UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

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4 BRIEFING ON FINAL REPORT ON BWR MARK I

5 CONTAINMENT ISSUES

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7 PUBLIC MEETING

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9 Nuclear Regulatory Commission

10 One White Flint North

11 Rockville, Maryland

12

13 Monday, February 27, 1989

14

15 The Commission met in open session, pursuant to

16 notice, at 2:00 p.m., the Honorable LANDO W. ZECH, JR.,

17 Chairman of the Commission, presiding.

18

19 COMMISSIONERS PRESENT:

20 LANDO W. ZECH, JR., Chairman of the Commission

21 THOMAS M. ROBERTS, Member of the Commission

22 KENNETH M. CARR, Member of the Commission

23 KENNETH C. ROGERS, Member of the Commission

24 JAMES R. CURTISS, Member of the Commission

25

1 STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

2 SAMUEL J. CHILK, Secretary

3 WILLIAM C. PARLER, General Counsel

4 DR. FOREST REMICK, Chairman, ACRS

5 DAVE WARD, ACRS, Chairman, Containment Requirements

6 Subcommittee

7 DR. BILL KERR, ACRS, Chairman, Severe Accidents

8 Subcommittee

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

2 (2:03 p.m.)

3 CHAIRMAN ZECH: Good afternoon, ladies and
4 gentlemen.

5 Today's meeting is with the Advisory Committee
6 on Reactor Safeguards, the representative group of the
7 Advisory Committee.

8 In a recent staff letter, SECY 89-17, and in a
9 public meeting held on January 26th, 1989, the NRC staff
10 recommended that orders for plant-specific backfit of
11 boiling water reactors using Mark I containments be issued
12 to require certain safety improvements that the staff
13 deemed to be both cost-effective and a substantial
14 enhancement to the safety of these plants.

15 In this meeting the staff referred to the ACRS
16 letter of January 19th, 1989, on this subject, in which
17 the Advisory Committee on Reactor Safeguards recommended
18 that the staff's proposed improvement plan be dropped, so
19 that licensee and NRC resources could concentrate on the
20 more effective individual plant examination approach.

21 The Commission has been told by the NRC staff,
22 essentially, that boiling water reactors using Mark I
23 containments did not pose an undue risk to public health
24 and safety, that the overall risk to the public from these
25 plants is comparable to that posed by other plant types,

1 and that these plants could continue to operate safely.

2 I understand that ACRS is in agreement with this

3 staff's overall conclusion. However, the staff also told

4 us that in the highly unlikely event of a severe core

5 damage accident for a boiling water reactor, the Mark I

6 containment has a higher likelihood of containment

7 failure.

8 Thus, the focus of the staff's effort in its

9 review of Mark I containment performance was to provide a

10 balance between prevention and mitigation of severe

11 accidents for Mark I plants, by reducing the likelihood of

12 containment failure, thereby improving accident

13 mitigation.

14 In carrying out the Commission responsibility

15 for public health and safety, the Commission, as you know,

16 relies on the advice of the Advisory Committee on Reactor

17 Safeguards to provide an independent technical assessment

18 of matters related to nuclear safety.

19 Accordingly, the Commission requested this

20 meeting with the Advisory Committee on Reactor Safeguards

21 in order to assure that we have complete understanding of

22 the ACRS views on the NRC's staff's recommended Mark 1

23 containment improvements, before coming to a decision on

24 this matter.

25 There is no vote scheduled for the meeting this

1 afternoon. The Commission will vote on this matter at a
2 later date.
3 Do any of my fellow Commissioners have any
4 opening comments, before we begin?
5 (No response)
6 CHAIRMAN ZECH: First of all, Dr. Remick, before
7 you proceed, I would like to congratulate you on your
8 recent appointment as the Chairman of the ACRS, and I
9 welcome you and your colleagues to this meeting today.
10 You may proceed, Dr. Remick.
11 DR. REMICK: Thank you, Chairman Zech,
12 Commissioners, it is a pleasure for us to be here, and
13 discuss our January 19th letter.
14 Perhaps I first should explain why there are
15 only three of us here. When we got word of your request,
16 we tried to arrange a time when the full committee could
17 meet with you, and found that in the February-March time
18 frame, we couldn't come to a mutually agreeable time. So,
19 we went back and said, well, who are the essential
20 attendees, and it turned out that three of us are the ones
21 -- and I will explain in a minute why.
22 We did invite other members to attend, if they
23 could, but they were not able to join us today. So that's
24 why there are only three of us here.
25 CHAIRMAN ZECH: Well, we appreciate very much

1 your being with us today, all of you.

