 it again at that time.

7 In the enclosure to the paper, there are 12 what  
8 we've called implementation issues. Nine of them are  
9 directly linked to the source term; that is they exist  
10 because of the new source term. Three of them are related  
11 items which we're calling advanced light water reactor  
12 contemporary issues.

13 As we discuss those three issues, hopefully it  
14 will be clear why it is that they're not related, linked  
15 directly, but are issues that we're looking at on a current  
16 basis with the licensing of these advanced designs.

17 In the briefing on the NUREG-1465, the five phases  
18 of release of a severe accident progression were discussed  
19 with the Committee. For design basis purposes, we are  
20 proposing truncating the release at this point. That is we  
21 are going to assume that the pressure vessel remains intact  
22 and containment holds for the DBA purposes. We believe that  
23 that is consistent with the current approach for licensing.

24 That is there would be the least perturbation to  
25 the licensing basis having consider -- truncating the source

1 term at this point for DBA purposes.

2 MR. KRESS: So the rationale is that's more like  
3 what we have been using and it would create less  
4 perturbation to the licensing.

5 MR. ESSIG: I believe that to be the case, yes,  
6 unless there's others of the staff who have any  
7 amplification of that. But that's what I believe to be the  
8 case.

9 MR. CARROLL: When you say the vessel is intact,  
10 it's intact, but, in some way, communicating with the  
11 containment.

12 MR. ESSIG: Yes. Yes, it is. We would not have  
13 melt-through so that the molten core would undergo the core-  
14 concrete interaction, as you would find in a severe  
15 accident.

16 MR. CARROLL: But you also impose some mechanism  
17 to --

18 MR. ESSIG: Yes. Yes. We have to get activity  
19 out of the pressure vessels, certainly.

20 MR. KRESS: Does this rationale for truncating the  
21 accident there, did it include any considerations of  
22 probabilities that to go beyond that, you're suddenly  
23 getting into probability levels of things happening that are  
24 well beyond what was intended for the design basis accident?  
25 Is that sort of consideration in there?

1 MR. ESSIG: I can't cite any numeric values for  
2 you, but I believe that was certainly in our thinking. In a  
3 very big picture sense, we had certainly considered that,  
4 yes.

5 To put into graphical form what I've just said,  
6 basically we have the TID-14844 source term in terms of time  
7 appearing instantaneously in containment and then we assume  
8 it's at that level pretty much consistently throughout the  
9 course of the accident.

10 For DBA purposes, and I've deliberately drawn this  
11 a little fuzzy, but to show that around in here somewhere  
12 and beyond that, we would have the severe accident  
13 considerations.

14 MR. KRESS: Is that scale over there -- is that  
15 curies or mass or fraction?

16 MR. ESSIG: It's a surrogate for activity, yes,  
17 for curies. There deliberately weren't any units put on  
18 there. It's just meant to be a semi-quantitative portrayal.

19 MR. KRESS: I understand.

20 MR. DAVIS: It could be Bequerels, I guess.

21 MR. ESSIG: I'm sorry?

22 MR. DAVIS: It could be Bequerels.

23 MR. CONGEL:

24 MR. ESSIG: Yes. The second issue on iodine  
25 chemical form, as the NUREG-1465 had said and based on a lot

1 of research at principally Oak Ridge National Laboratory,  
2 that we believe the release into the containment will be  
3 primarily cesium iodide and that the I-2, the elemental and  
4 the more reactive form of iodine, will be inhibited if the  
5 pH in the containment sump is maintained in excess of seven.

6 We feel that it's really essential that that pH in  
7 the sump be controlled so that it's greater than seven.  
8 There are going to be a number of challenges to that pH  
9 during the course of an accident, including radiolytic  
10 decomposition of the cable insulation, formation of carbonic  
11 acid from the CO2 in the atmosphere, formation of nitric  
12 acid, and all these are going to tend to drive the pH down  
13 below seven. And, of course, the boric acid present.

14 So there has to be a fair amount of buffering  
15 capacity in the sump, for example, in order to maintain that  
16 in excess of seven.

17 MR. DAVIS: Excuse me. This issue came up on the  
18 ABWR and we were told by GE, if I recall correctly, that the  
19 sump pH would be kept above seven by the formation of cesium  
20 hydroxide, which would be a natural process as the cesium is  
21 released from the core, and that they wouldn't propose, as I  
22 recall, to use any additional chemical control in the sump.

23 Have you looked at that and does the staff agree  
24 with that?

25 MR. ESSIG: Of course, for the ABWR, they were

1 using the old TID source term.

2 MR. DAVIS: Right.

3 MR. ESSIG: So we did not credit them with the --  
4 I believe that the iodine that we assumed was released in  
5 the case of the ABWR to the containment was as I-2. Is that  
6 correct, Jay?

7 MR. DAVIS: You've got plenty of cesium, even if  
8 it's formed --

9 MR. KRESS: The issue came up with ABWR in the  
10 context of the PRA in severe accidents. There, I think it  
11 is entirely appropriate to talk about cesium hydroxide.

12 MR. DAVIS: Why wouldn't it be here, also?

13 MR. KRESS: Because they used the old source term,  
14 the ABWR did, which makes 95 percent of it as I-2. It's not  
15 an issue then. If you make that assumption, you don't have  
16 to worry about I-2 release being inhibited by pH.

17 MR. CARROLL: By contrast, of course, Pete, System  
18 80+ is planning to put trisodium phosphate baskets in the  
19 sump.

20 MR. ESSIG: Yes, that's correct.

21 MR. CARROLL: Having the need for some trisodium  
22 phosphate the other day to clean some stuff before painting,  
23 I convinced myself that what I told them was correct. This  
24 stuff does not go into solution very readily if it's been  
25 sitting there and gets all caked up. In fact, I took a

1 hammer and a coal chisel to break it up before I could  
2 dissolve it.

3 MR. ESSIG: The remaining five percent of the  
4 iodine the staff is saying will be split between elemental  
5 and organic. We feel that of that five percent fraction,  
6 that not more than five percent of it or a total of .25  
7 percent will appear as an organic form in the containment.  
8 An example might be methyl iodide.

9 Then the remaining 4.75 percent, and I'm not  
10 trying to suggest any precision here by three significant  
11 figures, but that's just simply five minus .5, we end up  
12 with 4.75 percent.

13 MR. DAVIS: That is more than EPRI specifies.

14 MR. ESSIG: Yes, it is.

15 MR. DAVIS: But I guess that is not a significant  
16 difference. They're talking about .15 percent.

17 MR. ESSIG: Yes. They have suggested that this  
18 upper value is three percent of the five percent and we have  
19 the matter under discussion with them, have had it under  
20 discussion with them. We are aware of that difference.

21 MR. DAVIS: Thank you.

22 MR. ESSIG: The third issue, then, is equipment  
23 survivability for the severe accident environment. In this  
24 case, we're saying that we do have reactor pressure vessel  
25 failure. That is the core does exit the vessel through a

1 failure in the vessel, melt-through, and allows core-  
2 concrete interaction to progress, and that we generate, in  
3 the process, a fairly large volume of particulate, a lot of  
4 non-radioactive aerosol in the containment as a result of  
5 this interaction.

6 Of course, it's just only the radiation  
7 environment, but the evaluation of survivability has to  
8 consider these other parameters, as well, like temperature,  
9 pressure and humidity at some extreme values.

10 Our acceptance is based on the level of  
11 confidence, reasonable level of confidence that the  
12 equipment will survive and operate over the required time  
13 span.

14 MR. DAVIS: Are we still talking here about the  
15 design basis?

16 MR. ESSIG: No.

17 MR. DAVIS: We're into severe accidents now.

18 MR. ESSIG: We're in severe accident space here  
19 now, yes.

20 MR. DAVIS: Thank you.

21 MR. ESSIG: Yes. The issue No. 4 is the first one  
22 that was really then developed by the staff independently of  
23 the source term research. The issue, for our purposes here  
24 today, was based on a GE request for removal of the main  
25 steam isolation valve leakage control system, really for the

1 ABWR and for currently operating BWRs that have leakage  
2 control systems.

3 The staff has this under review right now for one  
4 of the operating plants that's serving as lead, the Hatch  
5 plant, and then we have also reviewed it for the ABWR.  
6 Simply, what it does, the model allows MSIV leakage to  
7 deposit in the steam piping and condenser and that we are  
8 having to insist that it remain structurally intact after an  
9 earthquake to act as a hold-up volume.

10 Now, it's just going to be transmitting relative  
11 small flow rate, just the leakage past the MSIV. So we're  
12 talking something on the order of maybe a few cubic feet per  
13 minute.

14 Initially, since the steam piping will still be  
15 quite hot, it will cool down during the accident. So  
16 probably initial deposition will be down in the cooler  
17 areas, such as the condenser, and then ultimately the steam  
18 line will also serve as a reservoir.

19 Our model credits the deposition of particulate  
20 and elemental iodine. As mentioned, we have applied it to  
21 the ABWR. It was included in the material that has been  
22 discussed or presented to the ACRS previously. The SBWR  
23 will be reviewed in similar fashion for that credit.

24 MR. CARROLL: What state is the condenser in? Is  
25 it still under vacuum?



1 MR. ESSIG: Jay, could you --

2 MR. CARROLL: Or if it isn't, how do you prevent  
3 leakage out of the turbine seals?

4 MR. LEE: This is Jay Lee. Initially, we assume  
5 it to be a vacuum, yes. But later on, we assume that the  
6 vacuum is no longer maintained.

7 MR. CARROLL: So initially, then, you've got air  
8 ejectors operating and some of this is going out of the  
9 condenser.

10 MR. DAVIS: I thought there was a radiation  
11 isolation sequence on the air ejector.

12 MR. LEE: Right. At the onset of a design basis  
13 accident, such as LOCA, you air eject this and it's tripped.  
14 Whatever residual negative pressure is inside the condenser  
15 is just for a relatively short period of time.

16 MR. CARROLL: So you have isolated the air  
17 ejector.

18 MR. LEE: Right.

19 MR. CARROLL: How about the turbine seal system?

20 MR. LEE: Also isolated.

21 MR. CARROLL: Those are both automatic actions.

22 MR. LEE: Right. And the condenser itself will  
23 have some residual negative pressure for a short period of  
24 time. But, in essence, we assume the condenser will be at  
25 atmospheric pressure.

1 MR. CARROLL: But the leakage implies that there  
2 is some steam coming down the line, too. We don't have  
3 seals on the turbine any longer. So we are going to have  
4 some radioactivity leaking out of the turbine seals.

5 MR. LEE: The pathway we assumed for the MSIV  
6 leakage will be through the main steam line, then main steam  
7 drain lines, then going into the condenser.

8 MR. CARROLL: Yes.

9 MR. LEE: Those are the least resistible pathways  
10 and that's the way we assumed.

11 MR. CARROLL: Okay. But either the condenser is  
12 going to pressurize under those circumstances or the  
13 condenser will pressurize under those circumstances and  
14 there will be leakage out of the turbine seals.

15 MR. LEE: We really assumed the condenser to be  
16 really open and the leakage is such a small amount. Such as  
17 like in the case of ABWR, we assumed 140 standard cubic feet  
18 per hour leakage. It's very small leakage.

19 MR. CARROLL: Right.

20 MR. LEE: And we don't think it will really  
21 pressurize the condenser and the condenser is open and it's  
22 a pathway right out to the environment.

23 MR. KRESS: This is still a Chapter 15 analysis.

24 MR. LEE: Yes.

25 MR. KRESS: That you're talking about. It's one

1 of the accidents. I don't think they even consider that  
2 pathway as a barrier, other than its ability to collect  
3 fission products as they hold up and pass through. The  
4 calculation is -- they make a thermal hydraulic calculation  
5 and get a flow rate and assume it's got a big hole in it, I  
6 think, is basically what they say.

7 MR. CARROLL: A big hole in the condenser.

8 MR. KRESS: Yes. There is a pathway for it to  
9 come out into the turbine building there.

10 MR. CARROLL: Is that right?

11 MR. LEE: Yes.

12 MR. KRESS: For Chapter 15 purposes, that's the  
13 way they view it.

14 MR. CARROLL: Okay. That's all I was asking. It  
15 comes out through the seals.

16 MR. LEE: Yes.

17 MR. KRESS: They assume it has a way to get out.  
18 It's to see if you meet 10 CFR 100 under this accident  
19 condition.

20 MR. CARROLL: Okay.

21 MR. ESSIG: The next issue really applies only to  
22 the SBWR, which we haven't yet really begun our review of  
23 that or the review is in the very early stages. The SBWR  
24 has an enclosure that they're calling a safety envelope,  
25 which is a concrete structure surrounding primary

1 containment.

2           The design leak rate of this is 25 volume percent  
3 per day and it's to be verified by a combined license  
4 holder's -- it will be an item in the combined license  
5 holder's technical specifications to verify that leak rate.

6           And the applicant, GE in this case, is simply  
7 requesting fission product hold-up in this. So that it's  
8 not intended and it's not maintained under a large negative  
9 pressure. It just would allow the primary containment  
10 leakage to pass through this volume and have some hold-up  
11 and then leak out to the environment. We're simply just  
12 crediting that hold-up.

13           I should say it's under review, because we haven't  
14 yet finished our SBWR review. The fission product release  
15 timing, as I mentioned earlier, the TID source term was  
16 assumed to appear instantaneously in containment. The  
17 NUREG-1465 provided a basis for a mechanistic time sequence  
18 from time zero to full core melt.

19           For DBA assessments, the PWR core melting would  
20 begin about 30 to 40 minutes into the event, and, the BWR,  
21 60 to 70 minutes into an event.

22           The staff has left the door open to consider  
23 design-specific timing, if sufficiently justified by the  
24 applicant. We know, for example, that the AP-600 may be  
25 requesting us to consider values that are on the order of an

1 hour rather than these values shown.

2 The impacts of timing impacts a number of areas in  
3 terms of a delay of appearance into the containment.

4 Impacts are design basis accident assessments, the control  
5 room habitability, the system operation, containment MSIV  
6 closure times, containment purge isolation time, diesel  
7 generator start time.

8 So these times here, when we go from an  
9 instantaneous, have a number of implications for delayed  
10 action on a number of systems.

11 MR. DAVIS: How does it effect a diesel generator  
12 start time?

13 MR. ESSIG: I'm sorry.

14 MR. DAVIS: How does it effect a diesel generator  
15 start time?

16 MR. ESSIG: Because there is a delay in the  
17 appearance of activity in containment, we would perhaps not  
18 -- I should point this out. This is something under  
19 consideration. We haven't actually elected to use a  
20 specific value yet.

21 But there may be some justification for not  
22 insisting that the diesel generators start up and load like  
23 they currently -- as the current requirement.

24 MR. DAVIS: Yes, but they still will for meeting  
25 the 2,200 degree F clad temperature requirement.

1 MR. ESSIG: Yes.

2 MR. DAVIS: So I think that's going to intercept  
3 any --

4 MR. ESSIG: It may well override this, yes.

5 MR. KRESS: I guess one of the questions that I  
6 had asked prior to the meeting be addressed was what impact  
7 does the release definition and the release timing have on  
8 risk. I presume that's part of the thing to be addressed  
9 next meeting.

10 MR. ESSIG: Yes, it will.

11 MR. KRESS: But it could impact risk. It could be  
12 one of your bullets up there.

13 MR. ESSIG: Yes. We will address that next time.

14 MR. CARROLL: But, Pete, on the diesels, if  
15 somebody is taking credit for leak before break and with  
16 this additional credit and it's during a realistic large  
17 break LOCA, perhaps this does make a difference.

18 MR. DAVIS: If they're allowed to do a realistic  
19 one, yes. But I think they're still constrained to the  
20 Appendix K --

21 MR. CARROLL: No. No. They can do a realistic  
22 one.

23 MR. CATTON: They can do best estimate, if they  
24 want.

25 MR. DAVIS: And that would be accepted?

1 MR. CARROLL: Yes. That's been the situation for  
2 two or three years.

3 MR. DAVIS: For advanced reactors.

4 MR. CATTON: And existing.

5 MR. CARROLL: Existing, too.

6 MR. DAVIS: Okay.

7 MR. CARROLL: They have that option.

8 MR. ESSIG: The next issue is aerosol deposition  
9 in containment. As a reminder, in the TID source term, the  
10 staff said that 50 percent of the iodine release would plate  
11 out in the containment, on the containment surfaces. The  
12 current staff position considers two natural processes for  
13 aerosol removal in containment.

14 First, just sedimentation, gravitational settling  
15 and agglomeration of particles in the containment  
16 atmosphere, and then there are two diffusion mechanisms,  
17 both of which are difficult to pronounce -- diffusiophoresis  
18 and thermophoresis, referring to condensation processes on  
19 the heat sink and the other due to thermal gradients.

20 All of these processes are essential when no spray  
21 system is provided, like the AP-600, for example. The staff  
22 will, during its review of the AP-600 --

23 MR. KRESS: Let me ask you a question about that.  
24 What you have is a specification of a fission product  
25 quantity versus time. What you're telling me is that that

1 specification came out of calculations that included these  
2 mechanisms. Is that how I interpret this bullet?

3 MR. ESSIG: Were you referring to the TID source  
4 term or the --

5 MR. KRESS: No. The current staff source term.

6 MR. ESSIG: No. The calculations of core release  
7 fractions were done independently of the amount that would  
8 deposit within the containment, if I understood your  
9 question.

10 MR. KRESS: So your specification is a source of  
11 fission products versus time and you're saying that when the  
12 applicant does his calculations to deal with these, you will  
13 allow him to calculate these mechanisms --

14 MR. ESSIG: Yes.

15 MR. KRESS: -- as processes that will be  
16 influential in the ongoing.

17 MR. ESSIG: Yes. And as I mentioned, for the AP-  
18 600 design, that will take on a greater degree of importance  
19 because of the lack of a spray.

20 MR. KRESS: I see. I understand what you're  
21 saying.

22 MR. CARROLL: What does the word "essentail" mean?

23 MR. ESSIG: I'm sorry. It's a new spelling of  
24 "essential" from the dyslexic typist who put these slides  
25 together -- myself.



1           The next issue is related, aerosol removal by the  
2 BWR suppression pool. This issue also predates the source  
3 term work and we have a standard review plan, 6.5.5, which  
4 credits removal of particulate and elemental iodine by  
5 scrubbing in the pool, that is the amount that does go  
6 through the pool.

7           The ABWR suppression pool was credited, even  
8 though the review was based on the TID source term. We have  
9 been crediting operating plants with that same -- using that  
10 same SRP section. The SBWR suppression pool will be  
11 reviewed for credit and it, of course, does reference the  
12 new source term.

13           The containment spray is -- we're saying here that  
14 there is a different spectrum of atmospheric contaminants,  
15 primarily particulates, that we need to remove from the  
16 atmosphere relative to the TID source term. I'm really  
17 focusing here now on the iodine that would be removed,  
18 although we do have potentially other radionuclides in the  
19 spectrum in addition to the iodine, which the TID -- I mean  
20 other than noble gases, of course. The TID just focused  
21 primarily on the iodines.

22           The two evolutionary designs, both the ABWR and  
23 the System 80+, provide safety-grade spray systems. The  
24 ABWR, as we mentioned, was designed to the TID source term.  
25 No credit was requested by GE for that spray and, likewise,

1 the staff did not give any credit in the SER.

2 System 80+ is designed to the new source term.  
3 ABB/CE has asked for credit and the staff has given credit  
4 for spray removal systems. You will be hearing from us on  
5 that, as far as the System 80+ is concerned, I believe it's  
6 in the April timeframe for Chapter 15.

7 The passive designs, because of their nature, are  
8 not provided with safety-grade spray systems because they  
9 would be active components -- would require the use of  
10 active components. So the SBWR does provide a safety spray  
11 -- I mean a containment spray, but it's a non-safety system.

12 The AP-600 provides no spray, either safety or  
13 non-safety variety.

14 MR. CARROLL: What is the Westinghouse rationale  
15 for that?

16 MR. ESSIG: For not providing even a non-safety  
17 spray? They feel they can meet Part 100 without one, and if  
18 they don't have to install.

19 On the point of use of atmospheric cleanup systems  
20 and generic safety features, the new source term will have  
21 some implications for them, as well. Typically, ESF  
22 atmospheric cleanup systems include both HEPA filters and  
23 charcoal absorbers.

24 In our assessment of some of the impacts of the  
25 new source term, there will likely be made more demands on

1 HEPA filters in that, of course, the iodine, as we  
2 mentioned, was in particulate form. We will give credit for  
3 DBA purposes, as we did in the System 80+ review. We  
4 considered it in the mitigation of severe accident  
5 consequences. Then, of course, the large concentrations of  
6 non-radioactive aerosols from the core-concrete interaction  
7 in severe accidents will place an additional demand on the  
8 HEPA filters, as well.

9 The charcoal, on the other hand, as long as pH  
10 control is maintained and the iodine that we're faced with  
11 removing is primarily in the particulate form, that the  
12 staff may consider reducing the pedigree of the charcoal.  
13 That is we may not require that charcoal in all cases meet  
14 the Regulatory 1.52 pedigree.

15 But where it is needed to meet -- as an example,  
16 in the System 80+ review, the control room habitability  
17 system does have ESF grade charcoal. Throughout the rest of  
18 the design, it does not.

19 MR. KRESS: Will your source term specification  
20 then include a source of non-radioactive aerosols that the  
21 HEPA filters have to deal with?

22 MR. ESSIG: The Commission paper itself does not  
23 contain that. It would be for the purpose of severe  
24 accident assessments. I don't know that we have an answer  
25 to that question at this point. We can get back to you next

1 month on that, unless any of the staff --

2 MR. KRESS: I'm getting a little bit confused  
3 because the source terms we're talking about generally are  
4 divorced from severe accident space. Then I see a bullet  
5 like that that talks about concentrations of non-radioactive  
6 aerosols. I'm still assuming that's in design basis space.

7 If the design basis of the filter systems is based  
8 on source terms and we fully expect there to be aerosols  
9 there that are non-radioactive, shouldn't they be part of  
10 the source term specification?

11 MR. ESSIG: Perhaps this is confusing. What was  
12 intended here was that the non-radioactive aerosols would be  
13 formed primarily by the core-concrete interaction, which is  
14 beyond the design basis.

15 MR. KRESS: That's not necessarily the case.  
16 There are a lot of non-radioactive aerosols that are formed  
17 as part of the in-vessel early release, coming from the  
18 structural members and the clad and other things there.

19 So there's an amount to those that is fairly  
20 sizable coming out of that part of it. Is that to be part  
21 of the design basis for these filters?

22 MR. ESSIG: I believe we'd have to -- yes, answer  
23 affirmatively.

24 MR. KRESS: There will be a source of those, then.

25 MR. ESSIG: Yes.

1 MR. KRESS: Okay. That's all.

2 MR. CARROLL: I'm still puzzled by the answer. So  
3 as a designer, if I am going to specify these HEPA filters,  
4 will I satisfy the NRC's requirements if I only consider in-  
5 vessel phenomena?

6 MR. ESSIG: For design basis purposes?

7 MR. CARROLL: I didn't distinguish it.

8 MR. ESSIG: You didn't qualify that.

9 MR. CARROLL: I just said will I satisfy the NRC's  
10 requirements if I only consider the demands on the HEPA  
11 filters from in-vessel effects.

12 MR. ESSIG: We would review that in two contexts,  
13 really. The first context in which we would review it is  
14 its ability to mitigate and meet the design basis accident.

15 MR. CARROLL: Okay.

16 MR. ESSIG: And then, secondly, it would be  
17 considered as part of the severe accident assessment.

18 MR. CARROLL: That's what I wanted to hear. Now,  
19 do we potentially get into a situation on these HEPA filters  
20 where we're loading them up with so much more radioactivity  
21 than we ever considered before, that we're going to have  
22 some fire problems?

23 MR. ESSIG: I don't know if I can answer that  
24 question at this point. We may have to get back to you on  
25 that next month when we talk about some more of the detail.

1 MR. CARROLL: Okay.

2 MR. ESSIG: If that's acceptable.

3 MR. CARROLL: Sure.

4 MR. ESSIG: Another issue that is really unrelated  
5 to the implementation of the new source term is -- I've just  
6 called this, for short, an on-site atmospheric diffusion  
7 model, which has been developed pretty much concurrently  
8 with the new source term efforts.