2 DR. REMICK: Good.

3 And the three, Dave Ward is the Chairman of our
4 Containment Systems Subcommittee, and Bill Kerr is
5 Chairman of our Severe Accident Subcommittee. So, that's
6 why it was essential that Bill and Dave be here, and I am
7 to keep them separated, I believe.

8 (Laughter)

9 DR. REMICK: Before we get into a discussion of
10 the letter, I thought it might be helpful to put that
11 letter of January 19th in the context of some things that
12 the ACRS has been saying recently on related matters. And
13 I would like to specifically refer to three letters that
14 we have written in the last year.

15 The first one, March 15th, which was entitled
16 ACRS Comments on the Need for Greater Coherence Among New
17 Regulatory Policies. And I would like to just abstract a
18 few sentences from that letter, where we said that "The
19 problem we see is an increasing lack of coherence and
20 integration among several separate areas of policymaking
21 within the NRC".

22 We go on to say later, "The severe accident
23 policy is only one of a number of new Commission policies
24 and programs concerning nuclear power plants that have
25 been advanced over the past two or three years. Others

1 relate to the safety goal, standardized plant designs,
2 ISAP and advanced reactors. In addition, the resolution
3 of USIs and GIs has led, or might lead to important new
4 requirements and guidance for licensees in several areas.
5 "Although the NRC staff, the ACRS and the
6 Commission have provided some overall guidance toward
7 integration of these policies and new requirements, we
8 believe this has been insufficient. As a result,
9 licensees can be confused, or burdened with contradictory
10 new requirements from different parts of the NRC staff."
11 Then on May 10th, in a letter which was entitled
12 Proposed Generic Letter on Individual Plant Examinations
13 and the Proposed Integrated Safety Assessment Program, we
14 said that "These two programs, developed by different NRC
15 staff groups, have not been integrated, even though they
16 deal with many of the same issues.
17 "We believe that the IPE program should be
18 expanded to incorporate all outstanding safety issues, not
19 just those under the severe accident rubric. The generic
20 letter should be revised accordingly."
21 And further in the letter we said, "In our
22 report of March 15th, we expressed our concern that there
23 was a lack of coherence among the several principal
24 regulatory programs of the Commission. We believe the IPE
25 program offers an opportunity for providing improved

1 coherence. In its present form the generic letter will
2 instead continue the current compartmentalization".
3 "Further", we said, "we propose a program
4 characterized as follows:
5 "The purpose of the IPEs would be acknowledged
6 as broader than the original intent of searching for
7 outliers. Instead, it would call for a general risk
8 reassessment of each plant, using the body of information
9 available from the TMI 2 accident experience, development
10 of PRA, existing severe accident research and the general
11 experience of about 1100 reactor years. All outstanding
12 safety issues, USIs, GIs, et cetera, would be subsumed by
13 the program. It would be made clear that the intent of
14 the program would be for this to be the end of the
15 requirements for licensees. This would be changed only by
16 the advent of important new information, or experience.
17 "We note that the IPE program proposed by the
18 NRC staff already has been expanded well beyond the search
19 for outliers concept. In subsuming USI-845, shutdown
20 decay heat removal requirements into the IPE, for example,
21 the staff has taken a major step in the direction we are
22 suggesting. Our proposal extends this to a more logical
23 conclusion."
24 And then, finally, in our July 20th letter of
25 1988, and that was on the Report on the Integration Plan

1 for Closure of Severe Accident Issues, we said, "We
2 commend the NRC staff for its efforts to develop an
3 integrated approach for dealing with the various severe
4 accident issues, and to centralize responsibility for
5 resolving them. SECY 88-147 describes the first step
6 towards developing such a plan, namely, identifying the
7 relevant issues; however, it gives little information on
8 how the various issues are to be integrated. Rather, it
9 discusses the severe accident-related issues and programs
10 that should be integrated, but does not describe the
11 process to be used."
12 And in closing, in that letter, we said,
13 "Finally, we encourage the staff to continue its efforts
14 toward integration of the various programs being developed
15 for resolution of the severe accident issues. We believe
16 that the most recent draft generic letter describing the
17 IPE program represents a move in the direction we have
18 recommended in our letter to you of May 10th, 1988. We
19 are convinced that further integration can serve resources
20 of both the staff and the licensees, and can contribute to
21 a more effective process for risk reduction in operating
22 plants".
23 So, it is that background that I think our
24 letter of January 19th should be read. In other words, it
25 is a -- we have been emphasizing a need for coherence, a

1 need for integration, and a need for regulatory stability.
2 At that point I would like to turn over to Dave
3 Ward, to address the letter itself.
4 MR. WARD: Thank you, Forest.
5 I am prepared to summarize the letter, just take
6 five minutes, or so to do that, but if you are familiar
7 with it, have just read it, we could just go ahead and--
8 I would like to hear what questions you have, and it might
9 just --
10 CHAIRMAN ZECH: Well, we would appreciate -- we
11 will have some questions for you, I'm sure, but I think a
12 five-minute summary would be helpful to us.
13 MR. WARD: Okay. Fine.
14 CHAIRMAN ZECH: Thank you very much.
15 MR. WARD: This is the letter of January 19th,
16 of this year. And we pointed out that the Mark I plants
17 have been singled out for special attention because of
18 indications that there could be a high probability of
19 containment failure in certain severe accidents, but
20 despite this, these plants seem not to present a
21 particularly high risk to the public because their core
22 melt probability -- estimates of core melt probability of
23 this class of plants seem to be quite low, and because
24 they tend to have -- these BWR plants tend to have highly
25 versatile and capable emergency core cooling systems.

1 There are a lot of ways to get the vault water into the
2 core, and this shows up in any sort of a risk analysis.
3 So, if the risks from these plants isn't too
4 high, what is the problem? For example, do they meet the
5 safety goal?
6 Well, from our perspective, the answer to the
7 question do they meet the safety goal is, yes and no. If
8 we accept the ACRS proposal for fleshing out the safety
9 goal -- and as you know, we've had a series of
10 interchanges with your staff on the development of
11 fleshing out the safety goal.
12 If we accept that approach to the safety goal,
13 then it would seem that the Mark I's as a class, seem to
14 meet the risk part, the public health risk part of the
15 safety goal. They seem to meet the core melt quantitative
16 goal, but they do not seem to meet what we are going to
17 call "the balance goal", and that is they don't meet the
18 goal for minimum containment performance.
19 Now, the ACRS has suggested that there be a goal
20 for minimum containment performance as part of the overall
21 safety goal, to provide a balance between prevention and
22 mitigation. And we see this as an important part of
23 providing defense in-depth for the reactor systems.
24 Well, given that, then our disagreement with the
25 staff proposal for the Mark I improvements is that it

1 prescribes things that appear to be effective in making
2 the core melt probability lower -- that is, reducing still
3 further core melt probability that is already within--
4 conforms with the goal, the safety goal, but these things
5 do not seem to make much of an improvement in containment
6 performance.
7 So, they don't seem to improve the area of
8 weaknesses that has been of concern with the Mark I's.
9 Well, it hasn't been easy to identify a
10 straightforward way to fix the containment, to give them a
11 higher predicted performance in these very severe
12 accidents, and neither the staff nor the ACRS nor, for
13 that matter, I think the industry, have been able to
14 pinpoint specific solutions to some of the problems.
15 And for one thing, there are indications that
16 such fixes to vulnerabilities in containment -- Mark I
17 containments seem to be very plant-specific, both the
18 vulnerabilities, the particular detailed vulnerabilities,
19 and the optimum ways to fix those, to address, them seem
20 to be plant-specific.
21 So for this reason we, the ACRS, propose that
22 the -- what I might call the kind of semi-generic fixes
23 that have been proposed by the staff for Mark I
24 containments be dropped and, instead, the individual plant
25 examination, the IPE process, be used to identify