9 Its purpose primarily is to estimate the airborne  
10 radioactivity concentrations at the control room intake.  
11 So these would be from various leakage sources and would be  
12 then carried over to the control room intake. For a number  
13 of years, the staff has been using what we commonly call the  
14 Murphy Kampe model for this purpose.

15 We have a new model which we're introducing as  
16 part of a control room habitability system evaluation and  
17 code development.

18 MR. SEALE: This would have general applicability,  
19 then, to close-end source --

20 MR. ESSIG: Yes, it would.

21 MR. SEALE: Exposure models for whatever.

22 MR. ESSIG: Yes. As I understand it, if one back-  
23 calculates the concentration to the source, the  
24 concentration in the actual vent itself is obtained, the  
25 source of the release. The problem with most back-

1 extrapolations to the source is that they tend to go to  
2 infinity on us. This one correctly gives the vent release  
3 concentration.

4 MR. SEALE: Sources or zero.

5 MR. ESSIG: Right. Ultimately, the staff intends  
6 to use this for both operating plants and the advanced light  
7 water reactor designs.

8 MR. DAVIS: Is there a name for this model?

9 MR. ESSIG: I don't know if the model has a name  
10 yet. Does it, Jay? It's part of the CONAB code. It is  
11 part of the -- or, in fact, I think it's now called HABIT,  
12 is it not? Is that correct, Len? It will be published, I  
13 believe, as a NUREG-CR report, this model called HABIT, and  
14 this dispersion routine will be part of that.

15 The last of the issues really relates only to the  
16 SBWR. The SBWR has a passive containment cooling system  
17 which removes decay heat after a LOCA, and these loops are  
18 actually an extension of the containment and don't have  
19 isolation valves. We consider their failure to be a new  
20 DBA, since it would result in containment bypass. This will  
21 be reviewed as part of the SBWR review.

22 MR. CARROLL: Is there a GDC that says you can't  
23 do that?

24 MR. ESSIG: That says that we can't --

25 MR. CARROLL: A design cannot have things going

1 outside the containment that aren't isolable.

2 MR. ESSIG: I'm not familiar. I don't know.

3 MR. KRESS: It doesn't really go outside  
4 containment. It's just an extension of containment, isn't  
5 it?

6 MR. ESSIG: Yes, I believe. Yes.

7 MR. KRESS: It's like a closed loop. It comes  
8 back.

9 MR. ESSIG: Yes.

10 MR. CARROLL: I understand. I understand.

11 MR. KRESS: That's not like something that goes to  
12 the turbine.

13 MR. CARROLL: I know. It's like a PWR RHR system,  
14 but in that case, you do have isolation valves at the  
15 containment in case something happens.

16 MR. SEALE: It's really more of a failure of  
17 containment rather than a bypass of containment.

18 MR. ESSIG: Yes. to summarize where we are, on  
19 the last two slides, I have tried to address the four ALWR  
20 designs that the staff currently has under review. As  
21 mentioned, for the ABWR, the TID source term was used by  
22 both the applicant and the staff.

23 Credit for deposition in steam lines, that is the  
24 MSIV leakage that I mentioned earlier, that was credited for  
25 the ABWR review. The ABWR Subcommittee was briefed on this



1 in December on Chapter 15.

2 The System 80+, the Committee has not yet been  
3 briefed on it. That's scheduled for April 1994. In this  
4 design, both the staff and the applicant have used the  
5 NUREG-1465, as modified by the draft Commission paper.

6 In the case of the AP-600 and SBWR, these are both  
7 in earlier stages of review. In both cases, the applicant  
8 has based its accident analyses on the EPRI source term,  
9 which is pretty close to the staff's source term. We do  
10 have some differences in the fraction of low-volatile  
11 radionuclides, the fraction of organic iodine that appears,  
12 as we discussed earlier, and there are some slight  
13 differences in timing, as well.

14 The staff will base its accident analysis on the  
15 final NUREG-1465 and the Commission paper and, of course,  
16 the ACRS briefing is not yet scheduled. For the SBWR, a  
17 similar situation, using the EPRI source term and the staff  
18 will, again, base its analysis on the NUREG and the  
19 Commission paper.

20 MR. KRESS: Does that mean you will redo the  
21 Chapter 15 calculations using a different source term when  
22 you make the SER?

23 MR. ESSIG: The staff will use -- redo in the  
24 sense that we will perform an independent evaluation.

25 MR. KRESS: For all of the Chapter 15 accidents or

1 selected ones?

2 MR. ESSIG: Those that have radiological  
3 consequences off-site or to the control room.

4 MR. KRESS: Okay.

5 MR. ESSIG: That concludes our briefing, if there  
6 are other questions that we can entertain now or entertain  
7 next month at the subsequent briefing.

8 MR. SEALE: Earlier, I think it was on your third  
9 slide, you made a comment to the effect that you had not  
10 determined what the application of this new 1465 source term  
11 would be to the operating plants.

12 MR. ESSIG: Yes.

13 MR. SEALE: Do you expect that there will be an  
14 application?

15 MR. ESSIG: Yes, we do.

16 MR. SEALE: I'm curious as to how we believe,  
17 then, that the ABWR will evade similar reevaluation.

18 MR. ESSIG: This evaluation would be at the  
19 request of licensees. It wouldn't be something that the  
20 staff would impose on licensees. We would make the source  
21 term insights available and licensees, either singly or as  
22 owners groups, would approach the staff and request that  
23 certain aspects of the new source term be reviewed and  
24 appropriate credit given to systems.

25 MR. SEALE: I must confess that I have a real

1 problem understanding down the road as the 1465 methodology  
2 develops credibility, as I assume that it would be, that the  
3 holder of the combined license, the COL applicant, wouldn't  
4 really be forced just to be compatible with everything else,  
5 to go through and do all of that evaluation over again using  
6 1465.

7 MR. KRESS: If I could speak for this question.  
8 The expectation is that there are a number of effects of  
9 using the different source term. One is you would have a  
10 more realistic set of things to do equipment qualification  
11 with. You're dealing with better timing, better quantities,  
12 better --

13 MR. SEALE: Exactly.

14 MR. KRESS: -- things. Now, there is a case where  
15 you might expect them to come back and say we'd like to see  
16 what this has on your equipment qualification, and I agree  
17 with you on that. But I would like to -- along the lines of  
18 your question about the operating plants, the nature of the  
19 questions -- the major question that I asked the staff in my  
20 pre-guidance to this was that the ACRS is almost  
21 exclusively, but not exactly, interested in risk  
22 implications of things and that our primary interest would  
23 be in what are the risk implications of new source terms.

24 I would expect the staff to then respond to that  
25 by saying here's what the new source terms are, here's what

1 we expect to be the result of having new source terms. It  
2 might change the sprays. It might change the containment  
3 design. It might change equipment qualification. The  
4 question is how might it change them, how much might it  
5 change them, and what does that do to our understanding of  
6 what risk is.

7 That was the nature of my question. I think we  
8 may hear some of that next time, I hope.

9 MR. ESSIG: Yes.

10 MR. KRESS: That's sort of the guidance I have  
11 given them and that may answer some of your questions.

12 MR. SEALE: Thank you.

13 MR. ESSIG: Thank you.

14 MR. CARROLL: I'm still a little concerned about  
15 this SBWR situation. I guess I can read somewhere in the  
16 combination of GDC-16, 38, and, I guess, in particular, 54,  
17 a need for isolation valves on that loop that goes outside  
18 of containment. As with GDCs, in general, they are a matter  
19 of interpretation.

20 MR. ESSIG: Yes.

21 MR. CARROLL: But I think that's a serious  
22 question that I hadn't thought about before.

23 MR. KRESS: What was it, again?

24 MR. CARROLL: Whether GE should have the  
25 capability of isolating this loop. It's two loops.

1 MR. ESSIG: Jay, do you recall how many loops in  
2 BCCS?

3 MR. KRESS: I thought we asked that question to GE  
4 and their answer was that the whole loop is designed for the  
5 full design basis accident pressure. That was, I thought,  
6 the answer to that. I don't recall precisely, but that's  
7 what I thought it was.

8 MR. CARROLL: So?

9 MR. KRESS: So that makes it just part of the  
10 containment and why should it be treated differently.

11 MR. McCracken: Conrad McCracken, NRR. This is  
12 exactly the issue that we've been struggling with. The  
13 interpretation GE would like us to take is that, in fact,  
14 this is part of containment, it meets the same design  
15 requirements as containment, and, therefore, we don't feel  
16 it's a system coming outside of containment for isolation  
17 functions.

18 We are not unanimous within the staff as to  
19 whether we can agree with that position or not.

20 MR. CARROLL: A heat exchange system banging and  
21 rattling in the pool doesn't exactly strike me as being the  
22 same as a reenforced concrete containment shell.

23 MR. McCracken: That is correct and that is why  
24 some of us have -- we haven't come to an agreement. This is  
25 one we have no doubt will wind up at the Commission for a

1 policy decision on which way we go.

2 MR. CARROLL: Okay. I'm happy as long as I know  
3 people are looking at it.

4 MR. KRESS: If there are no more questions, I'd  
5 like to thank the staff for this presentation. I found it  
6 very useful and to the point. We look forward to seeing the  
7 real question next time.

8 MR. WILKINS: I believe those are on our agenda  
9 for the March meeting. Gentleman, we have a few minutes. I  
10 propose to go back to the agenda item that we were in the  
11 middle of at the end of the morning session.

12 [Whereupon, at 1:53 p.m., the Committee met in  
13 Executive Session.]

14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

[2:17 p.m.]

1  
2 MR. WILKINS: We're back on the record. The next  
3 item on the agenda is a discussion of protection against  
4 malevolent use of vehicles at nuclear power plants. Part of  
5 this meeting will be closed. As I said at the beginning of  
6 this morning, we have received requests from Mr. Harner of  
7 the Nuclear Control Institute and Mr. Portzline, who is a  
8 private citizen, to address the Committee. At an  
9 appropriate time, I will call them to the podium and ask  
10 them to say what they wish to say.

11 Is Mr. Harner here? Mr. Harner, do you understand  
12 how much time you have?

13 MR. HARNER: I understood we'd have about ten or  
14 15 minutes to make a presentation and ten or 15 minutes for  
15 questions and answers.

16 MR. WILKINS: Very good. Mr. Portzline?

17 MR. PORTZLINE: Yes.

18 MR. WILKINS: We've got you down for not quite as  
19 much.

20 MR. PORTZLINE: That's all right.

21 MR. WILKINS: You asked for something like five  
22 minutes.

23 MR. PORTZLINE: That's fine.

24 MR. WILKINS: It will be important for you  
25 gentlemen and also Mr. Whitesel -- where is Mr. Whitesel?

1 It will be important that you gentlemen stay within your  
2 time limitations. And I'm going to warn all of you -- Mr.  
3 Whitesel, I'm sure you have been here before and you know  
4 what I'm talking about. But for the other two gentlemen,  
5 you don't have complete control over that time, because we  
6 may interrupt you and ask you questions.

7 That's why it's important that you plan in your  
8 overall allocation to give us roughly equal time to ask you  
9 questions and for you to answer them.

10 MR. LINDBLAD: Mr. Chairman, because Mr. Harner is  
11 sitting with the NRC staff, do I understand that he is a  
12 consultant or contractor to the NRC?

13 MR. WILKINS: I think that inference is not  
14 warranted, but why don't we suggest that Mr. Harner and Mr.  
15 Portzline sit over at this table, which is sort of our  
16 witness table, and avoid the implication.

17 MR. LEWIS: That's spacial discrimination.

18 MR. WILKINS: That's spacial discrimination, but  
19 they don't look like they mind. So that's all right. I  
20 think they will be more comfortable over here anyway. Get  
21 yourself situated and we'll go on with the initial  
22 presentation, which will start with an introduction by the  
23 Chairman of our Subcommittee, Dr. Lewis.

24 MR. LEWIS: I'm impressed that we're outnumbered  
25 by visitors. This is a subject which has come to us before



1 and we're continuing a multi-log with the staff, the  
2 industry, some private citizens, and there's really very  
3 little for me to say, except to remind you that we have  
4 heard presentations from the NRC staff.

5 There has been the notice of proposed rulemaking  
6 out. There have been public comments received from a number  
7 of organizations. The ACRS, at the last meeting -- no,  
8 earlier than the last meeting.

9 MR. WILKINS: December, actually.

10 MR. LEWIS: Wrote a letter of dubious genealogy to  
11 the Commission about it generally, expressing concern about  
12 the scheduling and the analysis that went into the proposed  
13 rule. The ACRS, it's fair to say, was deeply divided on the  
14 subject and a substantial minority, though a minority, felt  
15 that the proposed rule was prudent.

16 We're simply continuing the conversation now,  
17 extending the conversation as the proposed rule moves along.  
18 My understanding is that the staff will tell us what they  
19 have decided to do in terms of the public comments that  
20 we've received. NUMARC is here, various others are here.  
21 We'll go through them as we go along and I think we should  
22 just proceed with the show.

23 Is that agreeable, Mr. Chairman?

24 MR. WILKINS: Yes. The agenda calls for a NUMARC  
25 presentation, followed by Nuclear Control Institute, and

1 then Mr. Portzline, and then Mr. McKee or someone from the  
2 NRC. Is Mr. McKee the correct one?

3 MR. LEWIS: That's the agenda I have.

4 MR. WILKINS: Very good. So why don't we then  
5 start with Mr. Whitesel from NUMARC?

6 MR. LEWIS: I think we should do that. I will  
7 repeat, Ernest, admonition to please don't feel any  
8 compulsion to use your allotted time.

9 MR. WILKINS: I guess the only other thing, Hal,  
10 that I ought to say before Mr. Whitesel starts is the  
11 Committee is aware that one of the Commissioners has  
12 expressed a specific interest in having this Committee look  
13 at this issue, and that's --

14 MR. LEWIS: One of the Commissioners has been  
15 explicit about it, but presumably each of the Commissioners  
16 are eagerly awaiting our views.

17 MR. WILKINS: All of them are interested, yes.

18 MR. WHITESEL: Good afternoon. My name is Bob  
19 Whitesel. I'm a Manager in the Operations Management and  
20 Support Services Division at NUMARC and I was responsible  
21 for the development of the comments that the industry  
22 submitted on this proposed rule.

23 I understand that the purpose of the presentation  
24 that you have requested this afternoon is for me to review  
25 and possibly clarify the industry comments on that proposed

1 rule. So I have put together what will take about 18  
2 minutes, uninterrupted, which I understand is a fiction in  
3 these meetings, to complete that.

4 So I expect you to interrupt me. And if my  
5 understanding of the reason I'm up here is different, please  
6 let me know right now.

7 MR. WILKINS: I think that's good. I might  
8 question whether 72 percent of the allotted time is not too  
9 high, but we'll find out.

10 MR. WHITESEL: I thought I had 30 minutes. Do you  
11 want me to make it shorter?

12 MR. WILKINS: Go ahead. Keep moving.

13 MR. WHITESEL: Realizing that things will go the  
14 way they are, I'm going to say it all on one slide, and then  
15 I'll try and get into the details later. I'm going to give  
16 you a short overview. That's going to be the punch line.  
17 Then we're going to talk about timing, which was an issue  
18 that you had raised in your letter. I've got some remarks  
19 about the likelihood of radiological sabotage at nuclear  
20 power plants, some of the backfit rule considerations in  
21 this proposed rule, a little bit about the design basis  
22 threat and what it is today and what has been proposed, and  
23 then I don't propose to discuss any safeguards information  
24 during that time.

25 The industry's perspective on all this, some of

1 the principals that we had suggested to the staff in our  
2 letter that would provide the foundation by which we would  
3 go forward, then the schedule for whatever rulemaking takes  
4 place, and then a short summary.

5 In the overview, I'd make six points. First, the  
6 NRC is considering the changes to design basis threat in  
7 pieces. I'm sure you're aware that there is a two-phased  
8 design basis threat review in progress. Integration of  
9 those things is needed.

10 Second, the proposed changes, as you pointed out  
11 in your December letter, are not supported by analyses.  
12 Neither the regulatory analysis nor the backfit analysis  
13 provide the support that would justify this rule.

14 Third, there is no basis for linking the Three  
15 Mile Island, TMI, and World Trade Center, WTC, events, as  
16 has been done to set this up. But let's change gears.

17 We do agree that it is a good idea to keep  
18 unauthorized vehicles outside the protected area. But the  
19 issue is one of business prudence. We're concerned about  
20 employee safety. We're concerned about the protection of  
21 our generating equipment. We're concerned about the public  
22 confidence in our ability to operate these facilities. It  
23 has nothing to do at all with radiological sabotage.

24 I do believe there is common ground and the  
25 approach that we should follow is one that's based on things

1 that are realistic, that are reasonable, and we've  
2 integrated them so that once we've done it for one thing, we  
3 don't have to go back and do it for another.

4           Timing. The March 11 proposed action plan signed  
5 by the Executive Director for Operations talked about a two-  
6 phase design basis threat review. The first phase addressed  
7 land vehicle intrusion, I use LVI for short there, and  
8 design basis explosives, or DBX. And that has led to the  
9 proposed rule that was published on November 4 and to the  
10 suggestions that there be a vehicle barrier system to  
11 eliminate LVI and to render DBX ineffective.

12           The second phase, which is ongoing and my last  
13 understanding of that was it's not to be finished until  
14 sometime this year, is a general reevaluation of the design  
15 basis threat. This would speak to the makeup of the force  
16 that's considered as the threat, what sort of equipment  
17 these people would carry, what their capabilities are, and  
18 no matter how -- any way you slice it, what we're dealing  
19 with right now is a threat to one we'd characterize as  
20 paramilitary, and even Chairman Selin is on record as  
21 characterizing it in that vein.

22           So it is necessary to integrate the results of  
23 both phases of this, and this is what we said in our letter,  
24 before proposing rulemaking, so that changes that a licensee  
25 might make at his facility to deal with this issue would not

1 have to be undone or expensively modified to deal with  
2 whatever else might come out of the Phase 2 evaluation.

3 I'm going to talk a little bit about the  
4 likelihood of radiological sabotage attempts at power  
5 plants, nuclear power plants, and lead into a question. The  
6 history of these sorts of events at nuclear power plants is  
7 pretty sparse.

8 As one executive told me last fall, we were  
9 getting ready to put these comments together, "I've never  
10 needed the security force to protect the plant in all the  
11 years I've been here." The NRC's evaluations of terrorist  
12 incidents worldwide show that there have been no truck bombs  
13 directed at nuclear facilities worldwide. In this country,  
14 there have been no instances of radiological sabotage.

15 Even during Desert Storm, which is now three years  
16 ago, when the NRC suggested two security forces at the  
17 plants, that we enter a state of "heightened awareness,"  
18 there was still no such attempt. Then, barely a year ago,  
19 there was the -- let me read the phrase -- unplanned vehicle  
20 intrusion. That was an intrusion by a person with a vehicle  
21 at Three Mile Island up in Pennsylvania.

22 Followed by 19 days was the explosion at the World  
23 Trade Center. I read in the Post coming out here today  
24 where the prosecution has just rested its case in that  
25 event. And aside from the fact that they're separated by 19

1 days, we don't understand the connection. Perhaps there are  
2 things that are part of the Federal intelligence resources  
3 that we don't have access to, but we find that there is no -  
4 - at least no apparent connection between these two events.

5 In 1991, when the staff was responding to a  
6 petition to greatly increase the design basis threat, the  
7 staff said that they rated the threat of radiological  
8 sabotage at nuclear power plants as extremely low and that a  
9 change in the design basis threat at that time was  
10 unwarranted.

11 They rejected the argument that if it can happen,  
12 it will happen, and asked why would a terrorist group choose  
13 reactor sabotage over other U.S. targets. We were told back  
14 in November that while the FBI believes and continues to  
15 believe that the incidents of radiological sabotage attempts  
16 at nuclear power plants are unlikely, that they are only a  
17 little less unlikely than they were before either of those  
18 two events.

19 Now, about the backfit rule. In the regulatory  
20 analysis, the staff makes it quite clear that neither of  
21 these two events would justify a change in the definition of  
22 adequate protection. And since we're not talking about a  
23 compliance issue, the only other avenue left through the  
24 backfit rule is to demonstrate that there will be both a  
25 substantial increase in overall public protection from the

1 backfit, as well as a favorable cost-benefit balance.

2 In the regulatory analysis and backfit analysis,  
3 the staff makes assertions, but does not begin to support  
4 that with any analysis. They do talk about costs, but they  
5 don't talk about benefits.

6 MR. LEWIS: Do you think their estimates of costs  
7 are reasonable?

8 MR. WHITESEL: Yes. We've characterized the  
9 current design basis threat, the external portion of that,  
10 as paramilitary. And that's quite conservative based on the  
11 lack of any kind of paramilitary assault at a nuclear power  
12 station worldwide or in this country.

13 So we do believe that the staff's proposed change  
14 is very conservative. These are out of the proposed rule.  
15 I'm trying to be very careful to make sure I don't get into  
16 a safeguards issue here. But they indicate that there will  
17 be a vehicle located with an explosive and it will try and  
18 make a penetration. That amounts, to me, to be a moving  
19 truck bomb.

20 I believe there's been only one instance of that  
21 in the world and that was the attack on the Beirut barracks  
22 in Lebanon in 1983. In any event, it's rare.

23 The second is that the proposed size for this  
24 explosive, and that is a safeguards number and I will not  
25 mention it, is unnecessarily conservative. It is larger



1 than what we understand is the largest weapon detonated in  
2 that sort of a fashion in this country.

3 Third the idea of the proposition of the bomb and  
4 the vehicle together amounts to a suicide mission, and the  
5 NRC's own bomb threat analysis indicates that those events  
6 are extremely rare.

7 There is little recognition, at least as this rule  
8 has been proposed, though there certainly has been in past  
9 staff papers, about the defense-in-depth philosophy. Staff  
10 has long since acknowledged that radiological or reactor  
11 sabotage is technically feasible, as well they should, but  
12 that there are measures in place to protect against that.

13 As recently as last March, when Chairman Selin was  
14 responding to Senator Lieberman's requests, he talked about  
15 the reliance on sturdy structures, redundant safety systems,  
16 and damaged mitigating features that are built into the  
17 plants, for reasons quite apart from radiological sabotage  
18 considerations.

19 The industry's thoughts on this are the following,  
20 and I've alluded to a number of them. First, we agree that  
21 we ought not have unauthorized vehicles in the protected  
22 area. The second is if someone manages to park a truck bomb  
23 outside the protected area and the bomb goes off, we should  
24 be able to shut down the plant safely. Not a question about  
25 that.

1 MR. CARROLL: I think you misspoke. If they are  
2 able to park a truck bomb outside or inside?

3 MR. WHITESEL: Outside the protected area and set  
4 it off, we should be able to shut the plant down.

5 MR. CARROLL: Okay.

6 MR. WHITESEL: Employee safety, protection of our  
7 investment, that's the reliability of our generating  
8 capacity and the public confidence in our ability to operate  
9 these plants is our basis for doing this. It is not an  
10 issue of radiological sabotage.

11 We also agree, and this is the one thing the TMI  
12 event demonstrated, that what we have there now does not  
13 keep vehicles outside the protected area that really want to  
14 get in, if they are not otherwise opposed, nor were they  
15 supposed to. So we're going to have to do something to keep  
16 vehicles outside the fence.

17 This is where the common ground is. What is it  
18 that will -- what is it that will suffice?

19 MR. LEWIS: Can I raise two quick questions while  
20 you're on that same viewgraph? One is the term "suicide  
21 mission," to most of us, sounds pretty repugnant. You  
22 probably wouldn't go on one, I wouldn't go on one, although  
23 I'm getting old enough so that maybe someday I will. But  
24 the only suicide mission in this area that I know about is  
25 the Marine barracks case.

1            Yet, that illustrated the fact that there are  
2 people in the world, not sitting at this table, I think, who  
3 think of suicide in a different way than you and I do. If  
4 you're really committed to the idea that there is an  
5 afterlife in which you will be rewarded for heroism and  
6 this, more than some of us do, you're more likely to do  
7 that. I just wanted to put that on the table.

8            The second point is in talking about a bomb-laden  
9 vehicle parked more or less outside the inner fence, have  
10 you hired Red Team people, good explosive experts to do the  
11 best they can to design such a thing? Because depositing  
12 energy into the air isn't a great way to destroy a thing.  
13 There are ways to direct explosives. Have you gone through  
14 that?