1 containment improvements that might be warranted at
2 specific plants.
3 Now, along the way, in our letter, we also
4 express some disagreement with the cost-benefit approach
5 which is being proposed by the staff for use in arguing
6 the necessity and the justification for the Mark I
7 improvements. And our disagreement is namely that it is
8 an attempt to apply a generic analysis of cost and
9 benefits to situations where both the benefits and the
10 costs seem to be very highly plant-specific, but this
11 question, this disagreement over the cost-benefit analysis
12 really becomes moot if our recommendation is adopted.
13 I think the work that the staff has done has
14 been of considerable benefit in focusing on the key issues
15 and vulnerabilities, and I think it should be of
16 considerable use to licensees when they conduct their IPE
17 programs and, particularly, indicating the need for
18 emphasis on the containment evaluation part of the IPE
19 programs for these Mark I plants. The staff analysis has
20 brought together -- brought to light some very important
21 issues in this particular area.
22 That's what we said in the letter, and I think
23 the most efficient thing now would be to ask for
24 questions, comments from you, Mr. Chairman, or the other
25 Commissioners.

1 CHAIRMAN ZECH: All right. Fine.

2 Mr. Kerr, do you want to hold up on your

3 presentation? Dr. Kerr.

4 DR. KERR: I don't have a presentation.

5 CHAIRMAN ZECH: Okay, fine.

6 All right, Commissioner Roberts?

7 COMMISSIONER ROBERTS: I have no questions, just

8 an observation. In my time here, it would appear to me

9 the members of the ACRS are quite outspoken individuals,

10 and are never hesitant to make their individual views

11 known which is, I think, admirable. And I note there are

12 no additional comments by any member, and I think that is

13 significant.

14 I don't have any questions.

15 CHAIRMAN ZECH: Commissioner Carr?

16 COMMISSIONER CARR: Well, it sounds like you

17 think there is nothing you can do to fix the containments,

18 and all the fixes are so the containment doesn't get

19 tested, is that reasonably stated?

20 MR. WARD: No. I think that's the conclusion

21 you might draw from the set of proposals the staff has

22 developed. I don't think we agree with that.

23 COMMISSIONER CARR: Well, what do you think--

24 you are only discussing what the staff has said they would

25 do, and you note that that would fix only -- that would

1 only reduce the probability of melt, rather than fix the
2 containments.
3 What kind of fixes do you recommend we do to the
4 containments?
5 MR. WARD: Well, that's the good question. And
6 the indications we have from the staff, is that the -- and
7 from other analyses we have seen, is that the Mark I
8 vulnerabilities and the fixes for them are very plant-
9 specific. And I think that is the heart of this whole
10 problem, is that we see a problem -- you know, everyone
11 perceives there is some sort of a problem with the
12 containments. We haven't figured out what to do about
13 this, so we are going to work on another problem instead.
14 COMMISSIONER CARR: Well, it seems logical that
15 if you expect the containment to be weak, it only makes
16 sense to vent it before it catastrophically ruptures, so
17 that you at least have a controlled vent, is that --
18 MR. WARD: That is certainly one possibility.
19 Bill wants to say something.
20 DR. KERR: We did not, as Dave says, attempt to
21 develop alternative recommendations. We didn't discuss
22 that in any detail, so I will speak only for myself. I
23 would think that probably, whether it is done in an IPE,
24 or as part of this proposed program, that Mark I's would
25 conclude that the installation of a hardened vent is a

1 good idea. And, indeed, from my point of view, this was
2 the only part of the staff's proposal that one might
3 identify as increasing the capability of the containment.
4 And I think what we felt was that almost
5 everything else had to do with decreasing core melt, and
6 that, indeed, this would be what one would be looking for
7 in the IPE. And it, therefore, made more sense to
8 integrate this with other things that might be used to
9 prevent core melt, or possibly to conclude that the core
10 melt probability was sufficiently low.
11 So my view, from what I have seen in the staff's
12 analysis, would be that the vent hardening is probably
13 worthwhile.
14 Now, this is not based on any significant
15 analysis that we have done independently. And, indeed, we
16 did not see numbers indicating that the staff had done a
17 careful analysis to show what improvement in containment
18 performance this would produce. I don't think one has
19 been made.
20 There is a consensus that it will increase the
21 capability, but how much is, I think, still an open
22 question.
23 COMMISSIONER CARR: Well, it doesn't seem like
24 it would increase the performance at all. It seems like
25 it would enable you to not --