15           MR. WHITESEL: Gone through the analysis of  
16 whether or not the buildings are susceptible to such a  
17 thing?

18           MR. LEWIS: Well, just putting it differently,  
19 suppose I wanted to hire someone --

20           MR. WILKINS: Hal, are you getting close to  
21 security information here?

22           MR. WHITESEL: No, I don't think so. Let me  
23 answer the question this way. We're counting on the NRC,  
24 who has got the Corps of Engineers working on those kinds of  
25 things, to help us with that.

1 MR. LEWIS: Very good. Okay.

2 MR. WHITESEL: So, no, we don't know that. We  
3 don't know that. But at the same time, if there are people  
4 using truck bombs in the world and we think we need to be  
5 protected against that, then if one goes off outside the  
6 area that we safeguard, that's a protected area fence, then  
7 we think we should be able to safely shut down.

8 MR. LEWIS: I'm only pointing out that distance is  
9 not always the great friend that we think it is.

10 MR. WHITESEL: Distance is not always the --

11 MR. LEWIS: Great friend, because it's possible to  
12 direct the force of the explosives.

13 MR. WHITESEL: I understand.

14 MR. LEWIS: Every military person --

15 MR. WHITESEL: We have not talked about that, and  
16 there are two things. Let me answer both questions with  
17 that. One is that these things are rare and those kinds of  
18 probabilities we should be cranking into --

19 MR. LEWIS: I'm not arguing the case. I only  
20 wanted to ask if you had.

21 MR. WHITESEL: So the barrier system, whatever it  
22 is, and I say system because it's possible to install  
23 ditches and soft sand and swamps and all that sort of stuff,  
24 and, in fact, some plants are built that way, that will  
25 preclude this. So I'm not trying to be specific about what

1 a barrier system would be, but it should be an industrial  
2 grade installation, not the nuclear grade installation we're  
3 used to dealing with.

4 The second is that the requirements must not allow  
5 regulation by inspection. It has got to be done in a  
6 fashion that provides -- well, either based on test data  
7 that we've gotten from Sandia or other government agencies  
8 or the State Department that has regularly done these sorts  
9 of things, not where we have to go out and do a test program  
10 and measure the square foot size or the weight of the rocks  
11 that were put up.

12 That is the sort of thing that has to be avoided  
13 without the thing getting prohibitively expensive.

14 MR. CARROLL: I'm not sure if I understand your  
15 point. You have said the Staff's estimates are reasonable  
16 for what they are --

17 MR. WHITESEL: They have a very, very large range.

18 MR. CARROLL: Yes, but do you think they are  
19 reasonable for what they are proposing to do?

20 MR. WHITESEL: It's hard to say that. They talked  
21 about a range of the costs that one might incur and there  
22 are various large differences in the length of the protected  
23 area perimeter in power plants. Whether it would range up  
24 as high as the 2.3 or 2.9 million they have talked about, I  
25 can't say but that the costs that we would expect to incur

1 for something that meets our criteria will certainly be  
2 inside their range.

3 It is not a case of them being a factor of 10 too  
4 low like has frequently been the case in the past.

5 MR. WILKINS: All right, and you are comparing now  
6 total costs, not costs per linear foot of barrier or  
7 something like that?

8 MR. WHITESEL: No, we are talking about the total  
9 cost of the installation. What we're working on are average  
10 numbers. We have an idea of what the average unprotected  
11 perimeter is and the average number of gates and those sorts  
12 of things but there is very wide variability there.

13 If this is to be carried forward, there are five I  
14 think maybe principles is a bit heavy of a word but let me  
15 use it anyhow. The design basis vehicle that we are working  
16 on and I apologize for not having these all written out but  
17 the slide gets rather cramped.

18 The design basis vehicle would be something  
19 typical of commercially available four-wheel drive vehicles,  
20 as you find in the rule, but there will be limited speeds of  
21 approach to the particular part of the fence that the  
22 adversary would choose to assault and those, and the Staff  
23 acknowledges this in the draft reg guide, can be limited  
24 quite easily by gravel, slopes, all sorts of natural terrain  
25 features.

1           The third point about the design basis vehicle is  
2           that it carries only personnel and their equipment and that  
3           the total mass of this vehicle and the maximum impact speed  
4           are limited to the numbers that you find in that safeguards  
5           enclosure.

6           MR. WILKINS: The personnel and the equipment  
7           only; then you exclude bombs.

8           MR. WHITESEL: That's right.

9           MR. WILKINS: You permit weapons, whatever they  
10          can carry --

11          MR. WHITESEL: Uzi's --

12          MR. WILKINS: Uzi's or submachine guns or  
13          something like that but not bombs?

14          MR. WHITESEL: That's right.

15          MR. LEWIS: But that case has never happened as  
16          far as I know.

17          MR. CARROLL: A couple of points. Why shouldn't  
18          they be able to carry a bomb?

19          MR. WHITESEL: Well, they might carry -- there are  
20          hand-carried explosives. I couldn't put all that on it but  
21          what is in the design basis threat right now has these  
22          people, 73.1.a, are hand-carried explosives.

23          MR. CARROLL: Why can't I have my four-wheel drive  
24          vehicle with some personnel and something other than a hand-  
25          carried bomb?

1 MR. WHITESEL: We are talking about things to be,  
2 we want things to be realistic.

3 MR. CARROLL: So that's your argument. You don't  
4 think it is realistic.

5 MR. WHITESEL: That's right. You may have a  
6 little payload capacity too. By the time you put people in  
7 this thing --

8 MR. CARROLL: Well, I'm saying I'll give up two of  
9 my allowed people and replace them with 500 pounds worth of  
10 explosives.

11 MR. WHITESEL: Well, we're saying that just  
12 doesn't make sense. If I look at 500 and some odd bomb  
13 events in the world and over 500 of them are stationary,  
14 that's the realistic piece.

15 MR. CARROLL: Okay. As far as the speed was  
16 concerned, the limitation of speed, I mean that's realism  
17 but the reason it is important is that that would eliminate  
18 whole areas of fence where you just couldn't get enough  
19 speed that you could penetrate the fence?

20 MR. WHITESEL: Or what you need to do to treat  
21 that fence is vastly reduced over one that you can come at  
22 full bore.

23 MR. CARROLL: Gotcha.

24 MR. WHITESEL: Okay. The objective of the barrier  
25 system, again undefined, is simply to stop the forward



1 motion of this vehicle in the vicinity of the protected area  
2 fence, and those are words right out of the draft reg guide  
3 but we don't want to say, like the State Department does, I  
4 have got an L-3 penetration, which means less than 3 feet,  
5 or L-12 or whatever the State Department uses to test these  
6 things because that unnecessarily raises the cost and it's  
7 not necessary.

8           The third of these, and that gets to a question  
9 that was asked just a minute ago is that the design basis  
10 exposure, if there is one, will be stationary outside the  
11 protected area and it will be of a size limited to the  
12 largest device that has been detonated in this country in  
13 this sort of a situation, and I only know of one of those,  
14 and that was at the University of Wisconsin about 20 years  
15 ago. That is still substantially smaller than what has been  
16 proposed.

17           Safe shutdown following the detonation, we talked  
18 about that before, and it will be a commercial grade design  
19 procurement installation process and a nuclear grade review  
20 and inspection is not necessary.

21           MR. CARROLL: Was the Wisconsin bomb to your  
22 knowledge smaller than the World Trade Center?

23           MR. WHITESEL: My understanding is that it is a  
24 little smaller but I think the certainty with which they  
25 have been able to peg the World Trade Center explosive is

1 not good --

2 MR. LEWIS: I think the Wisconsin one was  
3 substantially smaller. I was there at the time. It was  
4 parked right next to the so-called Math Center. It was  
5 parked within 20 feet of the hospital and it killed a  
6 physics graduate student -- which is unthinkable.

7 MR. CARROLL: I don't know about that. They may  
8 have done the world a favor.

9 MR. WILKINS: Let's not take more time --

10 MR. LEWIS: Well, the only person working at that  
11 hour of the morning was a physics graduate student.

12 MR. SHACK: Since you are going to stop the  
13 forward motion of this vehicle, why do you care whether it  
14 carries personnel and equipment or a bomb?

15 MR. WHITESEL: Because of the mass I might have to  
16 deal with. If I add all these --

17 MR. SHACK: But you are not willing to trade the  
18 same mass of a four-wheel drive vehicle and five bodies --

19 MR. WHITESEL: That is still, if you look at the  
20 safeguards enclosure, you'll see I am way ahead, that I can  
21 have whatever it is that people to conjure up for the  
22 assault force these days and that number is not something we  
23 can talk about here today.

24 MR. CARROLL: I looked at it though and he's  
25 right.

1 MR. LEWIS: But I think it is important that we  
2 not turn into amateur warriors here. The purpose of an  
3 assault force is to penetrate, so where the purpose of bomb  
4 is to explode, assault forces don't run carrying submachine  
5 guns in one arm and bombs in the other arm. You have to  
6 decide what you are trying to accomplish.

7 MR. WILKINS: Please go ahead.

8 MR. WHITESEL: With the schedule, we think the  
9 schedule that has been proposed is really quite ambitious.  
10 We think first that there should be six months --

11 MR. WILKINS: This is your proposed schedule?

12 MR. WHITESEL: Yes, and this is the one that is in  
13 our letter, that's right.

14 Six months after the issuance of the final rule,  
15 and of the plan guidance documents before licensees submit  
16 plans for these things, the first of those is what we  
17 alluded to a bit ago.

18 MR. LINDBLAD: Excuse me, Mr. Whitesel, are we  
19 talking about the final rule that combines the two issues?

20 MR. WHITESEL: Yes.

21 MR. LINDBLAD: Including the revised, the revision  
22 of the design basis threats?

23 MR. WHITESEL: Yes.

24 MR. LINDBLAD: Okay, thank you.

25 MR. WHITESEL: Because in order to do the required

1 analyses we are going to depend on blast effects studies  
2 that are currently in the possession of the Army Corps of  
3 Engineers and other groups which the NRC is fashioning into  
4 nomograms and other charts where people can go and do the  
5 complicated kind of work that has to be done looking at all  
6 the various structures.

7           Once that final guidance is out, six months is a  
8 reasonable period of time to do all those analyses, design  
9 the system and then to submit the plans. Once those have  
10 been submitted, then we need about 18 months to complete the  
11 installation and some of the factors that affect that are  
12 the site configuration itself -- some of them will be  
13 particularly difficult to deal with.

14           We are going to deal with outages because you are  
15 not going to be wanting to be building gates while you are  
16 moving people and equipment out for an outage. Material  
17 availability is another one. There are presently only a  
18 handful of people making gates of this nature right about  
19 now, and the weather. I can't tell you how many calls I got  
20 from people, especially in the upper Midwest, saying I only  
21 have from April to October to do this kind of outside work;  
22 if that schedule isn't stretched out we're going to have a  
23 hard time meeting it.

24           MR. LEWIS: We must be talking about different  
25 things because the 18 months to install, I have seen public

1 buildings sprout vehicle barriers over a weekend. They were  
2 there Monday and they weren't there Friday.

3 MR. WHITESEL: But they don't have an average of  
4 2700 feet of unprotected perimeter.

5 MR. LEWIS: No, that's correct, they don't. So  
6 this is 18 months, 2700 feet, so we are talking about 150  
7 feet a month --

8 MR. WHITESEL: -- which is five feet a day or  
9 something.

10 MR. LEWIS: Did I do my arithmetic correctly?

11 MR. WHITESEL: Well, I still have got to get  
12 through all the final design process and do the procurement  
13 and get it into the hopper for this guy's order schedule.

14 MR. LEWIS: In other words it's paper time, it's  
15 not really --

16 MR. WHITESEL: Oh, it's not erection time.

17 MR. LEWIS: Well, this says installation.

18 MR. WHITESEL: That's right, but it is leading up  
19 to it.

20 MR. LEWIS: I could install it. Yes, I'll take  
21 that contract.

22 MR. WHITESEL: We agree on keeping unauthorized  
23 vehicles outside the protected area. There isn't any  
24 question about that. But the reason for doing so has more  
25 to do with business prudence than concerns about

1 radiological sabotage.

2 The approach that is followed, whatever turns out  
3 to be the one, needs to be realistic, reasonable, and  
4 integrated with other changes that we might be making in  
5 security installations.

6 Thank you very much.

7 MR. LEWIS: Thank you very much. Does anyone want  
8 to violate our time budget by asking more questions, to put  
9 it prejudicially?

10 Are you running this, Ernest? I should be taking  
11 this over.

12 MR. WILKINS: Well, but I was going to put it even  
13 more prejudicially.

14 Bill, do you have a question? One question.

15 MR. LINDBLAD: NUMARC presumes that the second  
16 shoe to drop, the reevaluation of the design basis thread,  
17 will be at least an increase in the design basis thread, or  
18 can you conceive that if we did the design basis thread  
19 evaluation, we would be back to where we are today?

20 MR. WHITESEL: We have no presumptions. I could  
21 conceive of where once you have done the design basis for  
22 every evaluation, you would be less at what you are today  
23 because you don't have evidence of para-military attacks.

24 MR. LINDBLAD: So you wouldn't need 15-18 months  
25 to install anything?

1 MR. WHITESEL: Well, the schedule presumption is  
2 based on winning nothing.

3 MR. LINDBLAD: The worse case. Thank you.

4 MR. WILKINS: Thank you very much, Mr. Whitesel.

5 MR. WHITESEL: You are very welcome.

6 MR. WILKINS: Mr. Leventhal of the Nuclear Control  
7 Institute.

8 You might take 30 seconds or so of your valuable  
9 time and tell us just that much about the Nuclear Control  
10 Institute.

11 MR. LEVENTHAL: Thank you, Mr. Chairman.

12 My name is Paul Leventhal and I am President of  
13 the Nuclear Control Institute. We are an organization that  
14 focuses on nuclear proliferation problems.

15 One of the issues that we deal with is the  
16 question of potential for nuclear terrorism. We have been  
17 attempting for about 10 years now to get the Nuclear  
18 Regulatory Commission to upgrade the design basis threat to  
19 protect against truck bombs. We have worked in conjunction  
20 with an organization based in Los Angeles, the Committee to  
21 Bridge the Gap. We have each, some years ago, appeared  
22 before the ACRS on this question.

23 Just by way of background, before establishing the  
24 Institute in 1981, I worked on U.S. Senate Staff and was the  
25 Co-Chairman, or I should say the Co-Director with Jim

1 Asselstine of the Senate investigation of the Three Mile  
2 Island accident. I have had the opportunity to at least  
3 interact at least with some of you in that context.

4 Let me remind you that the Rasmussen Report  
5 anticipated the chain of events at TMI and considered a one-  
6 in-a-million shot. I start off on that point to simply say  
7 that the probabilistic risk assessment is of some value  
8 perhaps, but it does have its limits.

9 Surely, once the event happens, the odds go out  
10 the window and people focus on the consequences of the event  
11 and not what was anticipated beforehand as the probability  
12 that such an event would take place.

13 With regard to --

14 MR. LEWIS: Can you give me a reference for that  
15 one-in-a-million in the Rasmussen Report?

16 MR. LEVENTHAL: The Rasmussen Report -- that was  
17 my recollection of it.

18 MR. LEWIS: It is not mine.

19 MR. LEVENTHAL: Well, what was your recollection?

20 MR. LEWIS: No number, because, you know, you are  
21 talking about retrospective identification of an event which  
22 is part of a spectrum of events. It gets into the  
23 fundamentals of statistics. I think it is a bad number.  
24 But please go on.

25 MR. LEVENTHAL: Well, my recollection was that the



1 Rasmussen --

2 MR. WILKINS: Mr. Leventhal, don't get into a  
3 trap. You are about to fall into a trap. Keep going with  
4 your presentation.

5 MR. LEVENTHAL: I will keep going.

6 MR. LEWIS: It was a harmless point.

7 MR. LEVENTHAL: We can check the record on it.

8 MR. LEWIS: I don't want to let him get away with  
9 something.

10 MR. LEVENTHAL: The point I want to deal with  
11 specifically is how you assign a probabilistic risk to a  
12 suicide bombing in the United States on the basis that none  
13 has occurred to date. Before the World Trade Center  
14 bombing, there never had been a truck bomb attack of that  
15 magnitude and consequence in the United States.

16 The point was made by the NUMARC representative  
17 that only thing in common that the TMI intrusion -- and I do  
18 balk at the concept of an unplanned intrusion -- the TMI  
19 intrusion, the only connection between that and the World  
20 Trade Center event was that they both took place in  
21 February. I would quarrel with that most emphatically.

22 I would harken back to the NRC's rejection of our  
23 petition for rulemaking in which the NRC in January of '91  
24 denied our petition on the grounds that there was no  
25 credible truck bomb threat in the United States, and that if

1 such a threat materialized, licensees would receive  
2 sufficient advance warning to prevent the attack.

3           How I regard these two events is that at TMI it  
4 was demonstrated beyond a doubt that without advance warning  
5 even a dilapidated car could enter a facility during shift  
6 change and crash through the protected area fence and get  
7 within 60 feet inside the turbine building, which while not  
8 part of the protected area, was still quite close to vital  
9 systems of the plant.

10           I haven't heard an analysis if that vehicle did  
11 contain a bomb, what damage could have done to the plant. I  
12 think that is worth emphasizing. The World Trade Center  
13 event demonstrated that a truck bomb threat is credible in  
14 the United States and that there would not necessarily be  
15 advanced warning of it.

16           So I must say that I had some difficulty with your  
17 Committee's letter to the Commission and the analysis that  
18 went in that letter where you apparently feel that  
19 probabilistic risk assessment can be applied to the  
20 likelihood of a suicide bombing.

21           But you also acknowledge in your letter, as I read  
22 it, that there would be no way to know in advance of a group  
23 accumulating the amount of explosive used in the World Trade  
24 Center bomb.

25           So it would seem to me that what the record

1 demonstrates is that a truck bomb threat is credible in the  
2 United States, that a suicide bombing cannot be ruled out,  
3 particularly in response to political events, even I might  
4 add, U.S. now supporting airstrikes in response to the  
5 atrocities in Bosnia.

6 I think you are all aware that there have been two  
7 threats made by Serbian officials to attack nuclear power  
8 plants in Europe in the event of a military attack against  
9 Serbian forces. I would submit for the record the article  
10 from Nuclear Fuel which reported that, dated August 13,  
11 1992. There was also an article.

12 MR. CARROLL: We have that already, or are you  
13 leaving that with us?

14 MR. LEVENTHAL: We submitted it as part of our  
15 earlier intervention. I don't know whether this Committee  
16 has it, but I will be happy to submit it for the record.

17 There also have been reports of Serbian aircraft  
18 flying low over the Krsko Reactor in the Slovenian Republic,  
19 which, of course, is a potential target.

20 So we cannot rule out the possibility of an act of  
21 violence against a nuclear power plant. Your own letter to  
22 the NRC objecting to the rule did not assert or even explore  
23 the likelihood of the radiological consequences of a  
24 successful truck bomb attack, so I assume that that is no  
25 longer a matter of contention.

1           The Sandia Report that was done for the NRC at the  
2 time the NRC switched gears back in the 1984-'85 period, did  
3 indicate that there could be radiological consequences from  
4 a truck bomb attack. The Commission, I think, has gone on  
5 record of acknowledging that possibility.

6           So the only question in my mind is however small  
7 the probability that there would be this kind of an attack,  
8 is it worth protecting against because of the very severe  
9 consequences that could arise from that attack?

10           The consequences approach the astronomical, and  
11 the probability is very, very small of an attack that could  
12 prompt those consequences, isn't the risk, nonetheless, high  
13 enough to protect against, especially when the protection  
14 would probably cost on the order of \$1 to \$3 million per  
15 site.

16           MR. WILKINS: I can find a lot of good uses for \$1  
17 to \$3 million, if the consequences are very low. I ask you,  
18 given your involvement in Three Mile Island, do you really  
19 think that the risk of a severe accident that is going to  
20 cause public health and safety consequences is very high  
21 from one bomb at one point in the plant given the defense  
22 in-depth and the redundancy we have built into these plants?  
23 I have been around this business for about 30-years, and I  
24 honestly can't conceive of where I would place this bomb  
25 that would cause a risk to public health and safety, a

1 direct risk.

2 MR. LEVENTHAL: That is the kind of thing that you  
3 should be discussing in a classified session, and I assume  
4 that you will. I don't want to speculate on the public  
5 record how it might be done.

6 MR. LINDBLAD: Have you done the study?

7 MR. LEVENTHAL: Have we done an analysis, we have  
8 had the benefit of some of the NRC's own statements on the  
9 subject, and I will quote one.

10 MR. WILKINS: Gentlemen, we have to be very  
11 careful not to tread on --

12 MR. LEVENTHAL: I am not anxious to do that, but I  
13 wouldn't want to contemplate a situation where a large truck  
14 bomb does explode inside the protected area fence. But I  
15 would like to reserve the last bit of my time for our  
16 specific critique of the proposed rule as we now have it,  
17 and it does bear upon an issue raised in your earlier  
18 discussion with the NUMARC representative.

19 In our comments on the proposed rule, we made the  
20 point that if you are going to go to the trouble of  
21 reinforcing the protected area fence, and you are  
22 contemplating at least the possibility that the attacker  
23 will have handheld weapons, then you cannot rule out the  
24 possibility that they will bring with them a handheld weapon  
25 sufficient to blast away the barrier that you are putting up

1 to prevent entry.

2 A bazooka would be sufficient in our view to  
3 penetrate the type of barrier that has been installed at  
4 Three Mile Island, and we had the opportunity to visit that  
5 plant at the invitation of the management to demonstrate  
6 what they have put in on a voluntary basis in anticipation  
7 of the rule, but feeling a need to respond because of the  
8 intrusion.

9 What they have put up around the protected area  
10 fence is a highway guardrail of slightly heavier grade than  
11 the standard grade for highway guardrails, but that would  
12 seem to us to be insufficient protection in the face of a  
13 determined effort to breach the protected area and gain  
14 entry close enough to vital systems to cause harm to a  
15 plant.

16 We much prefer, and we have stated in our  
17 comments, heavy mass protective barriers such as a berm or  
18 an S-shaped ditch. We understand because of underground  
19 utilities that the S-shaped ditch is perhaps ont a practical  
20 solution, but we do think a berm is worth considering.  
21 I would hope that on the basis of this additional  
22 consideration of the proposed rule today that the ACRS,  
23 since it was split on the question of the opinion sent to  
24 the Commission in the first instance, would reconsider its  
25 position and support it in the interest of prudence, in the

1 interest of promoting public confidence in nuclear power.

2 This is not the kind of issue to dittle with, I  
3 think. This is an issue where, while the probability of an  
4 attack is low, it nonetheless is plausible that there could  
5 be such an attack, and if it is plausible that there could  
6 be such an attack and the protected area is inadequately  
7 protected to repel the attack, then please support the  
8 effort of the Commission to proceed in an orderly way and  
9 require utilities to install the necessary barriers.

10 I guess that is basically all that I want to say,  
11 but I would surely be happy to respond to any questions.

12 MR. LEWIS: Let me just understand one thing. So  
13 your picture of the attack that you are talking about is one  
14 in which a bomb is carried on a vehicle, and obviously it  
15 doesn't matter whether it is four-wheel drive or six-wheel  
16 drive, a bomb was carried on a vehicle, and in addition the  
17 personnel would be carrying sufficiently potent weapons to  
18 be able to blast their way through a relatively light fence,  
19 or even through a standard or slightly reinforced highway  
20 barrier. That is the picture?

21 MR. LEVENTHAL: That's correct. Let me also say  
22 in closing that we have been through this situation before  
23 where the Commission, in response to the truck bombings in  
24 Beirut, did institute a process to try to upgrade the design  
25 basis threat, and that was reversed somewhat inexplicably.

1 We would hate now to see a replay of that, and I don't think  
2 it would inure to the benefit of the NRC, or to the image  
3 and public acceptance of the nuclear industry for that to  
4 happen now.

5 We are not talking about a Draconian rule here,  
6 and it is surely a cost. We may quarrel over whether \$1 to  
7 \$3 million is a lot of money, but I don't believe there is  
8 any public utility commission that is going to reject that  
9 additional cost, particularly if it is done at the behest of  
10 the Nuclear Regulatory Commission to protect against a World  
11 Trade Center type bombing.

12 So it would seem that prudence would dictate that  
13 you support the Commission's action and not generate doubts  
14 and fears in the public mind as to whether plants will be  
15 adequately protected against that type of threat.

16 MR. WILKINS: Thank you very much, Mr. Leventhal,  
17 and I thank you also for your remaining within the time.

18 Mr. Portzline.

19 Mr. Portzline, I remind you as the rest of the  
20 speakers that we are supposed to avoid any encroachment on  
21 the area of information that is safeguards or security  
22 information.

23 MR. PORTZLINE: I'm not sure what that is.

24 MR. WILKINS: Neither am I, which is why I want to  
25 keep a really good barrier here.



1 MR. PORTZLINE: Okay. I will only refer to what  
2 has already been mentioned in other public meetings, then.

3 MR. CARROLL: Well, if it is a matter of public  
4 record, it is perfectly fine to bring it up there.

5 MR. WILKINS: I don't know if that's the theory.

6 MR. LEWIS: Really, we haven't come close.

7 MR. CARROLL: Well, even I, with the picture of  
8 the TMI was an intrusion, and we have had that up here  
9 before.

10 MR. WILKINS: Why don't you go ahead, Mr.  
11 Portzline.

12 MR. PORTZLINE: All right. I appreciate this  
13 opportunity to address this Committee. There are only three  
14 main issues I want to raise today.

15 First, I believe, the proposed rule has a serious  
16 flaw.

17 MR. WILKINS: Oh. You really need to tell us who  
18 you are, for the record here, and what your interest in this  
19 issue is.

20 MR. PORTZLINE: I'm Scott Portzline from  
21 Harrisburg, Pennsylvania, and I have been researching  
22 security matters at nuclear plants since 1984.

23 I do advise and chair a security committee, a  
24 newly-formed security committee for Three Mile Island Alert  
25 of which I am not really a member because I'm not anti-

1 nuclear.

2           There are only three main issue that I will  
3 present today. I believe the proposed rule has a serious  
4 flaw in that licensees will not be required to  
5 scientifically analyze the bomb blast effects that are site-  
6 specific.

7           The NRC guidelines for land vehicle bomb  
8 protection amounts to educated guesswork. The second point  
9 is actually a compounding of the first problem, and that is  
10 licensees will only have to confirm to the NRC that the  
11 guidelines were followed at plants where alternative  
12 measures are not proposed or deemed necessary by the  
13 licensees.

14           On what basis does the NRC believe that each  
15 licensee employ engineers who possess bomb blast expertise?  
16 On January 25, 1994, I toured the plant at the Three Mile  
17 Island and saw design deficiencies regarding barrier set-  
18 back distances. Because of vehicle barrier at the North  
19 Gate is open 50 percent of the day -- and that is GPU's own  
20 figure -- a route to vital equipment exists where no other  
21 vehicle barrier is in place to stop an approaching truck.  
22 The engineers at GPU claim that their security upgrades will  
23 meet or exceed the proposed rule.

24           [Slide.]

25           MR. PORTZLINE: This is the North Gate where the

1 intruder came through just a year ago, and the purple route  
2 is the intruder's route. You can see there are a couple of  
3 turns, and he had to slow down his vehicle quite a bit to  
4 make the turns to crash through the turbine building. Yet,  
5 he did have enough speed, even with those turns, to crash  
6 through that door. It is not a very heavy door.

7           Upon entering the North Gate, a large truck could  
8 speed along Liberty Lane, which is a long straight path,  
9 right next to the river intake system, which is a vital  
10 piece of equipment, according to the drawing that GPU showed  
11 us during our briefing.

12           It would only take 30 seconds to transverse that  
13 distance. That is about the same amount of time the  
14 intruder took. This building is also venerable to boat  
15 attacks, since this is the Susquehanna River.

16           My video presentation to the Public Works Shop  
17 showed how we approached the pump house in a large pontoon  
18 boat that was capable of hauling 6,000 pounds. It was  
19 capable of doing 40 miles an hour when it is not loaded to  
20 that degree. The Department of Defense has advised the  
21 Department of Energy reactor operators to consider their  
22 vulnerabilities, and not the intent or past actions of  
23 adversaries. My third point is that boat bomb protection is  
24 needed.

25           [Slide.]

1 MR. PORTZLINE: Continuing on this route -- this  
2 is a blowup of the protected area and here is the intake  
3 system -- follow the train tracks, and you will be within 10  
4 feet of the air intake system, which is also a vital piece  
5 of equipment according to the briefing GPU gave us. Or  
6 continue another 10 yards, and you will arrive at a vehicle  
7 barrier that blocks the entrance of the fuel handling area  
8 and handling building. The building is about 25 yards  
9 beyond the barrier.

10 Another consideration here, which I heard you  
11 discussing, is that the layout of the buildings in this  
12 position -- and they're not all drawn here; there are  
13 trailers, but there are some concrete walls, I believe, in  
14 this area. The layout of those buildings actually focus, or  
15 could actually focus, or direct a blast that made it from  
16 the barrier toward the fuel handling building, and the  
17 reactor buildings are several yards -- I shouldn't say  
18 several -- but 30 yards away from there at best.

19 A site specific analysis is needed to avoid gaps  
20 in the protection from truck bombs. But there is also some  
21 other equipment in here that is too close to the protected  
22 areas, I believe. Here is the emergency diesel generators.  
23 There is a borated water tank. There are some things in  
24 there that could be vulnerable.

25 Careful analysis is necessary because some

1 equipment housed in the turbine and other buildings were  
2 previously classified as a Type 2, Vital Equipment. The  
3 Sandia National Laboratories define Type 2 as, quote, "A  
4 vital area which radiological sabotage can be accomplished  
5 on in conjunction with additional sabotage activity in at  
6 least one other vital area," end quote.

7 A saboteur can discover what is called a companion  
8 equipment by reading publicly available documents. Of  
9 course, if one piece of equipment is already out of service,  
10 a saboteur can disable the other. A saboteur might learn of  
11 the broken equipment from an insider, and this would meet  
12 the definition of the design basis threat.

13 Additionally, in 1979, the Los Alamos Scientific  
14 Laboratory concluded that Three Mile Island Turbine building  
15 diesel generating building, the fuel handling and auxiliary  
16 buildings met the definition of a Type 1 Vital Area.

17 Too much credit is given to the classification  
18 system of vital and non-vital equipment. The elimination of  
19 the Type 2 Vital Area and the equipment classifications,  
20 which seem to change in the eye of the beholder, does not  
21 alter the real-life importance of systems that are now  
22 classified as safety or emergency systems.

23 Now, the failure to review problem.

24 [Slide.]

25 MR. PORTZLINE: To demonstrate the problems that

1 occur without a proper review and follow-up, a condition  
2 which will exist under the proposed rule, take a look at  
3 what happened to Generic Letter 8907, Power Reactor  
4 Safeguards Continuously Planning for Surface Vehicle Bombs  
5 in the case of Three Mile Island.

6           The incident investigation team report of April  
7 1993 said, quote, "The utility wrote a common procedure  
8 which was disseminated to its two nuclear facilities. At  
9 TMI, this procedure was not incorporated into any responds  
10 implementing document or manual, and was not included under  
11 the requirements of the technical specifications for review  
12 and approval and periodic review. The IIT reviewed the  
13 responsibility matrix and the TMI physical security  
14 contingency plan, and found that the site protection  
15 officers had not received guidance or training in the  
16 decisions and appropriate actions for their response. In  
17 addition, the site had not developed contingency plant  
18 procedures as required by Appendix C to 10 CFR Part 73," end  
19 quote.

20           This lack of procedure and review and the  
21 resulting vulnerabilities almost surfaced again on June 26,  
22 1993, when the Federal Bureau of Investigations raided the  
23 World Trade Center's bomber, terrorists, training camp only  
24 30 miles from Three Mile Island. Just two days before the  
25 raid, the FBI caught a second cell of terrorists in the act

1 of making multiple bombs.

2 On June 27, I call the NRC Emergency Response  
3 Center to request that TMI be required to activate the 12-  
4 hour contingency plan. At that time it was believed that  
5 the third cell of terrorists was at large. Even though my  
6 call was handled thoroughly and with utmost seriousness, and  
7 a return call from the Emergency Response Center informed me  
8 that all of the information I had presented was confirmed by  
9 the FBI in wire report, the NRC refused to err on the side  
10 of caution.

11 Security weaknesses had just been exposed at TMI,  
12 and the NRC was aware that these terrorists have threatened  
13 to attack nuclear targets with 150 suicide soldiers.  
14 Recently, I learned that the FBI never initiated any contact  
15 with the NRC or GPU about the training camp, so the claims  
16 that the industry maintains a close liaison with the FBI and  
17 the claim that the contingency plans are ready for  
18 deployment are clearly not the case.

19 If the NRC had required TMI to activate their  
20 contingency plan, then there certainly would have been a  
21 link between the terrorist bombing in New York, the training  
22 camp and Three Mile Island. Was that a motivation to not  
23 activate the plan which didn't exist anyway in the manual?

24 The Serbians have threatened to attack nuclear  
25 plants in the West if there is an intervention in the war

1 because the barriers won't be in place for more than a year  
2 and because licensees are already expressing concerns that  
3 they will not be able to meet the proposed deadline, the NRC  
4 should review each licensees contingency plan to be sure  
5 that it can be activated.

6 Without a thorough review program and a  
7 requirement for scientific analysis of the site-specific  
8 bomb blast effects, the proposed rule as it now stands may  
9 prove to only be window dressing.

10 I'm finished.

11 MR. WILKINS: Any questions of Mr. Portzline?

12 MR. CARROLL: I guess I would like to ask a  
13 similar question that I did to Mr. Leventhal.

14 It seemed from what you were saying that you  
15 translate destroying a vital building or a vital area with a  
16 direct risk to public health and safety. I think you  
17 inferred that if somebody took out the intake water  
18 structure, just leveled it, that automatically there would  
19 be a risk to public health and safety.

20 MR. PORTZLINE: No, I am inferring that  
21 automatically. However, from this area, at the barrier,  
22 remember you get there within 30 seconds. There is no  
23 barrier to stop you. You have a bunch of pieces of  
24 equipment, like the water tank. There are other equipment  
25 that I am not going to mention.



1 MR. CARROLL: But you would agree that somebody  
2 would have to do an analysis to show that that blast could  
3 affect multiple pieces of vital equipment before there would  
4 be a potential threat to public health and safety?

5 MR. PORTZLINE: Yes, and I would also point out  
6 that you should be familiar with my presentation to the  
7 public workshop, how anyone using public documents -- even a  
8 janitor can be trained to do it. Those words probably ring  
9 true for Mr. Michelson because he wrote those years ago.

10 There are enough information in the public  
11 documents that I learned an enormous amount in one week. I  
12 have a computer system and a nuclear sabotage. I get all  
13 the documents I need. I have free copies of microfiche from  
14 the State library at Harrisburg. You get an enormous  
15 education.

16 MR. CARROLL: But hopefully you have no connection  
17 with this terrorist training camp?

18 [Laughter.]

19 MR. PORTZLINE: No, I won't joke around. He  
20 jokes around.

21 MR. WILKINS: No, that is not a joking matter. So  
22 let us not joke about it.

23 MR. PORTZLINE: No.

24 MR. CARROLL: All right.

25 MR. WILKINS: Are there any further questions of

1 Mr. Portzline?

2 [No response.]

3 MR. WILKINS: All right. Thank you very much, Mr.  
4 Portzline.

5 MR. PORTZLINE: Thank you.

6 MR. WILKINS: I will not commend you for staying  
7 within your five minutes, but we had a few extra minutes, so  
8 okay.

9 MR. PORTZLINE: Thank you. I appreciate that.

10 MR. WILKINS: All right. Very good.

11 Mr. McKee, are you now going to present?

12 MR. CARROLL: Does Mr. Portzline know he needs to  
13 make copies of his slides?

14 MR. WILKINS: It would be very helpful to us if  
15 you could get to Mr. Dudley right here on my right the  
16 originals or something so we can have copies of those made?  
17 We don't want your originals, but we need to have copies  
18 made.

19 MR. CARROLL: I would also like a reference to the  
20 information you used with regard to this terrorist training  
21 camp in the vicinity of TMI? That has been in the papers?

22 MR. PORTZLINE: Oh, yes.

23 MR. CARROLL: Okay.

24 MR. WILKINS: Particularly the Harrisburg papers,  
25 I would think.

1 MR. PORTZLINE: Yes. You can also check with the  
2 Emergency Response Team who did have to contact the FBI  
3 after my phone call. All information was confirmed.

4 MR. WILKINS: All right. Mr. McKee?

5 MR. McKEE: Good afternoon. I am Phil McKee. I  
6 am the Chief of the Reactor Safeguards Branch in the Office  
7 of Nuclear Reactor Regulation.

8 One thing I note there have been a lot of  
9 discussions -- and some were in closed sessions -- with you  
10 from myself in November and also with the Subcommittee and  
11 the full Committee, and particularly the Director of the  
12 Office of NMSS spoke to you in December on several of the  
13 topics here. Some of that included some of the threat  
14 information and some are assessment information.

15 I don't plan on covering any of that. As a matter  
16 of fact, from my set presentation, I don't plan to cover  
17 anything that either classified or safeguards information.  
18 So I will stay out of that area.

19 But if we get to that approach, there are some  
20 areas where we would be prepared to go in a little more  
21 depth that might get into that area. At that time, at your  
22 choosing, we could choose to close the session and talk  
23 about that.

24 MR. LINDBLAD: Mr. McKee, I think I heard  
25 yesterday or today that in New York City the attorney for

1 the Government has closed his prosecution case on the World  
2 Trade Center Towers.

3 MR. McKEE: That is what I understand.

4 MR. LINDBLAD: In presenting his case, did he  
5 identify any information that he wasn't willing to make  
6 public before the trial?

7 MR. McKEE: I don't know. I am not familiar with  
8 all those facts.

9 MR. LINDBLAD: I see. Thank you.

10 MR. McKEE: One thing, too, I'd like to qualify  
11 the presentation. Public comments were received. The  
12 completion for the public comments was January 3rd. We, in  
13 discussions, allowed a little extension of that time for a  
14 couple of weeks for some additional comments coming in.

15 We are still in the process of combining and  
16 looking at and resolving the comments, so I am not going to  
17 get into a lot of detail on comment resolution, although I  
18 did hear a number of points here that I think I can clarify  
19 and provide information. I think you can pick up from some  
20 of the things that I have said, some of the direction or how  
21 we are looking at some of the comments.

22 Before I cover some of the general comments, I  
23 have four specific points I would like to make. The first  
24 one that I would like to cover is a common theme from many  
25 of the commentators opposed to the rulemaking is that the NRC,

1 based on the TMI intrusion event and the World Trade Center  
2 bombing, is making an impulsive decision.

3 I don't believe the regulatory history regarding  
4 this topic supports this view. The requirements for  
5 protection against the forced entry by a land vehicle were  
6 considered and now included in 10 CFR 7355 when that was  
7 first promulgated in the late 1970s.

8 Again, in the late 1980s the Commission seriously  
9 considered options that included amending the regulations to  
10 require licensees to protect against vehicle bombs.  
11 Further, on several occasions in the last several years,  
12 concerns were raised as the need for licensees to implement  
13 their vehicle contingency plan. So, they needed to  
14 implement the contingency plans or not.

15 In fact, many licensees on their own initiative  
16 took measures to protect against forced vehicle entry. The  
17 TMI intrusion event and the World Trade Center bombing were  
18 two events that provided additional data and insights to the  
19 NRC in assessing the merits for revising the design basis  
20 threat.

21 That repeats some of the points I made in our  
22 initial presentation, but I wanted to bring those out again.

23 The second point that I would like to make is that  
24 support -- the rulemaking is not necessary. NUMARC in their  
25 written comments -- and I think it was discussed here a

1 little bit today -- referred to the statement made in an NRC  
2 denial of a 1991 petition by the Nuclear Control Institute.  
3 That petition proposed that the NRC initiate rulemaking to  
4 require power reactor licensees to protect their facilities  
5 against the truck bomb.

6 While a number of the points in the NRC response  
7 supporting the denial of the petition remain true, other  
8 points and assumptions supporting the Staff's rationale for  
9 denial were seriously challenged by the World Trade Center  
10 bombing and the TMI intrusion event. Some of those were  
11 discussed earlier by Mr. Leventhal. These challenged  
12 assumptions were a major factor in the decision to proceed  
13 with the rulemaking.

14 As a third item, I would like to mention -- and  
15 this was also discussed in some of the previous discussions  
16 -- that NUMARC also refers in their comments to conclusions  
17 of the NRC Incident Investigation Team that investigated the  
18 TMI intrusion event, that some of their conclusions as  
19 germane to the rationale for not proceeding with rulemaking.

20 In particular, NUMARC refers to the IT finding  
21 that the intrusion event resulted in no actual adverse  
22 reactor safety consequences and was of minimal safety  
23 significance.

24 Also, NUMARC refers to the conclusion that the  
25 security force responded appropriately to the specific

1 challenge presented by the intruder. While these  
2 conclusions are true for this specific event, it should be  
3 noted that the Incident Investigation Team was not chartered  
4 to speculate what might have been the case if the  
5 circumstances of the event were other than what they were.

6 Staff's assessment of the IT TMI Intrusion Event  
7 Findings have found that the use of a vehicle by  
8 adversaries, if the adversaries are assumed to have the  
9 capability described in the design basis threat, could  
10 provide distinct advantages not previously considered.

11 We have -- and this is not looking at it from a  
12 bomb aspect that we are discussing -- but looking at it as  
13 if the adversaries had used a vehicle for their means of  
14 transport rather than otherwise, what advantages or what  
15 that might have provided.

16 We have some information on that, but I wouldn't  
17 want to discuss that. That would have to be discussed in a  
18 closed session.

19 As a final point, I note that the NUMARC  
20 recommendations for principles for protection against the  
21 land vehicles, although for different reasons than the NRC,  
22 are not far different from those proposed by the NRC. The  
23 major exception being that the vehicle bomb in NUMARC's  
24 recommendation is a stationary bomb rather than in a moving  
25 vehicle.

1 I am going to talk a little bit when I go through  
2 the comments. I think it will clarify some things. I heard  
3 a number of statements about the coupling of events. I have  
4 some specific comments on that that I will cover.

5 But I am going to cover that as I go through and  
6 summarize the public comments we received, and go through  
7 that. Most of those were discussed in the presentations  
8 that you heard today.

9 I think that covered the spectrum, not only in the  
10 scope of the comments, but also the various different  
11 aspects of comments in each of the areas. So, I will try  
12 not to be too repetitive in what I am doing.

13 This is just to show you the comments we received  
14 -- 32 public comment letters, many from licensees. A lot of  
15 licensees confirmed or stated they agreed with NUMARC's  
16 comments and provided some additional aspects and comments.

17 There were some private individuals and public  
18 interest groups and some industry groups. That is NUMARC,  
19 NUBARG. I think there was one private contractor that  
20 commented.

21 The total number of comments -- that is somewhat  
22 of an arbitrary. No one listed the comments one/two/three/  
23 four. We had to kind of pick and choose. From all of that,  
24 we broke it down into 164 comments. But that is more or  
25 less an arbitrary number.



1           Now, I would like to go through some of the  
2 specific topical areas. I will provide a little bit of  
3 discussion in each one of those areas. The first area -- we  
4 broke it down. This is where a substantial number of the  
5 comments came in, was in the threat. We call it the threat  
6 considerations.

7           Our first topic that we were looking at -- and I  
8 will talk about the quantitative aspects a little later  
9 because I broke that down as a separate category, was just  
10 the validity of the vehicle intrusion and the vehicle bomb  
11 threat.

12           A lot of that was discussions you heard today are  
13 more qualitative of the yes/no, based on the information we  
14 received. I think that gets somewhat into the discussion  
15 that the Director of the Office of NMSS discussed and some  
16 of our things we read in the Commission paper, the NRC  
17 assessment of those issues. There is a lot of subjectivity  
18 and qualitative assessment in those areas.

19           Now, the second topic there --

20           MR. LINDBLAD: Excuse me, Mr. McKee. Was the  
21 threat defined as penetrating boundaries, or was the threat  
22 defined as actually doing harm to the public health?

23           MR. MCKEE: The threat eventually is doing harm to  
24 the public health.

25           MR. LINDBLAD: So that is what these validity --

1 these considerations were, they were directed to what the  
2 consequences of an action --

3 MR. McKEE: That is the concern. That is really  
4 what we are protecting.

5 MR. LINDBLAD: That is what these people commented  
6 on?

7 MR. McKEE: Well, the comments were -- I can't  
8 speak for the commentators necessarily, but what I read is  
9 -- the validity would be that somebody using those devices,  
10 or a vehicle bomb or intrusion would use that device to  
11 cause damage to endanger the public health and safety.

12 MR. LINDBLAD: Yes. I can accept much easier the  
13 threat of an intrusion than I can the threat of damage to  
14 the public health and safety. But thank you.

15 MR. McKEE: First, on coupling, if you will bear  
16 with me, I want go over this fairly closely. A number of  
17 commentators, including NUMARC, expressed concerns with the  
18 linking or the coupling of the TMI intrusion and World Trade  
19 Center bombing events.

20 Specific concerns were expressed that the proposed  
21 rule implies that the intruding vehicle would be fully  
22 loaded with personnel, equipment, and a large explosive  
23 device.

24 The proposed rule was not intended to require  
25 protecting against an intrusion by adversaries using a

1 vehicle for transportation coincident with a vehicle bomb.  
2 To clarify this point may require a change to the rule  
3 language.

4 I would like to add that the liberations on the  
5 rule considered use of the vehicle as a transportation for  
6 an adversary, and a vehicle to transport a bomb as separate  
7 threats to be protected against.

8 Any coupling associated with the rule was intended  
9 to be related to implementation measures. Coupling of the  
10 implementation measures was, in turn, intended to allow for  
11 a more efficient and cost effective protective approach  
12 against both types of threats.

13 Another aspect of NUMARC's concern regarding  
14 coupling is the assumption that the explosive device is  
15 considered to be carried in a moving vehicle. This concern  
16 is being specifically considered in response to comments.  
17 So that is one aspect we are looking at and intend to  
18 resolve.

19 The next item was characteristics of the design  
20 basis vehicle and explosive. I won't get into that. You  
21 heard some of the comments. There are some comments that  
22 indicated that the explosives should be less. There are  
23 comments that we should consider -- and you heard it from  
24 Mr. Leventhal -- of use of a device that could damage the  
25 barrier and then go through the barrier. So, we have gotten

1 a spectrum of comments in that area and are looking at that.

2 There are also comments that maybe now there is a  
3 vehicle and the use the adversaries, that should we consider  
4 that the adversaries have more than hand-carried equipment.  
5 That was another aspect. But there is a variance at that.  
6 We are looking at those items.

7 I think an important one here -- and I would shed  
8 some light on the integration with the design basis threat  
9 reevaluation as brought up -- and again brought up here  
10 today. The concern about integration, might we make  
11 decisions later on in Phase II which looks more broadly at  
12 other threat considerations, number of adversaries, what  
13 they might carry, per se.

14 If we make the decision now in the vehicle  
15 barriers, consideration on that later could impact and cause  
16 inefficiency where the people may have to do more than if we  
17 wait until later to resolve the whole issue.

18 I think that issue will essentially resolve  
19 itself. It appears that we are heading on a pretty good  
20 track, I can say. The comments are getting to a point in  
21 Phase II. I think they should be close to resolution, so  
22 the integration issue should not be a significant issue  
23 here.

24 I think what they are looking at in Phase II  
25 really is not looking at the vehicle aspects, but it is

1 looking at other aspects.

2 There was another comment, a rather interesting  
3 conflict -- and I am surprised it wasn't brought up today  
4 -- is that there is proposed a conflict with the proposed  
5 threat in 10 CFR Part 5013. It was indicated that the  
6 threat that we are proposing the vehicle bomb and the  
7 intrusion by adversaries using a vehicle, really equates to  
8 an attack by an enemy of the United States.

9 If you go through 5013 there is a specific clause  
10 in there that excludes licensees from needing to protect  
11 against attacks directed against a facility by an enemy of  
12 the United States. We are looking at it from a legal  
13 aspect. It is an interesting question that came up.

14 Into the next area, although I have a couple of  
15 bullets here, it is an important area. The backfit  
16 analysis. As you have heard -- and I heard NUMAKC say that  
17 our backfit analysis was inadequate, most of that -- and I  
18 think some of the ACRS comments that you provided, the  
19 letter that you sent -- really focused on the quantifying  
20 threat.

21 Emphasis was on the threat itself. You have heard  
22 some discussion of that. We are looking at some of the  
23 regulatory history in that area. As was mentioned on the  
24 one side, it is not an easy task to look in that area.  
25 There is a question on validity in quantifying that. But we

1 are looking at that in the resolution of our comments.

2 But there is another aspect that was discussed  
3 here and I might enter into it a little bit is what are the  
4 conditional probabilities, or the consequences of what might  
5 happen, given the threat? That is one area that we are  
6 trying to look at and possibly expand our regulatory  
7 analysis, to look at consequences for two things.

8 The focus seems to be on vehicle bombs. We are  
9 looking at that more specifically, what might be the  
10 consequences in considering redundancy and other things of  
11 equipment of vehicle bomb blasts, in the design basis device  
12 basis.

13 MR. WILKINS: Excuse me. Consequences to the  
14 public health and safety, you are talking about?

15 MR. MCKEE: That's right. Consequences, looking  
16 at a blast of that size, what could that do to the plant  
17 which, in turn, would lead to the potential consequences of  
18 the public health and safety.

19 The other aspect is the conditional basis or  
20 probabilities of advantages of adversaries using a vehicle  
21 versus not using a vehicle. We are trying to explore some  
22 of those areas. Hopefully we will be able to provide a  
23 little more light, a little more foundation in our  
24 regulatory analysis in that area.

25 A comment was made in this area -- and it is

1 somewhat repetitive here -- about the consideration of  
2 redundant safeguard systems. I have heard, and it is very  
3 true -- and that has been an argument -- there are a lot of  
4 redundancies of systems -- not even among dual systems --  
5 but between systems where you can have back-up.

6 That is something we frequently look at in some of  
7 the other efforts that we do in the safeguards area and give  
8 credit for that. We are also looking at this in its -- that  
9 comment was not quite true. It said we didn't do any of  
10 that.

11 It can be a very important factor -- and if you  
12 look through the Reg Guide and the process we allow, once  
13 you damage your equipment and assess that damage, it allows  
14 for consideration of redundancy: Do you have back-up  
15 equipment or mitigating equipment that could allow for the  
16 plant to safely shut down? So it is a factor we have  
17 considered.

18 MR. LINDBLAD: Are you including the Reg Guide as  
19 a regulation in that regard?

20 MR. McKEE: It is guidance. That is what a Reg  
21 Guide is. It is part of the guidance and one method that  
22 licensees can use to meet the regulation.

23 MR. LINDBLAD: So, no, you don't treat the Reg  
24 Guide as being the only way to do that?

25 MR. McKEE: That is never how a Reg Guide is used.

1 MR. LINDBLAD: Thank you.

2 MR. McKEE: I couldn't say.

3 [Laughter.]

4 MR. McKEE: I was in the Office of Standards  
5 Development a long time ago. I am familiar with that topic.

6 MR. WILKINS: Please continue.

7 MR. McKEE: So, I think the redundant systems are  
8 considered.

9 The last area -- and we really didn't that many  
10 comments, well other than the first topic in this area, and  
11 that gets into some of the Reg Guide aspects, which gets  
12 into the implementation -- but as was mentioned, I won't go  
13 into the schedule.

14 Now I am talking about the licensee schedule that  
15 was proposed in the rule, proposed 90 days for submittal of  
16 a summary of the measures that would be taken, the  
17 comparative analysis facility-protected, or in the case that  
18 was necessary, alternative approaches.

19 As was mentioned, industry almost unanimously  
20 indicated that this may not be enough time, and from the  
21 licensees comments, we are proposing that that 90 days shall  
22 go to 180 days to allow for appropriate developing of that  
23 information, doing that design.

24 Also, for the implementation rather than the year,  
25 looking for a year from the effective date of the rule,



1 revising that to 18 months. We are looking at the factors  
2 that were brought up supporting that and deciding how we  
3 might proceed in that area.

4 We also had some comments in another area for NRC  
5 review and approval of licensee submittal, as currently  
6 constructed in the proposed rule where you have a summary  
7 description sent in that doesn't state specifically that the  
8 NRC will review and approve that. The review and approval  
9 is focused a lot towards any alternative measures, although  
10 we do plan -- and there was a comment in the inspection. We  
11 will probably inspect and follow up on that.

12 We were looking at that as how we might process  
13 and look at this material that comes in, and if necessary,  
14 make any revisions to our regulations, or the Reg Guide.

15 Another area is qualification of vehicle barriers.  
16 I should add in there I meant that as a general -- as  
17 qualification of the barriers, the information for that, and  
18 also how to proceed with the blast effects analysis, or the  
19 effects of a blast.

20 There was a comment and it was discussed here that  
21 to applying nuclear grade. I am still looking to make sure  
22 that I understand that term. You know, we certainly want  
23 the barriers, if constructed, to be done correctly.

24 We have done a lot of security programs and  
25 security equipment doesn't fall under the explicit

1 requirements of Appendix B. I would think in this case we  
2 will look and see how we can apply that so that there aren't  
3 unnecessary, unreasonable measures done, but that it is done  
4 correctly.

5           So we are looking at that aspect to make sure that  
6 that point is clear on the quality and what kind of checks  
7 are needed.

8           Also, as fairly mentioned, the Reg Guide provides  
9 a good process and provides ideas for design of barriers and  
10 also a process for doing a blast effects analysis. We are  
11 developing a NUREG guide. That is another piece that we  
12 still have to do to provide some additional detail in that  
13 area, that we think will make the job for doing it a lot  
14 better and easier for licensees to do in doing that for  
15 qualifying, also for providing barriers, and also for  
16 completing their analysis.

17           The last item on there -- and that finishes most  
18 of the topical areas we got comments on -- is the  
19 alternative measures. I know there are a lot of discussions  
20 in this area. I think my original presentation is our  
21 expectation, based on how we go through that in placing  
22 barriers close to or around, which we expect would be the  
23 case in the protected area, although we are not locked into  
24 that.

25           We think that very few, if possibly any, will need

1 to proceed with the alternative protective measures, that it  
2 can be done under the current process. Hopefully, with our  
3 NUREG guidance in there, that will help support that.

4 But given that, we got comments in both areas. If  
5 a licensee would choose, or would have to go to the  
6 alternative protective measures, we got comments to the  
7 effect that that would be very difficult. We are asking  
8 licensees to do something that the NRC had done in their  
9 analysis.

10 There was also some comments that we haven't asked  
11 licensees to go far enough, that we should require an  
12 equivalent. So, we are trying to judge that and see how we  
13 might characterize that better so that that process would be  
14 fair and complete.

15 Just the last item that I want to cover -- those  
16 are the topical areas -- is the NRC schedule. As I  
17 mentioned, we are working to respond to the public comments.  
18 We still have a lot of work to be done.

19 There are two areas where I see it that we have a  
20 considerable amount of work. One is upgrading or looking at  
21 our regulatory analysis in some of the areas of the  
22 conditional probabilities or probabilities of some of the  
23 consequences. I think we need to do some more work in that  
24 area.

25 We are proceeding in that area for both the

1 vehicle bomb and a comparison of the intrusion use of a  
2 vehicle for transportation of adversaries.

3 The other area where a lot of work remains is in  
4 completing our NUREG document to provide assistance for  
5 barriers design and considerations of speed and how that  
6 might be done, and also for doing the analysis of blast  
7 effects.

8 Once that is out, that will provide a more  
9 simplified implementation guide. I think that is a key in  
10 my mind.

11 A lot of work remains. We still officially have  
12 some steps to go through as far as going to a CRGR. Our  
13 current due date for submission of the rule making package  
14 to the Commission is sometime at the end of February.  
15 Recognizing that it is the end of February, and what I see  
16 has to be done, I think that is very optimistic and will be  
17 a difficult schedule to make.

18 We are seeking and looking for possibly extending  
19 that time frame several weeks. We haven't gotten word back,  
20 but that is where we are headed.

21 So with that, that completes what I had planned to  
22 talk to you about this afternoon.

23 MR. WILKINS: Any questions for Mr. McKee? Mr.  
24 Lindblad?

25 MR. LINDBLAD: Mr. McKee, do I recall correctly

1 that Part 73 requires the licensee to assume an insider  
2 threat concurrently with a penetration?

3 MR. McKEE: Yes, it says with external with the  
4 assistance of an insider on the external aspect.

5 MR. LINDBLAD: One insider, one individual?

6 MR. McKEE: I don't know that it specifies that  
7 but yes.

8 MR. LINDBLAD: Do the new requirements require the  
9 licensee to have a system that would forestall intrusion  
10 with the aid of an insider? Can one insider open the gate  
11 is I guess what I am saying?

12 MR. McKEE: Well, in that whole area of how an  
13 insider may be used or applied, it's been fairly subjective  
14 on how that it done.

15 MR. LINDBLAD: I remember that.

16 MR. McKEE: And I wouldn't think that we would  
17 apply it in the context that you were saying, that they  
18 could open a gate or do something of that nature. A lot of  
19 times in looking at the insider we look at assistance and  
20 for the external threat the adversaries to have certain  
21 knowledge of facilities and locations within the plant.  
22 That seems to be a more reasonable approach.

23 MR. LINDBLAD: I guess my question is will the  
24 gates require a two-man opening, a two-person open --

25 MR. McKEE: I don't think the rule or the reg

1 guide specifically addresses that. Now that you have  
2 mentioned it we'll have to look at that.

3 MR. LINDBLAD: Thank you.

4 MR. WILKINS: Dr. Lewis.

5 MR. LEWIS: I have two things. One is simply a  
6 statement which you needn't reply to and that is that I am a  
7 little concerned about a process in which we are assigning  
8 extraordinary explosive sophistication to an attacking  
9 group, along with enormous goal-oriented stupidity because I  
10 worry about motives. I know people who want to do damage to  
11 the United States -- heaven knows, I know that -- and if I  
12 were so motivated I'm not sure that I would take a  
13 paramilitary force and attack a hard target in order to do  
14 it, because the cases we know just don't include that.  
15 That's just a statement. It doesn't call for an answer. We  
16 simply have different views.

17 So I'm going to ask a question about the rule.  
18 The rule says in several places that the protection against  
19 a vehicle bomb has to be consistent with design goals and  
20 criteria specified by the Commission. These have not been  
21 written or have been written?

22 MR. McKEE: The design goals and criteria we tried  
23 to -- that's addressed in more detail in the reg guide but  
24 in essence that is also speaking to the device size and to  
25 protect the facility and the vehicle characteristics.

1 MR. LEWIS: Okay. I expected that you would  
2 answer that by referring to the reg guide but you also  
3 answered Mr. Lindblad by saying the reg guide was not a  
4 rule, that it was what a reg guide is.

5 MR. McKEE: Right but I also mentioned in my  
6 response that it refers to the device, you know, a device  
7 size and a vehicle characteristics which have been provided  
8 separately outside of the --

9 MR. LEWIS: But the proposed rule, as I have it  
10 here, says that a licensee must confirm that he has met the  
11 design goals and criteria.

12 What document will he look at in order to find out  
13 what these criteria are that he is going to have to meet?

14 MR. McKEE: Do you have a comment, Bob? Bob Dube  
15 from my staff wants to comment here.

16 MR. DUBE: Dr. Lewis, following issuance of the  
17 rule, obviously we weren't able in a public document to  
18 identify what the design --

19 MR. LEWIS: But they do exist in writing?

20 MR. DUBE: What we did was we sent a generic  
21 letter out -- that's probably not the right word because  
22 that is a specific term -- we sent a letter out from  
23 Projects within NRR to all of the licensees identifying the  
24 design basis vehicle characteristics.

25 That was sent out independent of the regulatory

1 guide. Subsequently we sent out a regulatory guide that  
2 included a safeguards information addendum and that  
3 safeguards information addendum included in it the same  
4 material that we had previously sent out but we did that as  
5 the --

6 MR. LEWIS: I am trying to separate the rule from  
7 the reg guide. The reg guide, as we have all agreed, is not  
8 mandatory so if I am a licensee trying to conform to this  
9 rule, if this rule goes into effect, I should not look at  
10 the reg guide presumably but I should look at the generic  
11 letter?

12 MR. DUBE: You should look -- generic letter was a  
13 bad phrase. We sent a letter to all licensees that  
14 identified the characteristics of design basis.

15 MR. LEWIS: If I have a rule I have to be very  
16 specific about what I have to comply with. What is it that I  
17 have to comply with, the generic letter?

18 MR. DUBE: You have to comply with the rule and  
19 the letter that was sent to all licensees defines the  
20 characteristics that we weren't able to publish in the  
21 rules.

22 MR. LEWIS: Okay, that is what is referred to in  
23 this rule as the design goals and criteria specified by the  
24 Commission. It's that letter?

25 MR. DUBE: Yes.



1 MR. LEWIS: Do we have a copy of that letter?

2 MR. DUBE: I don't know whether you have a copy of  
3 that letter.

4 MR. LEWIS: I see, so we do not know what this  
5 rule means at this point? Is that correct?

6 MR. DUBE: I don't recall whether we provided you  
7 with it.

8 MR. LEWIS: I see. I was not here during the  
9 briefings.

10 MR. WILKINS: In any case, it is not in the  
11 package that we have now because this package is all  
12 unclassified.

13 MR. DUBE: Right.

14 MR. LEWIS: But we're not talking classification.  
15 We're talking about safeguards.

16 MR. CARROLL: What was it that I read? It was a  
17 document that described a whole bunch of things and then had  
18 a classified appendix.

19 MR. McKEE: Safeguards appendix.

20 MR. CARROLL: Or safeguards appendix.

21 MR. McKEE: That was one of the Commission papers.

22 MR. CARROLL: What was that called? This was a  
23 couple of months ago.

24 MR. McKEE: The Commission's SECY.

25 MR. LEWIS: I am really, you know, aiming at a

1 related but slightly further point. A rule that refers to  
2 design criteria had better have criteria and those criteria  
3 have to be unambiguous if you are going to make it into a  
4 rule. I haven't seen them so I don't know. they may be  
5 unambiguous but it is sort of a conversational vacuum  
6 unless you have them.

7           The second point is that the rule in the body of  
8 the rule says that the licensee shall, as one option,  
9 confirm to the Commission that the vehicle control measures  
10 meet the design goals and criteria specified. These are the  
11 things we have been talking about, but in the preamble it  
12 says that the protection must be consistent with the design  
13 goals and criteria and then it says licensees whose vehicle  
14 control measures -- and it doesn't spell "control" correctly  
15 -- do not fully satisfy the design goals. The word "fully"  
16 is a pretty powerful word and I don't know what the  
17 definition of the word "fully" means in this case.

18           First of all, I don't think you "satisfy" goals;  
19 you meet goals, you don't satisfy them, but leaving that  
20 aside, the discrepancy between confirming that you have met  
21 the goals and confirming that you have fully met the goals  
22 leaves an awful lot of discretion and ambiguity in the  
23 proposed rule and I am sort of left not knowing how that is  
24 going to be, how it is planned to enforce that.

25           I think that one should either put the "fully"

1 into the rule and then say what you mean by by fully, or  
2 leave it out of the preamble to the rule and be clear about  
3 what it is that you are proposing to impose on the  
4 licensees.

5 I've already stated my view that this is -- that I  
6 do, despite what my good friend Paul Leventhal has said, I  
7 do think you are going a little far but we'll have a  
8 committee debate about that, but I think that that specific  
9 point of specificity is extremely important in a rule and I  
10 would like to see the letter that describes what you mean by  
11 the design goals and criteria specified to the Commission to  
12 see that it is explicit and that people know what the law is  
13 that they are required to obey. That is a general principle  
14 of English law.

15 MR. WILKINS: Did that document go out in the last  
16 one month, six months, one year?

17 MR. CARROLL: The one I am referring to is maybe  
18 three months old.

19 MR. WILKINS: Is that what you gentlemen are  
20 talking about?

21 MR. DUBE: No, it's older than that. We sent it  
22 out roughly a month or so after -- maybe even earlier than  
23 that.

24 MR. MCKEE: It's been available in several  
25 different formats. It was part of a Commission paper but it

1 was also sent out to licensees in a separate correspondence  
2 along, after the rule was published --

3 MR. WILKINS: All you are doing is adding fire to  
4 the, pouring oil on the fire that Dr. Lewis is trying to put  
5 up.

6 Is there a document that the NRC has sent to  
7 licensees that tells them what these design goals and  
8 criteria are? That is the document we want to see, not  
9 anything else, not preliminary drafts of it, not versions  
10 that were turned down by the Commission or anything else.  
11 What is the document that went out? Is it a generic letter?  
12 Is it an information notice? What date was on it? Did it  
13 require a response? All those good things.

14 MR. McKEE: We will provide you with that, that  
15 correspondence.

16 MR. WILKINS: When you do that, that will quiet  
17 all these -- well, I don't know whether it will quiet me.  
18 It may raise some other concerns but it will at least quiet  
19 these concerns.

20 MR. LEWIS: At least tell us what we are talking  
21 about, which we have not yet found out.

22 MR. LINDBLAD: Yes.

23 MR. WILKINS: Thank you very much, Mr. McKee. Now  
24 does the committee wish to discuss this at this time or  
25 should we defer this? We're supposed to be on a break right

1 now.

2 MR. LINDBLAD: Yes, just in committee discussion,  
3 at the beginning of this session I had to remind myself why  
4 were we having this meeting, and I have gone through the  
5 papers that the Staff engineer has prepared for us, and  
6 getting down to the bottom it seems to be that we  
7 specifically wanted to hear the NUMARC comments in order to  
8 consider whether we had an opinion on the NUMARC comments.

9 I would, of all the things here, I'd kind of like  
10 to be sure that we on the Committee have asked NUMARC all  
11 the explicatory things that we might want to do because that  
12 is what our assignment is.

13 MR. LEWIS: I would add the NCI comments also.

14 MR. WILKINS: Well, we have the benefit of the NCI  
15 and also Mr. Portzline's comments on what NUMARC said, and I  
16 think that is helpful to us and we also have Mr. McKee's.

17 MR. LEWIS: And the Commission is interested in  
18 our views.

19 MR. WILKINS: Yes, on that, there is no question  
20 about that, so NUMARC is still here, is it not? Yes, Mr.  
21 Whitesel is right behind me, so are there any questions any  
22 members of the committee wish to address to him in light of  
23 everything that we have heard during his presentation and  
24 since his presentation?

25 MR. LINDBLAD: Yes, Mr. Whitesel. Could you take

1 a microphone for a minute?

2 It is my understanding that the people you  
3 represent view security from a number of areas, some of  
4 which are directly regulated by the NRC and some of which  
5 are not. Some of them have to do with vandalism and  
6 industrial damage that might be done to the plant.

7 We have taken the NRC Staff to task a few times  
8 about -- let me paraphrase it -- and these are, excuse me,  
9 my words, not the committee's words. My words might be  
10 don't tell me what some people think you ought to do. Tell  
11 me if we really have changed the threat to the public health  
12 and safety by what we are thinking about.

13 They have had to do a little toe dance, I think,  
14 in respect to that type of answer. Yet I see in your  
15 proposal that your utilities recognize a need to satisfy a  
16 perception in the public's eyes that there is a elevated  
17 risk and you are willing to do something to respond to that.

18 Did I get that from one of your slides?

19 MR. WHITESEL: I'm not sure it is appropriate to  
20 say we see there is an elevated risk but we do see that --

21 MR. LINDBLAD: No, I'm sorry, that there's a  
22 perception that there is an elevated risk, a public  
23 perception.

24 MR. WHITESEL: I'm not sure how to address that.  
25 The issue has to do with the unplanned intrusion or whatever

1 you want to call Pierce Nye's intrusion into the TMI plant  
2 is not in our best interest to have happen again on the  
3 basis of our concern for the safety of our employees, the  
4 investment we have in that generating equipment and public  
5 confidence.

6 MR. LINDBLAD: Public confidence I guess -- is  
7 that maybe what you are talking about when you say  
8 perception?

9 MR. WHITESEL: The equation I was trying to draw,  
10 I drew public confidence to equate to something about a  
11 concern for how people viewed risk.

12 MR. LINDBLAD: That's right.

13 MR. WHITESEL: A part of that has to do with the  
14 things you heard here earlier and that is there are people  
15 in the general public who think that just because I can  
16 crash a car through the protected area fence that I have  
17 really placed the plant at risk, which is not true.

18 Some very preliminary analyses of what might have  
19 happened at TMI had Mr. Nye had a fairly large explosive in  
20 his vehicle or nothing from a radiological consequence  
21 standpoint, but you can't expect large segments of the  
22 general public to comprehend that because they don't know  
23 plant design that well.

24 MR. LINDBLAD: Yes, but as I understand your  
25 position it seems to suggest, like we perhaps have or like I

1 perhaps posited a minute ago, that the regulatory authority  
2 shouldn't tell you about things like that. It should leave  
3 it up to the utility to respond to public perceptions.

4 MR. WHITESEL: We think that prudence is the  
5 province of the utility and if there is not a radiological  
6 sabotage issue then it is not an NRC responsibility and  
7 Chairman Selin has said as much.

8 MR. CARROLL: Chairman Selin has what?

9 MR. WHITESEL: Chairman Selin has said as much,  
10 that the industrial safety of the power plant and what might  
11 happen to employees in the parking lot is not his direct  
12 concern from the Atomic Energy Act. That belongs to the  
13 utility.

14 MR. WILKINS: Thank you. Dr. Lewis?

15 MR. LEWIS: It's a question that really relates to  
16 the things that Mr. Whitesel said and that Paul Leventhal  
17 said, therefore I'll ask the question of Mr McKee.

18 Everyo..e has referred to the general point that in  
19 order to promulgate the rule the NRC, me, you, have agreed  
20 that it is not necessary to provide adequate safety and  
21 therefore it falls under the provisions of the backfit rule,  
22 and that in order to satisfy the backfit rule you have to  
23 establish that it provides a substantial increase in the  
24 public health and safety. I guess the backfit rule is  
25 loosely worded. It doesn't say it should deal with the



1 prevention of a substantial decrease, which is really what  
2 your point is in terms of the World Trade Center bombing,  
3 but that you have to provide a substantial increase and show  
4 that it is cost beneficial.

5 I think your position, and correct me if I am  
6 wrong, has been that nobody can quantify these things and we  
7 are just confident that the threat to the public health and  
8 safety was increased by this new evidence and therefore  
9 since in the safeguards area has always been very difficult  
10 to quantify the costs and benefits that one shouldn't start  
11 applying it at this time. If I am misstating your position,  
12 correct me, but you do not plan then to make new efforts to  
13 try to quantify the increase in public health and safety  
14 that would be called substantial, or to judge the benefits,  
15 not the costs, which NUMARC has agreed are reasonably  
16 contained within your limits.

17 Is that a fair statement of the situation?

18 MR. MCKEE: Well, I think, as I mentioned, as far  
19 as quantification of the threat itself, and I know our other  
20 office really looks at the threat, I think what you have  
21 said is we still are finding the difficulty in doing that.  
22 I mentioned we are looking at some of the aspects of the  
23 consequence. I think we are looking at that part of the  
24 equation. I think it's there and if you don't have that,  
25 as far as I know the regulatory analysis to come up with a

1 benefit aspect you really need a quantitative basis to lead  
2 you --

3 MR. LEWIS: NUMARC -- let me just have one  
4 sentence. NUMARC has made the statement -- I may have the  
5 words wrong -- that your treatment of this subject is  
6 entirely declaratory. Is that a fair statement? I'm sorry  
7 to interrupt you. I just want to finish this point, Jay.

8 MR. McKEE: It's more of a qualitative assessment  
9 as far as the threat basis.

10 MR. LEWIS: I think that is the same thought in  
11 slightly different words. I'm sorry, Jay.

12 MR. CARROLL: All I wanted to say is no, a PRA  
13 could be very powerful on this.

14 MR. LEWIS: That's certainly my view.

15 MR. CARROLL: If you could establish that for the  
16 typical plant or for the population of plants that there is  
17 no single vehicular bomb that can cause a radiological  
18 release in and of itself, the concern to public health and  
19 safety problem is gone.

20 MR. LEWIS: Yes. You are going beyond what I  
21 want. I just wanted to establish where the different  
22 positions were on these two sides and then we will have to  
23 at some point either reaffirm or reconsider our committee  
24 position.

25 Our committee position in the last letter stated

1 explicitly that one can do this and if we want to retract  
2 that, which is what we are asked to do by Paul Leventhal, or  
3 not retract it, which we were asked to do by NUMARC, that's  
4 our business.

5 MR. CARROLL: But even if there is some  
6 probability of this, if it is sufficiently low and you say,  
7 okay, I'll even grant that there is 100 percent probability  
8 within the next year that a suicide bomb is going to go  
9 through the fence of every nuclear plant in the country, you  
10 know something. You know something you didn't know before.

11 MR. LEWIS: And I don't know what the Serbian  
12 artillery men are going to do when they can't shell  
13 Sarajevo.

14 MR. WILKINS: I don't even know that they will  
15 stop shelling Sarajevo.

16 MR. LEWIS: Yes.

17 MR. CARROLL: We didn't even consider in all of  
18 this worldwide stuff the fact that we have had an aerial  
19 attack on a nuclear facility. The Israelis took out one  
20 without any worldwide consequences.

21 MR. LEWIS: Yes. there is a little less  
22 protection.

23 MR. WILKINS: Any further comments, gentlemen? If  
24 not, I would like to thank all of our speakers -- Mr.  
25 Leventhal?

1 MR. LEVENTHAL: I would just like to add something  
2 for the record, if I could.

3 MR. WILKINS: Can you hold it to 60 seconds?

4 MR. LEVENTHAL: Even less.

5 I am referring to the study that was done by the  
6 Sandia National Laboratory and the study itself was  
7 classified but there was a non-classified summary of it in  
8 the Weekly Information Report of the NRC, April 20th, 1984.

9 I quote: "The results of the Sandia study, the  
10 results show that unacceptable damage to vital reactor  
11 systems could occur from a relatively small charge at close  
12 distances and also from larger but still reasonable size  
13 charges at large set-back distances (greater than the  
14 protected area for most plants)."

15 Now I would urge you to go back to that Sandia  
16 study and I would also urge you to read Chairman Selin's  
17 testimony before the Lieberman Subcommittee where he said  
18 that the Commission had analyzed the intrusion at TMI and  
19 could not rule out the possibility of radiological  
20 consequences if Pierre Nye's car had contained a bomb.

21 I think these have a direct bearing on the  
22 question that you are considering right here.

23 My own sense of it is that there is no question  
24 that if redundant safety systems were disrupted by the blast  
25 effect that there could be serious radiological consequences

1 resulting from a truck bomb attack.

2 MR. LEWIS: I don't remember you believe all the  
3 Senate witnesses when you were over there.

4 MR. CARROLL: For the record I would like to state  
5 that I have read the classified version in very close detail  
6 of the Sandia report.

7 MR. WILKINS: And no further comment, all right.

8 MR. LEWIS: I think Paul's point is well taken  
9 that we should look back at the Sandia study.

10 MR. CARROLL: Yes, you should.

11 MR. LEVENTHAL: And also the basis for Chairman  
12 Selin's testimony.

13 MR. WILKINS: We'll let Mr. Portzline have a final  
14 30 seconds and then we are going to recess.

15 MR. PORTZLINE: Take a look at what happened at  
16 the French Phoenix breeder reactor with the small anti-tank  
17 ordinance and rocket-propelled grenades, so you cannot rule  
18 out that type of assault; two of them even blast away the  
19 barriers.

20 MR. WILKINS: All right. Thank you all, gentlemen  
21 and I guess there were no ladies who spoke but we thank the  
22 ladies who listened.

23 We'll recess and reconvene at 4:20.

24 [Recess.]

25 MR. WILKINS: Let's go on the record.

1 MR. CATTON: Can I say something quick? At lunch  
2 time tomorrow somebody is coming over to talk to us about  
3 earthquakes, and I guess anybody who wants should --

4 MR. WILKINS: About the particular earthquake?

5 MR. CATTON: About the particular earthquake, and  
6 the meaning of some of this data.

7 MR. WILKINS: At noon, or whenever?

8 MR. CATTON: Our lunch time.

9 MR. WILKINS: Our lunch time.

10 MR. INGE: It is going to be at Room 422 at 11:45.

11 MR. CATTON: There you have it.

12 MR. WILKINS: It may or may not be at our lunch  
13 time.

14 MR. CATTON: That's right. I had asked John to  
15 find somebody who can talk to us a little bit about the  
16 earthquake, and particularly the surprises.

17 MR. WILKINS: Okay.

18 The agenda item now is the discussion of the  
19 proposed NRC staff plan to implement the recommendations of  
20 the PRA working group and the regulatory review group. The  
21 subcommittee chairman is Dr. Lewis, and I turn the meeting  
22 over to you.

23 MR. LEWIS: Thank you, Mr. Chairman.

24 I have a problem because, among other things, I  
25 have here viewgraphs that Mr. Thadani used in briefing the

1 Commission and he traces the history of this subject back to  
2 1979, and I have in front of me a statement by the  
3 Commission in 1979 saying that they are forced into this by  
4 the report of what they call the Lewis Group in 1979.  
5 Therefore, I suppose I have to disqualify myself from  
6 presiding over this. Is that true?

7 MR. WILKINS: No.

8 MR. LEWIS: I see.

9 MR. WILKINS: The Chair absolves you of all  
10 liability for reporting your usual errors in 1979.

11 MR. LEWIS: It simply confirms what some people  
12 believe that early sins stick with you. But I have nothing  
13 to say. We have talked about this subject before, so it  
14 requires no introduction. So who is taking it, Ashok is  
15 taking it, take it.

16 MR. WILKINS: Ashok, let me just ask a ministerial  
17 type question, how long do you plan?

18 MR. THADANI: My guess is 25-30 minutes.

19 MR. WILKINS: Is there anyone else who is going  
20 to --

21 MR. CATTON: While he is getting his microphone  
22 on, I think I would like to on the record congratulate Ashok  
23 for his promotion.

24 MR. WILKINS: Very good. I think all of us are  
25 very pleased that the Commission has recognized your talents

1 and capabilities and has rewarded them appropriately.

2 MR. THADANI: Thank you very much.

3 MR. WILKINS: My introductory remarks refer both  
4 to PRA and the regulatory review group, but I gather you are  
5 going to talk about PRA?

6 MR. THADANI: Yes. The last time I was here, I  
7 basically said we were going to develop a plan, and Hal  
8 Lewis correctly noted it was a plan of a plan, and you are  
9 right. I indicated then that we were going to take a number  
10 of recommendations. Certainly Mark Cunningham at the time  
11 briefed you about PRA Working Group recommendations. You  
12 have seen the Regulatory Review Group recommendations and,  
13 in fact, there are activities and issues that even go beyond  
14 those two specific sites or recommendations.

15 When I was here last and talked about a plan of a  
16 plan, I remember Hal Lewis said that there was a bit of a  
17 glow here, and you hoped that it was going to stay that way.  
18 I hoped so too.

19 In your letter, you were quite correct. In your  
20 letter you noted that this was not going to be a simple  
21 task, that the staff would probably need more time to put  
22 together a true implementation plan for these techniques  
23 and, again, I agree with you, you are right, and it is  
24 taking us longer and I will tell you some of the activities  
25 that are going on now and when we hope to get there.



1           So basically, today I will try and cover these  
2 elements very briefly, tell you where we are. You have been  
3 briefed on the Reg Review Group recommendations, the PRA  
4 Working Group recommendations. I do want to take a couple  
5 of minutes and really expand on our interactions with the  
6 industry, in this case NUMARC, the Regulatory Threshold  
7 Working Group.

8           It seems to me that their objectives parallel  
9 ours. They have the same goal essentially to expand  
10 applications of PRA in agency activities in a number of  
11 different areas. They are working on a number of issues,  
12 actually they are developing some thoughts on a number of  
13 areas. I think that would be very helpful to us as we go  
14 forward.

15           They are looking at things like, should one use  
16 relative values? For what applications do you use relative  
17 values, or when is it appropriate to use absolute  
18 probabilistic estimates?

19           What does one do when one wants to rank issues  
20 versus when one needs to make a go/no-go decision? What are  
21 the decision criteria one has to come up with? I mean even  
22 examples of temporary actions versus permanent actions.  
23 These are real issues that the licensees face, and what  
24 criteria would they use for those kinds of activities.

25           There is a lot of what appears to be a lot of good

1 thinking going on, at least on the part of NUMARC, and they  
2 have a fairly substantial working group consisting of a  
3 number of people from the industry. I don't have the list  
4 of names with me, but I know most of them and I think they  
5 are very good. So I think this interaction is important to  
6 us, and we have had a meeting recently, last week as a  
7 matter of fact, and I thought that was a very good start at  
8 trying to understand their thinking.

9 Now the next issue is, we have talked enough about  
10 generalities, now what we want to do is to take specific  
11 topics, topic by topic to go through. For example, decision  
12 criteria, our next meeting, I think it is next month, is  
13 going to be focused only on that aspect.

14 MR. LEWIS: Before you go much further, you know  
15 many of these are not subjects that are specific to the  
16 nuclear business, they are not specific to the particular  
17 issues you have. There are books written on statistical  
18 decision theory, there are even some people who have read  
19 those books -- maybe more should, maybe more shouldn't --  
20 but it is not a new subject.

21 MR. THADANI: No, it is not a new subject. I will  
22 come back to it.

23 What you find is -- well, for some decisions you  
24 really don't have to do a lot of work. You don't have to go  
25 into debt and spend lots of resources when you could

1 probably come up with some reasonable approximate approaches  
2 to make those decisions. I think it is important to  
3 understand what decision you are trying to make, and then  
4 say what information base you need to develop to be able to  
5 make that decision.

6 It is that aspect, development of that information  
7 base that goes with that specific application, that is  
8 important, and I think both sides need to understand what  
9 that is. Those are the kinds of issues. That is what I  
10 mean, you have to get to the next level now.

11 I am want to go into Credit QA, for example, take  
12 Appendix B and take the Q List. That is an example where we  
13 have already gone ahead. There is an issue raised by the  
14 Reg Review Group. There are, in fact, two working groups,  
15 the industry and our working group, working on it. The  
16 question is, what is the demarcation point?

17 It seems to me you need one level of information  
18 for that decision, and if you are making some much  
19 simpler -- I say simpler -- if I have to change, let's say,  
20 the frequency of testing of something, that is a different  
21 type of decision, and the information base that I need for  
22 that I think is different. In fact, I will come back to  
23 this issue.

24 Why I suspect it is taking us longer, and it is  
25 going to take a substantial time, substantial in this case

1 is several months, to actually do this is because we need to  
2 identify, I think, specific activities, and then say, what  
3 is the objective, and then develop a whole set of  
4 information to see what commonalities there may be in terms  
5 of information or what decision criteria are needed, and so  
6 on.

7 Hopefully it will develop --

8 MR. LEWIS: You can always start with diesel  
9 generators.

10 MR. THADANI: I want to start with success.

11 [Laughter.]

12 MR. THADANI: This to me is very important, and we  
13 are giving a lot of priority to our interactions with this  
14 working group and, in fact, this working group from  
15 industry's side interacts with other industry working groups  
16 if, in fact, since we are trying to encourage use of PRA  
17 techniques, we are encouraging this threshold working group  
18 to get involved in other activities of the industry also so  
19 that there is a common thread as we go forward, and it is  
20 not choppy or inconsistent. So this working group is, in  
21 fact, involved, and not just the Appendix B Working Group  
22 but some others as well.

23 MR. DAVIS: Ashok, I notice on that slide you have  
24 PSA. Is there a distinction within the agency?

25 MR. THADANI: You know, it is interesting. PSA, I

1 will give you my explanation and you might get something  
2 different from other people. When I say PSA, if I were to  
3 say PSA, I would generally be focusing mostly on what we  
4 would call Level 1 and Level 2 type of analyses. There will  
5 be situations, and if you go to a regulatory review group  
6 report, their recommendation was to focus in on core damage  
7 frequency as one key way to make decisions. I personally  
8 think that is not sufficient, but we will go forward and see  
9 where we end up.

10 People who use the term probabilistic safety  
11 analysis I think kind of limit it that way. I use  
12 probabilistic risk assessment to really go all the way  
13 through to Level 3, and that doesn't mean you have to do  
14 that every time. I think, again, application should drive  
15 what you are doing rather than laying out straight the  
16 criteria.

17 This viewgraph and the next one that I will put up  
18 basically, I think, hopefully will give you an idea of the  
19 breadth of activities where we are planning to apply  
20 probabilistic techniques to help us make decisions, and to  
21 help us decide what kind of resources should go where.

22 These applications, as you can see here, range all  
23 the way from what I would call very thorough extensive  
24 application, for example advanced reactor reviews, to  
25 something much less extensive, perhaps a small license

1 amendment that came in where we used this kind of an  
2 approach.

3           The other aspect of this list and the next page is  
4 that you will note that it is not limited to program  
5 offices. It is not just NRR, AEOD, Research, NMSS, it is  
6 everybody in the agency, all the regions. I will share with  
7 you, when we first started this, we sent letters to all the  
8 regions and told them about what we were thinking and  
9 solicited their views and input, and this reflects that.

10           I am happy to say, to support. I think again I  
11 will say, as I did last time, I think the time is right.  
12 There is a lot of interest, even at the regions, to go  
13 forward with this kind of thinking.

14           We have now a lot of the IPEs, and we have a lot  
15 of insights for various risk studies, and I think given  
16 that, we ought to be able to do a lot more than we are doing  
17 today, for example, in the area of inspections, technical  
18 specifications and, in fact, looking at some of the  
19 regulations. Appendix J is a very good example. I have  
20 used this before because I happen to believe that what we  
21 are doing is right. Appendix J has requirements for  
22 integrated testing of the containment, and that is very  
23 expensive and there is some frequency.

24           You sit back and ask yourself questions like, is  
25 that frequency the right frequency? How does it impact

1 risk? Is there a better way to do this? It seems to us one  
2 can actually do just as well and probably cut down on, I  
3 think, the tremendous cost of these tests.

4 MR. LINDBLAD: Do you have some other examples,  
5 Ashok?

6 MR. THADANI: Yes. I mentioned Appendix B. Down  
7 the road we will, of course, be looking at Appendix R also.

8 MR. LINDBLAD: How about Eastern United States  
9 seismic?

10 MR. THADANI: Well, it wasn't on my mind, but we  
11 can take a look and see what it means. I don't know enough  
12 to be able to react.

13 MR. SEALE: You may be getting more help than you  
14 want in the sense that I read the anticipated activities of  
15 the DRAP and ORAP plans as having a very heavy PRA impact.

16 MR. THADANI: Yes.

17 MR. SEALE: I don't see that anywhere on your  
18 list.

19 MR. THADANI: You see it in the advance reactor  
20 abuse, for example. I say that we are not going to go much  
21 beyond what we are doing. In some areas, I said we won't do  
22 much more than what we are doing now. Advance reactor  
23 abuse, for example, we are looking at the PRA up-front and  
24 looking at design, and I don't want to overstate it because  
25 I am not sure it is really optimization, but at least

1 careful consideration of PRA at the design stage, and  
2 looking at some alternatives, we looked at these results in  
3 the context of safety goals, as you correctly noted, DRAP,  
4 ORAP, ITAACs, we have a lot of insights from the PRA that we  
5 folded into our reviewers and said, "Make sure you consider  
6 these in terms of ITAACs also."

7 I don't think we need to go any further. We have  
8 done enough, but that is one end, and then there is the  
9 other end where we have done very little. So I think I used  
10 the example of inspections, but that could apply to a number  
11 of other areas where I think we can do more, particularly  
12 because we have the IPEs. That is very important, we have  
13 plant specific models.

14 I won't go through the details of this, but what  
15 do you really learn from this. It seems to me the key  
16 things are, some of this Mark said at the meeting that he  
17 had with you last time, and I want to reemphasize, I think  
18 the degree to which these techniques will be used will  
19 really depend on the staff expertise, and I think that is  
20 the key, and understanding what you can and cannot do with  
21 what you have in front of you. I mean it sounds very  
22 simple, but I think in this area, I think the agency has  
23 some pockets of expertise, and I think that is going to be  
24 an issue that would require a lot of attention on our part.

25 The other part that is very critical and that is



1 the availability of regulatory guidance, methods. We just  
2 talked a lot about decision criteria. I mean, does one need  
3 a standard review plan, or something like that as one goes  
4 forward. If we really want to implement it, make it down  
5 the road common practice within the agency, there needs to  
6 be clear guidance, clear understanding of expectations and  
7 so on, and the reviewers then would have to have the right  
8 tools in addition to knowledge and so on.

9           Some of the implications of this approach  
10 obviously are that in some cases I think we will need more  
11 information on IPES. If you recall Generic Letter 88-20 and  
12 what we asked the industry to provide us, it may not be  
13 enough. If you go and want to develop importance measures,  
14 and so on, you need information that is generally not  
15 provided.

16           So we are working, again, with NUMARC to try and  
17 make sure we develop and understand what information needs  
18 there would be, and I think the other part that seems to us  
19 is almost evident even at this stage is that I think we  
20 would need more staff competent in this technology. That is  
21 what I think, and when I talked to the Commission I said,  
22 that is my opinion. We will wait and see how it comes out  
23 when we really get the plan together and identify resources  
24 and schedules and so on.

25           This is the other page that I referred to. But I

1 want to use an example to illustrate what I think the scope  
2 of this needs to be.

3 [Slide.]

4 MR. THADANI: I used this when we briefed the  
5 Commission on January 31, and particularly focused in -- I  
6 wanted to make a point that we are not talking just to  
7 program offices. A whole range of regional activities, I  
8 think, can really, really be more effective if those  
9 activities fold in thinking in terms of safety significance  
10 of what we're doing, both in preplanning and then, so to  
11 speak, post-implementation.

12 For example -- let me give you some back-up  
13 viewgraphs. I just want to make a point. I will come back  
14 to this.

15 [Slide.]

16 MR. THADANI: With IPEs, it seems to us, that we  
17 should be able to when we go in plan an inspection. We  
18 should really look through to see what the IPEs are telling  
19 us what is really important for that specific plant. So,  
20 make sure people -- when you are going to an inspection, you  
21 have an IPE, there are some things you can do before you  
22 start your inspection. Then when you have finished your  
23 inspection and you've got your findings, you know, Level I,  
24 II, III deviations, et cetera, then it seems really  
25 essential that we put that information in terms of: how

1 important was it, what did we find? I mean, there are 20  
2 findings, maybe one of them is the only one that really is  
3 real significant.

4           Having these plan-specific tools, we ought to be  
5 able to take the next step and prioritize, put it in terms  
6 of important. I'm not going to go through the details, but  
7 the only point I want to make here is having these models,  
8 one can pick a system for inspection; you can actually do  
9 sequence post-inspection. You can do it a number of  
10 different ways.

11           Go in prepared with some information base, and  
12 know what is really important. That is what you want to  
13 look at. Once you get some understanding of what is  
14 important, and you've done your inspection, then you should  
15 really take that information and their techniques and things  
16 you can do to say, okay, how important really is that issue,  
17 how does it impact the safety of that plant?

18           You can use these tools then to, hopefully, say,  
19 10 percent of the issues are really important; that is where  
20 you ought to focus your attention on. I think, as you know,  
21 we are looking at reduced inspection resources down the year  
22 -- I mean, you've probably seen some of the numbers.

23           So I think we have to get smarter about where we  
24 spend those resources and how we spend them, and I think  
25 this is an approach that could be used. This is the kind of

1 stuff we are putting together in this plan that we are  
2 talking about. All these activities where PRA in sites and  
3 IPE in sites would be very helpful.

4 Now, I just used inspections. There is no reason  
5 to stop there. I mean, when we do -- when plants have  
6 problems and they call in and they say they want to continue  
7 to operate for X days. Limiting condition of operations,  
8 tech specs say you've got to shut down. Well, sometimes we  
9 are now -- shutting down may be, in fact, the wrong thing to  
10 do. Sometimes.

11 There is no reason why we can't take -- we have  
12 models -- we can't the information, try to understand the  
13 safety significance in this context. When I speak that  
14 there is no reason why we can't, this implied in my  
15 statement is the factor that we are confident that the model  
16 we have is fairly good. I am not implying that you don't  
17 look at the model itself and just run with the results. I  
18 think you need to develop some level of confidence with  
19 that, but you can apply it: continued operation and  
20 justification, enforcement discretion activities. I mean,  
21 this is exactly what I think we ought to do.

22 What is even more important is that the regions  
23 are very supportive of this. Us sitting here saying it is  
24 not enough. I think they're supportive. Every region got  
25 back to me excited about this kind of thinking.

1 [Slide.]

2 MR. THADANI: So, now having talked about -- what  
3 I just showed you were categories. Within each category we  
4 have activities, and we have developed a fairly long list of  
5 activities. Now, it is very important -- this can get out  
6 of hand if we are not careful. We could be planning for a  
7 long time, so what we thought we'd better do for each  
8 activity is to develop certain information.

9 Some of these activities are interrelated, and we  
10 need to understand those interrelationships so that when we  
11 starting developing information base, it is done in some  
12 reasonably efficient manner. We are not doing the same  
13 thing five different ways.

14 So what we have done for each activity, we are  
15 trying to develop this level of information. What are we  
16 doing today and where are we going, what is it that we want  
17 to do next, what approach would be used to get there? Are  
18 we going to be in the review mode or the analysis mode, or  
19 what is it that we are going to do as an Agency, and what  
20 criteria do we need to be able to do that job? What  
21 knowledge and skills are needed to be able to do that job?  
22 Are we revising regulatory guides, standard review plans, or  
23 are we changing our regulations? What is it that needs to  
24 be changed? We need to identify that. Of course, we need  
25 to also indicate what kind of tools and data would be needed

1 to be able to do this kind of thing.

2           Extremely important, I think, is organizational  
3 responsibility. I think we are trying to lay out up front  
4 what it is that we are going to do and who is responsible  
5 for doing that. Then we are going to attach the schedules,  
6 resources, and once we identify that and all the offices --  
7 each office will be responsible for implementing whatever  
8 they are responsible for. But we will then go back, and if  
9 it seems appropriate, which I suspect it is going to be --  
10 that's my view again -- we will have to go back and devise a  
11 5-year plan because there needs to be a clear commitment on  
12 what we are doing and what it will take to get there.

13           Now, that's why it is important to go through  
14 this. If there are disagreements, we will have enough  
15 information to see what the options might be.

16           [Slide.]

17           MR. THADANI: I have sort of covered this, but let  
18 me pick up on some of the points. I've indicated that we  
19 have actually done a reasonable amount of work and have  
20 identified the activities. We are not done because as we go  
21 we are identifying some new issues that we are kind of  
22 folding in.

23           But as we go forward, there are certain things we  
24 have to do, we need to do because we want to get as much  
25 input from other sources as we can. I talked about NUMARC -

1 - no. We want to make sure that we continually interface  
2 with the ACRS. If you have any suggestions, ideas,  
3 recommendations, this is a good time as we develop this  
4 plan.

5 [Slide.]

6 MR. THADANI: Now, you have heard me talk an awful  
7 lot about NUMARC, and I just said that we want to get ACRS  
8 input, and I will come back to this point.

9 We also want to solicit input from public, and I  
10 will come back to one approach that we think is a reasonable  
11 way to go. So, let's say we put this list of activities  
12 together, and all the offices will get together and make  
13 sure that these are properly prioritized and coordinated  
14 because on a number of these activities more than one office  
15 will be involved, and sometimes regions will be involved, so  
16 we have to make sure that we go through and have a clear  
17 understanding of who is doing what when.

18 We hope to have a fairly good activities list, as  
19 well as scheduled resources along the lines I described  
20 earlier. At this point, each office would sit down and try  
21 to come to grips with this whole issue and see what can or  
22 cannot be done, and each office will be asked to develop an  
23 operating plan. Then that operating plan will be reflected  
24 in the revised five-year plan.

25 Now, as we go forward -- and as Hal mentioned

1 quite correctly, I think, it was after Hal's report on the  
2 Reactor Safety Study, the Commission issued a statement. I  
3 was right. It was January '79. I don't think there was  
4 anything technically wrong with the policy statement. It  
5 was the way it was perceived. There were some things in it  
6 that were perceived in a negative way. So the outcome  
7 seemed to be that, "I've never heard of PRA; don't tell me  
8 about PRA; I don't use PRA in my activities." The reaction  
9 was negative. I think that was an overreaction.

10 We have made a great deal of progress since then  
11 of improvement methods. We have a lot more data and we have  
12 actually a pretty good list where we have applied these  
13 techniques. The Commission severe accident policy statement  
14 and the safety goal policy statement I think are a  
15 reflection that really we can depend on PRAs more and more  
16 in terms of what we do. But as far as probablistic risk  
17 assessment is concerned, this policy statement on record is  
18 the one of January 1979.

19 So we have recommended, and I didn't get negative  
20 feedback from the Commission, so I'm assuming that they're  
21 not against it, that we go out with a policy statement, and  
22 the purpose of the policy statement would be just what it  
23 says, that it is our commitment to really increase the use  
24 of these methods and all our activities where it's  
25 appropriate.



1           We should identify, I think, in this policy  
2 statement areas where we're going to go forward. We should  
3 in this policy statement encourage the industry to move in  
4 this direction. I'm not sure they need any more  
5 encouragement, but I think it would be a good idea. And to  
6 encourage the industry to keep up with the IPEs and the  
7 IPEEEs so that they can in fact be used all the way through  
8 in what I would call risk management activities.

9           Another reason for wanting to go out with a policy  
10 statement will be I think this is a big step forward, and it  
11 would also offer the public an opportunity to provide us  
12 with their views on what they think about what we're about  
13 to do.

14           Now, what we are hoping to do is we are hoping to  
15 have a draft policy statement put together this month, and  
16 I'm briefly describing to you what I think will be in it.

17           We have had one or two drafts, but nothing that's  
18 in very good shape, I don't think. What we want to do is to  
19 have a draft that we can get out in a couple of months for  
20 public comment, and we will, of course, pass the draft to you  
21 and solicit your views and comments.

22           The view basically is let's try and see if we  
23 can't finalize this Commission's policy statement in about  
24 six or eight months, and that would be then the policy  
25 statement on record.

1           Now, I think you were right on the mark in your  
2 letter that it was going to take time and it is taking time,  
3 as you can see. But one of the things we're very sensitive  
4 to is that we not -- just because we spend time developing  
5 these plants, that we not use that as a reason not to go  
6 forward on some issues of some importance and priorities.

7           So this is just a list of activities. We're going  
8 ahead. And I think in a way this is good, because we will,  
9 in all major applications, we will use pilot studies to make  
10 sure we really understand the implications of what we're  
11 doing, and these are some examples of that.

12           So we're going ahead, and as we go forward,  
13 nuances develop and you begin to understand that you've got  
14 to consider this and that. So I think this is a good idea.  
15 Even though we haven't got the plan in place, it doesn't  
16 matter; we're going ahead. We're also looking at  
17 techniques, PRA techniques, how they can be applied in terms  
18 of the Appendix B issue as well as other activities.

19           By the way, I don't know if you're familiar.  
20 South Texas -- just digressing basically -- came in  
21 proposing to modify 15 or 20 technical specifications.  
22 South Texas is a three-crane design plant and they wanted to  
23 take advantage of that, and it took us longer than maybe it  
24 should have, but nevertheless, I think we're there. We're  
25 approving most of what they've said with some

1 recommendations on staggered testing of some support  
2 systems. But that's an excellent example, I think, that the  
3 Commission -- the staff -- the staff is ready, I think, to  
4 go forward, which is very important, and that safety  
5 evaluation report is in fact -- if it's not out, it's about  
6 to get out.

7 I won't go through the next chart, which I think  
8 you already know that we are -- we're applying these  
9 techniques today, so it's -- but I think we are taking a  
10 quantum step in this case as we go forward.

11 That's the status. I hope to have, as I said, a  
12 draft policy statement that we can pass out and try to get  
13 some feedback on, and I am not sure a meeting would be  
14 necessary, but you can decide that as you see fit. But we  
15 would like to get your thoughts, and if you want to identify  
16 someone we can get the draft to to get that feedback, it  
17 would be very helpful to us, and any other recommendations,  
18 thoughts, because I think this is the time.

19 MR. LEWIS: I think there are many people who have  
20 questions, so let me preempt by asking one.

21 I have a problem that one often sees in this  
22 situation in which you know where you are now and you know  
23 where you want to be, but there is no way to walk from here  
24 to there, there are no intermediate steps, and I worry a  
25 little bit about the discrete individual office authority in

1 doing this in their own way, and you spoke of some things  
2 which require interaction between the offices and which they  
3 will coordinate, but generally speaking the offices are  
4 going to, as I understand it, going to be taking their  
5 responsibility.

6 I have this picture, and part of the problem in  
7 one of our earlier letters that we wrote the Commission on  
8 this subject is that there is such unevenness within the  
9 agency and the sophistication with which people do this kind  
10 of thing, and I have this picture of a field full of  
11 airplanes and people learning to fly and learning on the job  
12 and some fly pretty well, some don't fly pretty well, the  
13 sky is full of airplanes, and God only knows. It would be  
14 chaotic, and yet you can't have a sort of agency-wide  
15 training program that sort of declares everybody an expert  
16 on PRA.

17 So one solution that some organizations adopt and  
18 which we actually recommended in one of our letters is to  
19 give up a little bit of the vertical organization of the  
20 agency in turn for a little bit of matrix organization, a  
21 little bit of horizontality, and in particular we did  
22 recommend early on that there be formed -- the few good  
23 statisticians of the crowd be brought together as a kind of  
24 review team, perhaps not with authority, but at least so  
25 that things that are written by the less well educated parts

1 of the agency that involve the use of PRA sort of pass  
2 through some kind of quality control measure. I notice that  
3 was missing.

4 MR. THADANI: Maybe i should have said it. I  
5 didn't. I thin the paper that went up to the Commission, we  
6 did say that for those major applications, we would keep the  
7 PRA working group together and we would use them as kind of  
8 checkers, so to speak, but not everything, because that  
9 would just -- you know, that's a classical way to slow  
10 everything down. So you have to be careful as to how much  
11 of that you do.

12 That group is still intact and the purpose of that  
13 is for the major office activities, this group provides sort  
14 of focal --

15 MR. LEWIS: I think the original letter was -- I  
16 can't interpret it becuase it's illegal in our world, but it  
17 really contemplated a not-so-high level, but expert group to  
18 provide, you know, the same way that people should pass  
19 metallurgical stuff through metallurgists; in other words, a  
20 little bit of horizontal organization.

21 MR. THADANI: Yes.

22 MR. LEWIS: And without that, I worry about the  
23 unevenness persisting and consisting to give PRA a bad name  
24 when it's misused.

25 I recently got a videotape of this speech I gave

1 at Oak Ridge about six months ago, and it shows me standing  
2 on the podium yelling at this audience, and I'm appalled  
3 that we're still arguing about whether people should use PRA  
4 in nuclear regulation. That's completely crazy. And I  
5 could see it happening again if the negative reactions that  
6 you correctly referred to from right after our report were  
7 to happen again because people misuse it. I think avoiding  
8 misuse is more important than --

9 MR. THADANI; I agree. I absolutely agree.

10 MR. LEWIS: Okay. That's a comment. It doesn't  
11 --

12 MR. THADANI: And we're listening. I think this  
13 will be carefully considered.

14 MR. LEWIS: You gave the right answer; you said I  
15 agree. So now I can turn to other people. It's on the  
16 record.

17 MR. CARROLL: Just to follow up on what you're  
18 talking about, in our package, Dean thoughtfully provided us  
19 on page 24 with the INPO letter about the problem of this  
20 out in this industry, and, you know, it is a scary letter,  
21 that people could have fallen into the trap that they did.  
22 I mentioned that letter as required reading in a meeting or  
23 two ago. It's right in front of you if you haven't read it  
24 yet. But it really goes to the point that Ashok and Hal are  
25 both talking about.

1 MR. SEALE: Along that line, one of the things  
2 INPO has learned in their implementation of training  
3 programs is the desirability of using pilot plants to  
4 validate a process before you impregnate the whole  
5 organization with the product.

6 You said you don't have a lot of expertise. It  
7 seems to me that's going to be one of your problems, and  
8 you're probably going to have to do it by teaching some old  
9 dogs some new tricks, and even if you don't, you can't go  
10 out and hire people who are PRA experts off the street.  
11 That's a culture that does have some arcane specifics to it.

12 About three months ago or so, Ed Jordan was down  
13 here and talked about AEOD's plans for training at the  
14 center. Are they proceeding with that and do they plan to  
15 pilot plan any of that stuff any time soon?

16 MR. THADANI: They are proceeding with that, as  
17 you notice, in every activity we had a piece that said  
18 training.

19 MR. SEALE: In one activity, yes.

20 MR. THADANI: No, no. For each activity we have  
21 to identify what training, and AEOD has actually gone ahead  
22 with -- Ed Jordan, as you know, is a strong supporter of  
23 going forward in this area. I think they are pretty far  
24 ahead and moving ahead. What we have to do, all the offices  
25 have to identify the need, but training has to support the

1 agency.

2 MR. SEALE: Yes.

3 MR. THADANI: But going back to what you said, and  
4 I agree with you fully, any big applications where we  
5 haven't done it before, pilots are good, and that is what we  
6 are trying to do. What we're doing is we are working with  
7 NUMARC to identify those pilot studies.

8 I mentioned Appendix B as an example.

9 MR. CARROLL: I remember the piloting of Primer in  
10 PRA too.

11 MR. THADANI: Oh, that's true. I see. The other  
12 thing I would like to say. Sometimes -- let me put this  
13 delicately because there are different views. People  
14 confuse that when you do a probabalistic risk assessment --  
15 I mean statistics is a very important part of that, but I  
16 think much more important of that is the basic element of  
17 understanding the plant; you must understand the plant.  
18 Numbers are useless if you don't know how the plant behaves  
19 and operates. You must understand that.

20 So basic understand of systems behavior, accident  
21 analysis, training analysis, some of the severe accident  
22 responses, containment performance, I think is fundamental  
23 depending on what level of study you're talking about. I  
24 want to be sure that we don't understate the important of  
25 that.



1           Over laid on that, you must not -- I mean, if  
2 event trees are wrong, it doesn't do any good to quantify  
3 them. It doesn't do any good. So we've got to keep that in  
4 mind for the talent that we talk about is -- you know, you  
5 need someone with statistics background, but you need  
6 someone who has this very broad and good understanding of  
7 plant operation and design. That's a tough thing to do.

8           MR. SEALE: And that's why it ought to be the add  
9 on, rather than --

10          MR. THADANI: Right.

11          MR. CARROLL: The classic example in my mind is  
12 the draft that Sandia fell into on 1150 on Surry. The guys  
13 who knew how to crunch the numbers --

14          MR. THADANI: The Father of 1150 said he has a  
15 comment. Or should I say grandfather.

16          [Laughter.]

17          MR. LEWIS: Let me speak in defense of numbers  
18 there. They are good things, but I think just as many  
19 mistakes have been made by leaving them out as putting them  
20 in. But that's just the point I was making at the  
21 beginning; you've got to do the whole thing together, and  
22 you've got to do both parts of it pretty well.

23          MR. THADANI: Yes.

24          MR. LEWIS: The attitude that if you understand  
25 the plant, putting in the numbers is a piece of cake is

1 wrong.

2 MR. CARROLL: Oh, no. No.

3 MR. LEWIS: It is a sophisticated business. It  
4 requires good work.

5 MR. CARROLL: Yes.

6 MR. LEWIS: Pete, you wanted to say something. I  
7 think you had your hand up.

8 MR. DAVIS: I think I have been preempted by some  
9 other comments, but I will go ahead any way. It will take  
10 me just a brief moment.

11 It seems to me, Ashok, that one potential concern  
12 is that you are going to be relying quite heavily, it sounds  
13 like, on the IPE results. I will have to confess that the  
14 IPEs I've seen so far as of quite good quality; however, it  
15 could be that your reliance on the IPEs is inconsistent with  
16 the review that the Agency plans to put the IPEs through in  
17 that it is more or less an audit-type review rather than an  
18 in-depth review to make sure that the models and assumptions  
19 are correct.

20 It is possible that an incorrect PRA could mislead  
21 you. We have examples where two PRAs have been done on the  
22 same plan, and came to rather different conclusions about  
23 what was important, and the risk profile was different for  
24 the two PRAs.

25 MR. THADANI: Yes.

1           MR. DAVIS: And I know you know that. It just  
2 occurred to me that perhaps the IPE review is really not  
3 geared to qualify the results to the extent that is  
4 necessary for your use of that.

5           MR. THADANI: I think that is a legitimate  
6 question. We have to focus on that. Again, I want to make  
7 sure that, you know, the reviews we do and other things, I  
8 think they need to be driven by how we are going to use  
9 these things, where are we going to use them, and that  
10 should drive the review.

11           You are right. In some cases, our reviews have  
12 not been a fair amount of depth that maybe one needs to  
13 have, but if you don't mind, I will withhold making comment  
14 on that until we decide what do we really want to do with  
15 all these things, and then I think one question we have to  
16 address is -- two -- what kind of review are we going to do,  
17 and what kind of information do we need.

18           I think the two are very important because we  
19 don't necessarily have a -- I mean, I can see some  
20 applications where it might impact licensees to generate  
21 more information. They may not even have it on site, for  
22 some applications. But we will wait and see. Those are the  
23 things.

24           By the way, we are talking to NUMARC about things  
25 like that, information needs for those applications.

1 MR. KRESS: Ashok, in your presentation you didn't  
2 talk a great deal about uncertainties. A PRA is pretty much  
3 incomplete without knowing how the variances are and the  
4 uncertainties are.

5 Do you have a plan for how you are going to -- you  
6 know, it is not quite practical to say you are going to take  
7 a PRA and develop a full set of uncertainties and  
8 everything. That is too -- a little much to ask. But do  
9 you have a plan on how you are going to deal with  
10 uncertainties in this whole aspect?

11 MR. THADANI: I think that is the concept of -- in  
12 my mind at least, the concept of decision criteria. You  
13 have to, I think, in some cases you must address the whole  
14 issue of uncertainties before you make a decisions. And  
15 there may be areas where I think you can be quite confident  
16 that it is okay to go ahead. That you don't have to do  
17 massive analysis.

18 So, yes, Tom. That is an issue, but that's an  
19 issue that we will address as part of developing decision  
20 criteria. Yes, but you can't walk away; you must face it,  
21 but, again, I think it is how you are applying it; where you  
22 are applying it.

23 MR. LEWIS: You know, the point that Tom has  
24 raised I think of as the central overriding, overreaching  
25 issue in the use of PRA within the Agency, and that is that

1 it is a regulatory agency which has to make boundary  
2 decisions. You don't give somebody 73 percent of a license  
3 to operate or anything like that. It isn't done. You don't  
4 pay them 30 percent of his work.

5 MR. THADANI: We use to call them provisional  
6 licenses, if you remember.

7 MR. LEWIS: We don't do that kind of thing. And,  
8 therefore, the problem of translating information which  
9 necessarily contains uncertainty into decision which are  
10 certain -- you know, you will be fined if you go 56 miles  
11 per hours -- is a really fundamental, deep, statistical,  
12 philosophical, and practical question. It is not just a  
13 manual I alluded to reading books on statistical decision  
14 theory. If you read them, you will find out that they are  
15 very hard books to read. In fact -- it is central. I am  
16 just emphasizing.

17 MR. WILKINS: I think we are starting to enjoy  
18 ourselves.

19 [Laughter.]

20 MR. WILKINS: Don't think I didn't notice. We are  
21 not expected to write a letter or response as this time on  
22 this subject. I'd like to thank Ashok for his remarks,  
23 repeat our commendation on his promotion, and move on to the  
24 next agenda.

25 MR. CATTON: Will we see more or less of you?

1 MR. WILKINS: He can expect to hear from us again.  
2 What have we left out, Jay?

3 MR. CARROLL: In commending Ashok. I enjoyed your  
4 report on today's activities.

5 MR. THADANI: I thank you very much.

6 MR. WILKINS: It was very well done.

7 MR. THADANI: Thank you.

8 MR. WILKINS: And it said some things, unlike a  
9 lot of reports that I've read.

10 MR. THADANI: Yes, it did. Now Eric is going to  
11 have to deal with it somehow.

12 [Laughter.]

13 MR. WILKINS: But you will be at NRI.

14 MR. CATTON: And you get to watch.

15 MR. WILKINS: Okay. Thank you very much.

16 [Whereupon, at 5:21 p.m., the recorded portion of  
17 the ACRS was concluded.]

18

19

20

21

22

23

24

25

REPORTER'S CERTIFICATE

This is to certify that the attached proceedings  
before the United States Nuclear Regulatory  
Commission  
in the matter of:

NAME OF PROCEEDING: 406th ACRS Meeting

DOCKET NUMBER:

PLACE OF PROCEEDING: Bethesda, MD

were held as herein appears, and that this is the  
original transcript thereof for the file of the  
United States Nuclear Regulatory Commission taken  
by me and thereafter reduced to typewriting by me  
or under the direction of the court reporting  
company, and that the transcript is a true and  
accurate record of the foregoing proceedings.

*Ann Riley*  
\_\_\_\_\_  
Official Reporter  
Ann Riley & Associates, Ltd.

**ACRS Briefing on a Draft Commission Paper**

*New Accident Source Terms for Advanced Light Water Reactors*

**Part I: Overview of Commission Paper and General Approach**

---

**Dr. Frank J. Congel, Director, DRSS/NRR**

**and**

**Thomas H. Essig, Section Chief, PRPB/DRSS/NRR**

---

**February 10, 1994**



## ***SCOPE OF BRIEFING***

---

- **Part I (Today's briefing)**
  - ✓ **Overview of draft Commission paper (technical and policy issues)**
  - ✓ **General approach to application of source term parameters**
  
- **Part II (3/94 briefing)**
  - ✓ **Detailed technical discussion of key implementation issues**
  - ✓ **Responses to ACRS questions**

## SOURCE TERM DEVELOPMENT

- TID source term (ca. 1962)
  - ✓ Used with RGs 1.3 & 1.4 (ca. 1974)
  - ✓ Non-mechanistic
  - ✓ Intentionally conservative assumptions
  - ✓ Licensing basis for current operating plants
  
- NUREG-1465
  - ✓ Published as comment draft, 6/92
  - ✓ Final report to be published in 1994
  - ✓ Considers 30 years of research
  - ✓ Mechanistic, mean-value approach

## **SOURCE TERM DEVELOPMENT (con't)**

- **Draft Commission paper on source terms**
  - ✓ **To be issued for comment, 2/94**
  - ✓ **Defines general application of NUREG-1465 to ALWR design reviews**
  - ✓ **Guidelines for System 80 + , AP600, SBWR**
  - ✓ **Application to operating plants not yet determined**

## **ACCIDENT SOURCE TERM**

- Release of fission products into containment and potentially available for release to the environment
  
- General attributes
  - ✓ Timing & quantity
  - ✓ Chemical & physical form
  - ✓ Radionuclide composition
  
- Licensing uses
  - ✓ Part 100 siting evaluations
  - ✓ Defines environment for systems
  - ✓ Effectiveness of mitigation features

## OVERVIEW OF COMMISSION PAPER

- Design basis vs. severe accidents
  - ✓ NUREG-1465 encompasses entire spectrum of severe accidents
  - ✓ Commission paper truncates source term for DBAs
  
- Twelve source term implementation issues
  - ✓ Nine directly linked
  - ✓ Three (#4, #11, & #12) are related, ALWR contemporary issues

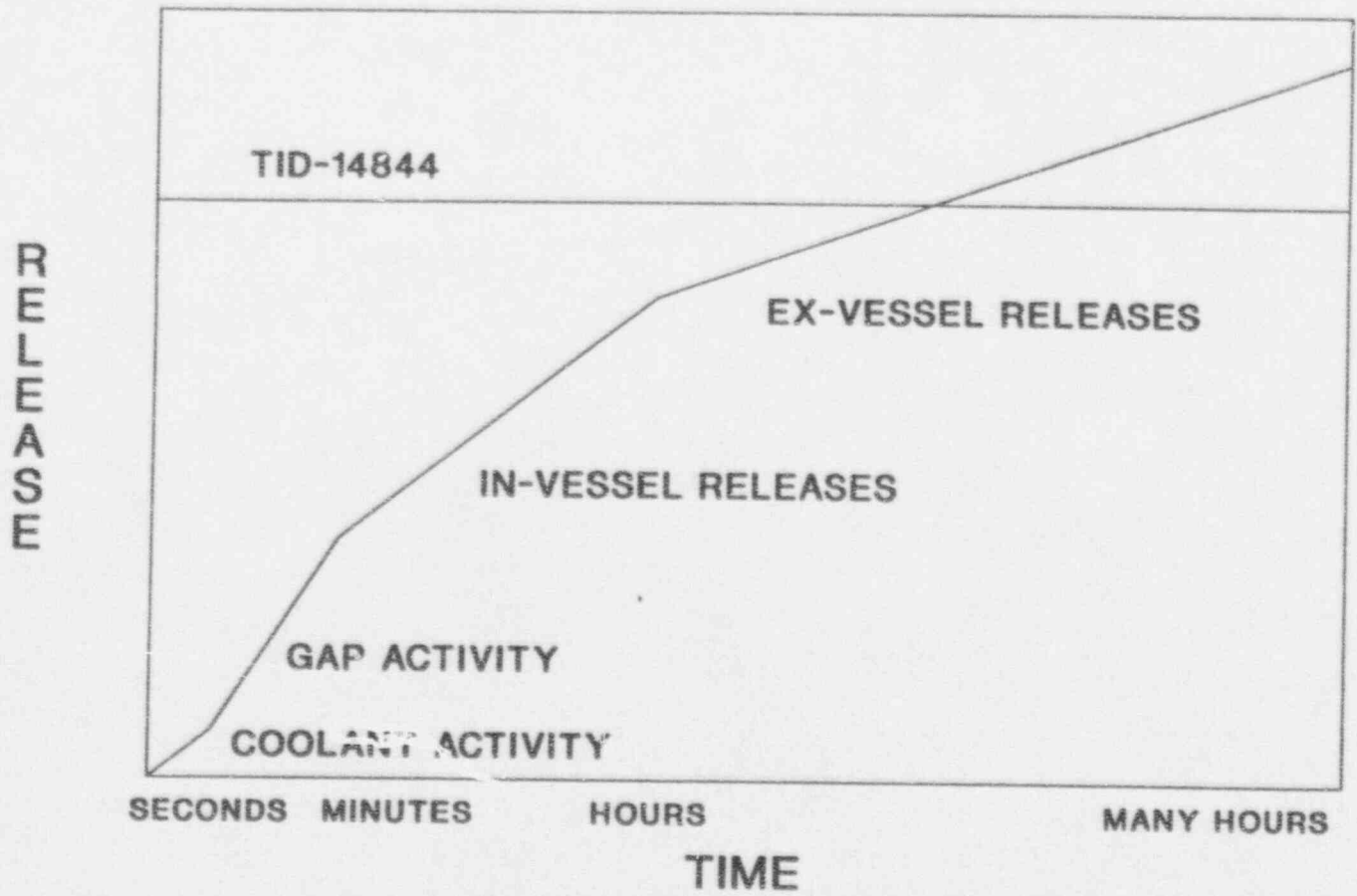
## ISSUE #1: SELECTIVE USE OF NUREG-1465

- Severe accident release phases
  - ✓ Coolant release
  - ✓ Gap release
  - ✓ Early in-vessel release
  - ✓ Ex-vessel release
  - ✓ Late in-vessel release
  
- Design basis accident analysis
  - ✓ Considers releases through early in-vessel phase
  
  - ✓ Intact pressure vessel and containment for DBA consistent with use of TID source term for licensing current operating plants

# CONCEPT OF REVISED SOURCE TERM

Design Basis Accidents —···>

Severe Accidents ———·>



## ISSUE #2: IODINE CHEMICAL FORM

- Release of iodine into containment as CsI
  - ✓ I<sub>2</sub> release inhibited if pH > 7
  - ✓ pH control in containment (e.g., sump) is essential
  - ✓ 95% of iodine will appear in containment atmosphere as particulates (CsI)
- Remaining iodine (5%) is elemental and organic
  - ✓ Staff concluded that not more than 5% of this 5% component would appear in containment as an organic form (e.g., CH<sub>3</sub>I)
  - ✓ Remaining 4.75% will appear in containment atmosphere as I<sub>2</sub>



### ISSUE #3: EQUIPMENT SURVIVABILITY

- Radiation environment based on severe accident releases (RPV failure and core-concrete interaction)
- Evaluation of survivability must also consider temperature, pressure, and humidity
- Acceptance based on reasonable level of confidence that equipment will survive and operate over required timespan

**ISSUE #4**  
**IODINE DEPOSITION ON BWR STEAMLINES**

- Issue based on GE request for removal of MSIV Leakage Control System
- Requires main steam piping and condenser to remain structurally intact after SSE to act only as holdup volume (7/21/93 SRM approved)
- Staff's model credits deposition of particulate and elemental iodine
- Applied to ABWR; SBWR to be reviewed

***ISSUE #5***  
***HOLDUP IN SECONDARY CONTAINMENT***

- Issue applies only to SBWR Safety Envelope
- Is concrete structure surrounding primary containment
- Design leak rate < 25 v/o per day; to be verified by COL holder's Technical Specifications
- Applicant (GE) is requesting credit for fission product holdup (for decay)

## ISSUE #6: FP RELEASE TIMING

- *TID source term assumed to appear instantaneously in containment*
- *NUREG-1465 provided basis for mechanistic time sequence to core melt*
- *For DBA assessments, PWR core melting would begin 30-40 minutes into the accident; BWR core melting would begin at about 60-70 minutes*
- *Staff to consider design-specific timing if sufficiently justified by applicant*
- *Impacts of release timing*
  - ✓ *DBA assessments*
  - ✓ *Control room habitability system operation*
  - ✓ *Operation of ESF filtration systems*
  - ✓ *Containment and MSIV closure*
  - ✓ *Containment purge isolation*
  - ✓ *Diesel generator start time*

**ISSUE #7**  
**AEROSOL DEPOSITION IN CONTAINMENT**

- TID source term provided for plateout of 50% of iodine released to containment
  
- Current staff position considers two natural processes for aerosol removal within containment:
  - ✓ Sedimentation (gravitational settling and agglomeration)
  
  - ✓ Diffusion mechanisms
    - Diffusiophoresis (condensing on heat sink)
  
    - Thermophoresis (deposition due to thermal gradients)
  
- Credit for deposition is essential when no spray system provided

**ISSUE #8**  
**AEROSOL REMOVAL BY BWR SUPPRESSION POOL**

- SRP 6.5.5 (ca. 1988) credits removal of particulate and elemental iodine by scrubbing in pool
- Issue not totally dependent on new source term
  - ✓ ABWR suppression pool credited (review based on TID source term)
  - ✓ SBWR suppression to be reviewed for credit (references new source term)

**ISSUE #9**  
**USE OF CONTAINMENT SPRAY SYSTEMS**

- Spray systems faced with a different spectrum of atmosphere contaminants (primarily particulates) relative to the TID source term
  
- Evolutionary designs (ABWR & System 80 + ) provide safety grade spray systems
  - ✓ ABWR designed to TID source term (no credit requested by GE)
  - ✓ System 80 + designed to new source term
  
- Passive designs have not provided safety grade spray systems
  - ✓ SBWR design provides non-safety spray
  - ✓ AP600 design provides no spray system

**ISSUE #10**  
**USE OF ESF ATMOSPHERE CLEANUP SYSTEMS**

- Engineered safety feature (ESF) atmosphere cleanup systems include:
  - ✓ High efficiency particulate air (HEPA) filters
  - ✓ Charcoal adsorbers
- Additional demands on HEPA filters
  - ✓ Iodines in particulate form (credit for DBAs and mitigation of severe accident consequences)
  - ✓ Large concentrations of non-radioactive aerosols from core-concrete reaction during severe accident sequences
- Staff may consider reducing pedigree of charcoal if not needed for DBA credit



**ISSUE #11**  
**ONSITE ATMOSPHERIC DIFFUSION MODEL**

- **New model not related to source term efforts**
- **Produces estimates of airborne activity at control room air intake which result from leakage from various in-plant sources**
- **New model is more realistic, can be used for operating plants and ALWR designs**

## **ISSUE #12: TUBE FAILURE IN SBWR PCCS**

- **SBWR passive containment cooling system (PCCS) removes decay heat from containment after a LOCA**
- **PCCS loops are an extension of containment and do not have isolation valves**
- **Staff considers their failure to be a new DBA, as it would result in containment bypass**

## SOURCE TERM APPLICATION TO ALWRs

- GE-ABWR (evolutionary design)
  - ✓ TID source term used by applicant & staff
  - ✓ Credit for deposition in steam lines
  - ✓ ACRS Subcommittee briefing on FSER Ch 15: December 1993
  
- ABB-CE System 80+ (evolutionary design)
  - ✓ Source term from NUREG-1465/Commission paper used by applicant and staff
  - ✓ ACRS Subcommittee briefing on FSER Ch 15: April 1994

## SOURCE TERM APPLICATION TO ALWRs (con't)

- Westinghouse AP600 (passive design)
  - ✓ Applicant based accident analyses on EPRI source term
  - ✓ Staff will base its accident analysis on final NUREG-1465 and Commission paper
  - ✓ ACRS briefing not yet scheduled
  
- GE Simplified BWR (passive design)
  - ✓ Applicant based accident analyses on EPRI source term
  - ✓ Staff will base its accident analysis on final NUREG-1465 and Commission paper
  - ✓ ACRS briefing not yet scheduled

**LAND VEHICLE INTRUSION AND  
DESIGN BASIS EXPLOSIVE**

---

**NRC's Proposed Rule**

**Robert N. Whitesel  
NUMARC  
February 10, 1994**

---

**NUMARC**

# INTRODUCTION

---

- Overview
- Timing
- Likelihood of radiological sabotage attempts
- Backfit rule considerations
- Design basis threat
- Industry perspective
- Principles
- Schedule
- Summary

## OVERVIEW

---

- NRC considering changes in pieces - integration is needed
- Proposed changes not supported by analyses
- No basis for linking TMI/WTC events
- Agree on keeping unauthorized vehicles outside protected area
- Issue is business prudence
- Approach:            realistic  
                             reasonable  
                             integrated

## TIMING

---

- Design Basis Threat Review in 2 phases
  - Phase 1 - LVI/DBX
  - Phase 2 - general reevaluation of DBT
- Integrate results of both phases before proposing rulemaking



# LIKELIHOOD OF RADIOLOGICAL SABOTAGE ATTEMPT

---

- History of events at nuclear power plants
- TMI Event - 2/7/93
- WTC Event - 2/26/93
- What's the connection?
- In 1991, NRC judged
  - likelihood extremely low
  - change in DBT unwarranted

## BACKFIT RULE CONSIDERATIONS

---

- Not a matter of adequate protection
- There must be
  - Substantial increase in overall public protection
  - Favorable cost-benefit balance
- Statements about public protection and cost-benefit are only assertions

# DESIGN BASIS THREAT

---

- Current external threat is paramilitary
- NRC's proposed change is very conservative
  - Moving truck → rare instance bomb
  - Proposed size → unnecessary conservatism
  - Proposed bomb and vehicle ↔ suicide mission
- No recognition of defense-in-depth philosophy

## INDUSTRY PERSPECTIVE

---

- Industry agrees
  - No unauthorized vehicles inside protected area
  - If bomb is set off, should be able to shutdown safely
- Employee safety, protection of investment and public confidence
- Barrier system should be industrial grade
- Requirements must not allow regulation by inspection

# PRINCIPLES

---

- **DBV**
  - mass of 4W Drive vehicle
  - limited speeds of approach
  - carries personnel/equipment only
  - total mass and max impact speed limited
  
- **Objective of Barrier System**
  - stop forward motion in vicinity of PA fence

## PRINCIPLES (continued)

---

- DBX
  - will be stationary outside PA
  - limited size
- Safe shutdown following detonation of DBX
- Commercial grade design, procurement and installation is appropriate; “nuclear grade” review and inspection not necessary

## SCHEDULE

---

- 6 months after issuance of final rule and guidance to submit plans
- 18 months to install
- Factors:
  - site configuration
  - outages
  - material
  - weather

## SUMMARY

---

- Agree on keeping unauthorized vehicles outside protected area
- Reason is business prudence
- Approach: realistic  
reasonable  
integrated with other  
changes



**NRR STAFF PRESENTATION TO THE  
FULL COMMITTEE  
ACRS**

**SUBJECT: RULEMAKING ON MALEVOLENT  
USE OF VEHICLES AT  
NUCLEAR POWER PLANTS**

**DATE: FEBRUARY 10, 1994**

**PRESENTER: PHILLIP F. MCKEE, CHIEF  
SAFEGUARDS BRANCH, DRSS**

**PRESENTER'S  
PHONE NUMBER: 504-2933**

<b>NUMBER OF PUBLIC COMMENTERS:</b>	<b><u>32</u></b>
<b>LICENSEES RESPONDING:</b>	<b><u>24</u></b>
<b>PRIVATE INDIVIDUALS:</b>	<b><u>2</u></b>
<b>PUBLIC INTEREST GROUPS</b>	<b><u>3</u></b>
<b>INDUSTRY GROUPS</b>	<b><u>3</u></b>
<b>TOTAL NUMBER OF COMMENTS:</b>	<b><u>164</u></b>

# TOPICAL AREAS OF COMMENTS

## THREAT CONSIDERATIONS

- **VALIDITY OF VEHICLE INTRUSION AND VEHICLE BOMB THREAT**
- **COUPLING VEHICLE INTRUSION AND VEHICLE BOMB THREAT**
- **CHARACTERISTICS OF DESIGN BASIS VEHICLE/EXPLOSIVE**
- **INTEGRATION WITH DESIGN BASIS THREAT REEVALUATION**
- **CONFLICT OF PROPOSED THREAT AND 10 CFR PART 50.13**

## **TOPICAL AREAS OF COMMENTS, cont'd.**

### **REGULATORY AND BACKFIT ANALYSIS**

- **LACK OF QUANTITATIVE BASIS**
- **CONSIDERATION OF REDUNDANT SAFEGUARDS SYSTEMS**

## **TOPICAL AREAS OF COMMENTS, cont'd.**

### **RULE IMPLEMENTATION**

- **SCHEDULE**
- **NRC REVIEW AND APPROVAL OF LICENSEE SUBMITTAL**
- **QUALIFICATION OF VEHICLE BARRIERS**
- **JUSTIFICATION AND DOCUMENTATION FOR LICENSEES TO PROPOSE USE OF ALTERNATIVE MEASURES TO PROTECT AGAINST A VEHICLE BOMB**

**STATUS OF PRA PLAN IMPLEMENTATION  
PLAN DEVELOPMENT**

**PRESENTATION TO THE ACRS  
ASHOK THADANI, DIRECTOR  
DIVISION OF SYSTEMS SAFETY AND ANALYSIS  
FEBRUARY 10, 1994**

## SUMMARY OF ACTIVITIES SINCE LAST ACRS MEETING

- BRIEFINGS ON KEY ELEMENTS OF PROPOSED PLAN
- COORDINATION MEETINGS WITH NUMARC
- IDENTIFIED CATEGORIES OF AGENCY PRA USE
- IDENTIFIED FEATURES OF PLAN FOR EACH REGULATORY CATEGORY
- BEGAN DEVELOPING DRAFT POLICY STATEMENT

## COORDINATION MEETINGS WITH NUMARC

### REGULATORY THRESHOLD WORKING GROUP

- o ISSUES
- o PSA APPLICATION GUIDE
- o PRIORITIES
- o SCHEDULES

### APPENDIX B WORKING GROUP

- o DISCUSSION
- o ROLE OF MAINTENANCE RULE
- o PILOT PLANT CANDIDATES
- o SCHEDULES



# **CATEGORIES OF AGENCY PRA USE**

## **I. Regulatory Requirements**

**Advanced Reactor Reviews**

**Generic Issues**

**Regulatory Effectiveness Evaluation**

**Changes to Regulations, Requirements,  
and Guidance**

**Low- and High-Level Waste Facilities**

## **II. Event Assessment**

**Event Investigation**

**Event Study and Follow-up**

# **CATEGORIES OF AGENCY PRA USE (Continued)**

## **III. Enhancement of Existing Programs**

**Inspection**

**Operator Licensing**

**Senior Management Meetings**

**Plant-specific Licensing Actions**

**Nuclear Materials Licensee Reviews**

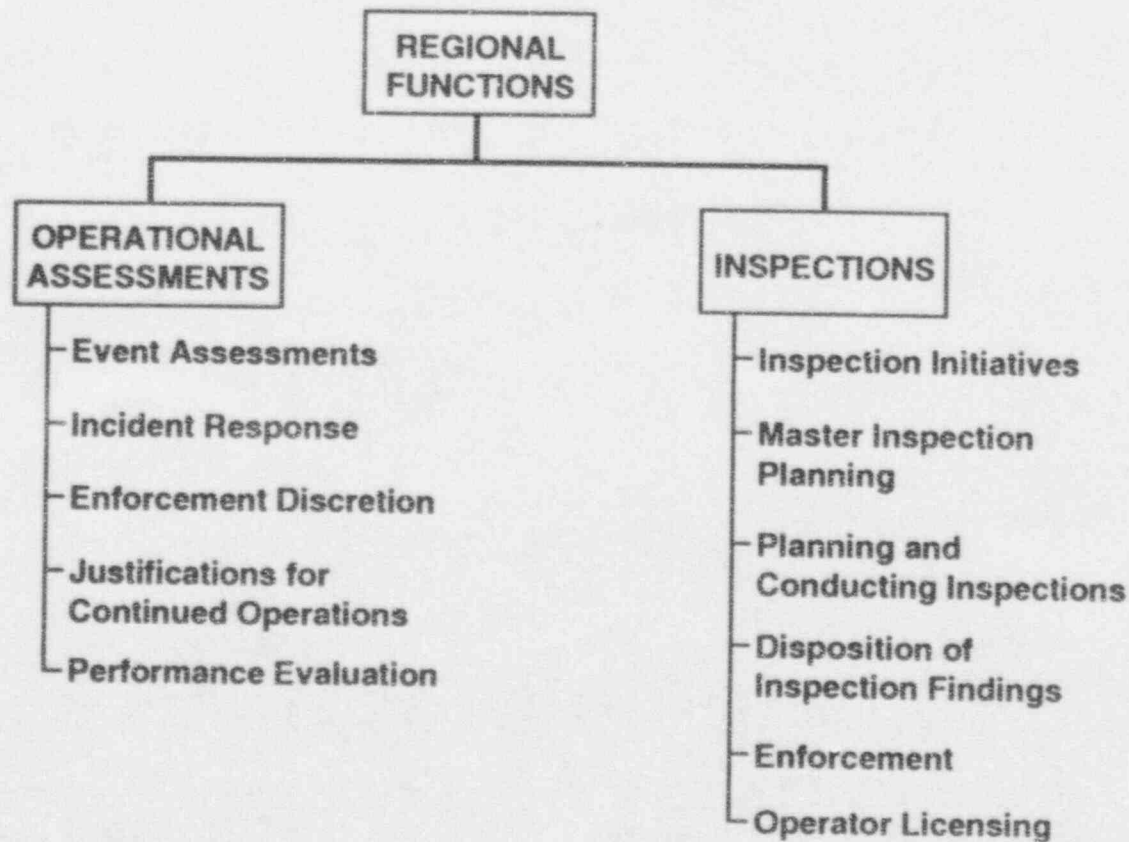
## **IV. Severe Accident Closure**

**Individual Plant Examinations**

**Containment Performance Improvement**

**Accident Management**

# REGIONAL APPLICATIONS OF RISK INSIGHTS



# **FEATURES OF A PLAN FOR PRA USE WITHIN EACH REGULATORY ACTIVITY**

- Objectives
- Methods
- Guidance Development
- Training
- Regulatory Changes
- Needed PRA Tools and Data
- Organizational Responsibility
- Resource Requirements

# **PROCESS FOR PLANNING FUTURE PRA IMPLEMENTATION IN THE NRC**

- **Identify regulatory activities in which use of PRA methods and insights should continue or be expanded;**
- **Interface with the ACRS and interested parties on the planned PRA activities;**
- **Develop an integrated approach for accomplishing goals and objectives for PRA use in each regulatory activity identified;**

# **PROCESS FOR PLANNING FUTURE PRA IMPLEMENTATION IN THE NRC (Continued)**

- **Prioritize regulatory activities requiring inter-Office coordination;**
- **Integrated plan:**
  - **Identify categories, schedules and resources, April 1994**
  - **Develop Office-level operating plans, June 1994**
- **Modify the NRC Five-Year Plan as needed.**

# **POLICY STATEMENT ON THE NRC'S USE OF PRA**

- **Declare the Agency's commitment to increased use of PRA methods and insights in its regulatory activities, recognizing strengths and limitations of PRA use.**
- **Provide an opportunity for public comment on the Agency's increased use of PRA.**

## **Milestones:**

- **Discuss draft policy statement with ACRS in February 1994.**
- **Issue draft for public comment in April 1994.**
- **Discuss final policy statement with ACRS in August 1994.**
- **Complete the final policy statement by October 1994.**

## **During PRA plan development, continue on-going activities:**

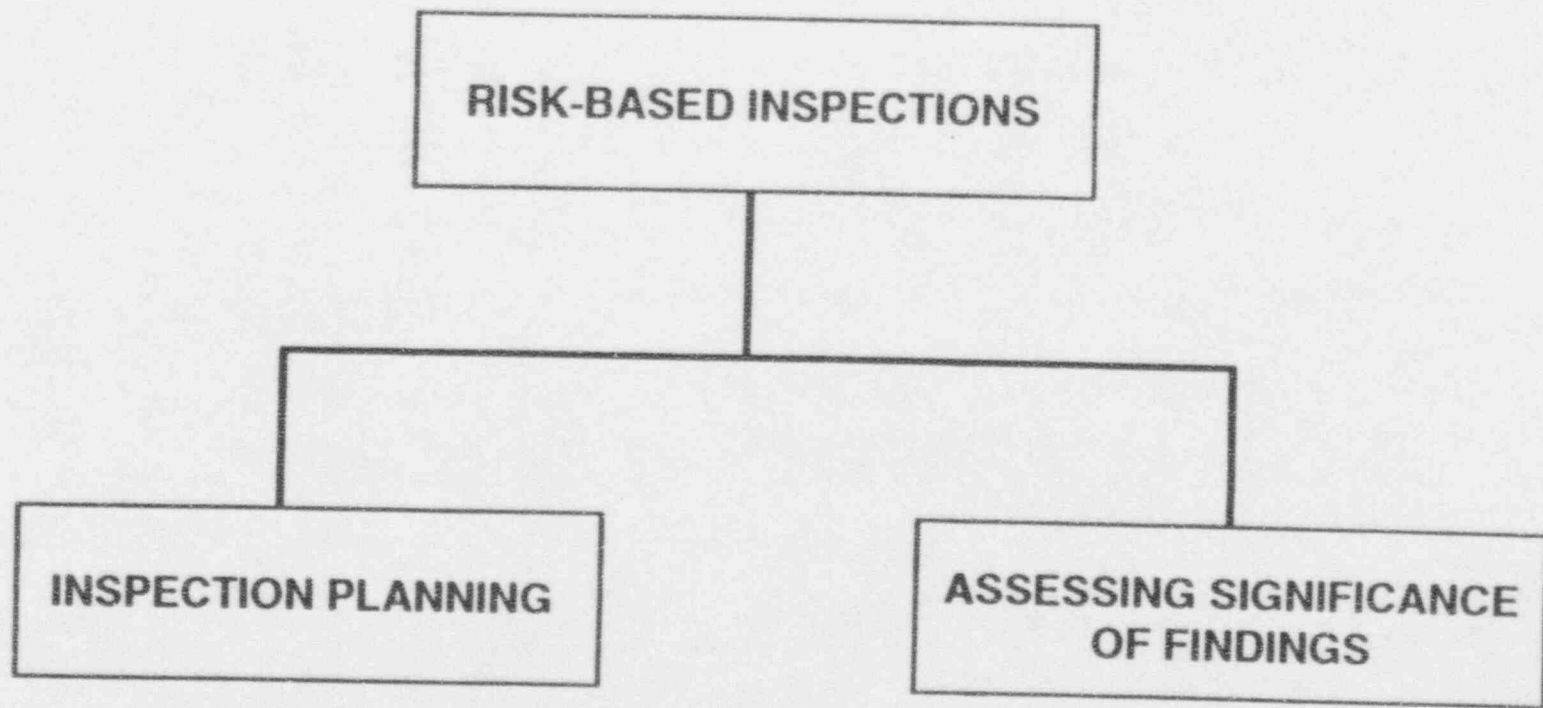
- **Appendix B, Quality Assurance - Initiate pilot graded QA program in September 1994**
- **Appendix J, Containment Leakage - Proposed rule, late Spring 1994**
- **GL 89-10, Motor Operated Valves**
- **South Texas Project Technical Specifications**
- **Meeting in February 1994 with NUMARC to discuss priorities**



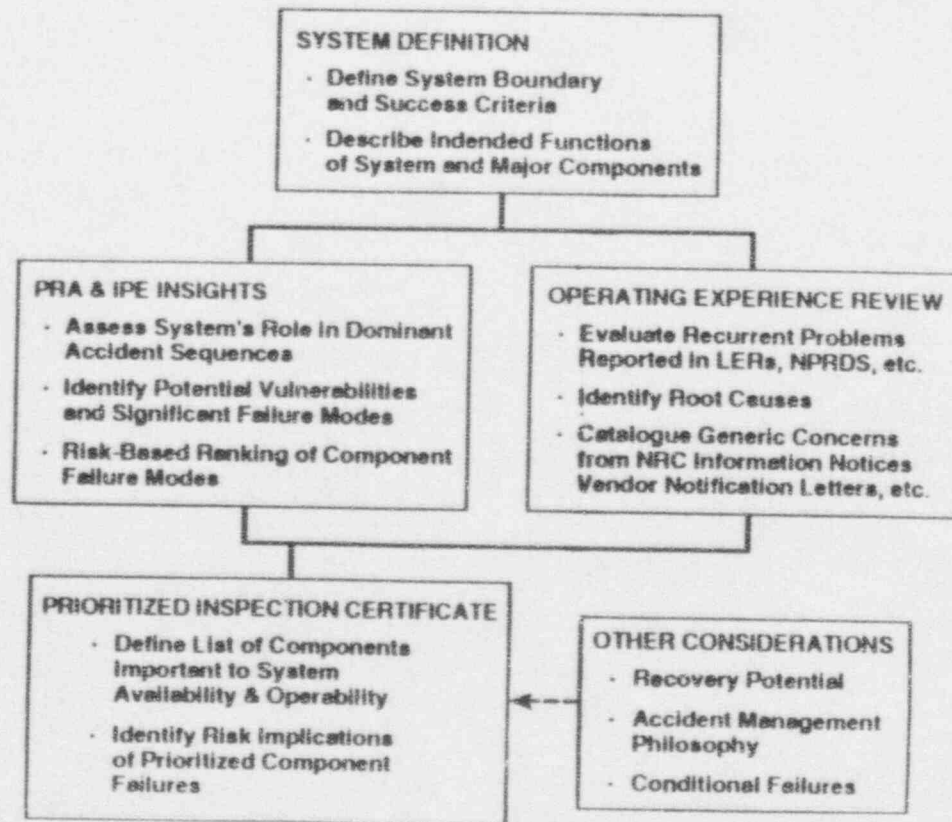
# **CURRENT NRC PRA ACTIVITIES**

- LICENSING ACTIONS
- INSPECTIONS
- EVENT ASSESSMENTS
- SEVERE ACCIDENTS
- DATA BASE
- GENERIC ISSUES
- ADVANCED REACTORS
- SENIOR MANAGEMENT MEETINGS
- ACCIDENT SEQUENCE PRECURSORS
- REGULATORY CHANGES

17



# RISK-BASED APPROACH TO INSPECTION PLANNING



# RISK-BASED APPROACH FOR ASSESSING THE SIGNIFICANCE OF INSPECTION FINDINGS

19