1 DR. KERR: By performance, I mean the capability
2 of the containment to withstand a very severe accident.
3 And if, for example, one uses this before core damage has
4 begun, then you don't really need containment at that
5 point. You then have a containment with integrity when
6 core damage does occur, if a particular sequence was one
7 that involved those kinds of events.
8 It was in that sense that I was using the term
9 "performance".
10 COMMISSIONER CARR: I understand.
11 DR. REMICK: If I could answer that. I don't
12 believe that we have concluded that the Mark I
13 containments are deficient. Our view is that that's part
14 of the IPE process, that you will look at them, and
15 perhaps you will find some deficiencies there.
16 Now, I agree with Bill, that the venting is
17 certainly one step in being able to keep over-
18 pressurization of the suppression pool, and so forth, that
19 that is certainly one step that might improve containment,
20 but the staff has indicated that these represent no undue
21 risk, and that the modifications are not required for
22 adequate protection.
23 So, our question is why forge ahead when you've
24 just put out a letter on IPE, asking people to go through
25 this process, to come along then immediately after and

1 say, "But, oh, yes, but you need to do these right away".

2 And there are, I think, implications on that

3 because sometimes we overlook -- if you make those

4 modifications, you have to revise procedures and you have

5 to train people. And that takes time. And then if you

6 come along, after the IPE process, and say, well, maybe

7 shouldn't have done that, and make revisions, you are

8 adding a lot of confusion to the operating people, let

9 alone consuming their time and their resources.

10 So that's one reason we feel why rush ahead?

11 Why not provide some coherence to the program, provide

12 them this information -- as Dave points out, there is very

13 valuable information that has been generated -- make it

14 available to licensees for incorporation into the IPE

15 process.

16 CHAIRMAN ZECH: Commissioner Rogers?

17 COMMISSIONER ROGERS: Well, I think it is very

18 important for us to understand exactly what the meaning of

19 your letter of January 19th really is because it seems to

20 me there's a couple of different interpretations of it,

21 and maybe some of those might not be your intended

22 interpretation.

23 The last paragraph says, "We recommend the

24 proposed improvement plan for Mark I containments be

25 dropped, so that licensee and NRC resources can

1 concentrate on the more effective IPE approach".

2 One might read into that that the elements of

3 that plan, the five specific improvements for Mark I

4 containment plan that were in the staff plan, were

5 objectionable to you in some way. And if that is not the

6 case, I think we should be very clear on that you are not

7 objecting to those specific elements, as such, but that

8 you want to see that done in the context of an IPE rather

9 than as an add-on, but I think if you have any

10 reservations whatsoever about any of those five elements,

11 then we would like to know -- I certainly would like to

12 know what they are -- because one of them is new hardware,

13 -- that's the vent capability -- but some just represent

14 procedures and training, and staff actions.

15 Four and five of the five elements were--

16 number four was extended emergency procedures and

17 training. And number five was accelerated staff actions,

18 to implement the station blackout rule.

19 And I think it was made very clear, someplace, I

20 know, in something I read, that that acceleration was of

21 staff actions, not licensee actions necessarily.

22 And so I would like to be clear on whether you

23 had any objection to those elements themselves, one by

24 one, because some of them I don't see any particular

25 reason why they necessarily relate to an IPE. Four and

1 five, I don't see do -- maybe four might, perhaps, but
2 five, the accelerated staff actions to implement the
3 station blackout rule, I don't see what that's got to do
4 with an IPE.
5 So, in other words, I would like to be very
6 clear on what it was you really meant when you said that
7 the plan be dropped, whether that means that the elements
8 of the plan are unacceptable and should be dropped, or
9 whether some of them could be -- you know, the totality of
10 the plan, whether the plan could be implemented in part,
11 even if the part is only the accelerated staff actions to
12 implement the station blackout rule, or some other parts
13 -- you know, just what you really mean there.
14 I think that would be very helpful to us, to
15 have you make that clear.
16 MR. WARD: Okay. I think you have made a good
17 distinction, and we need to make -- our objection to the
18 plan is to generically apply this group of elements to all
19 plants. Some of those individual elements will probably
20 apply to specific plants, but we would like to see the IPE
21 process be used, and let those elements fall where they
22 will in that IPE process. If they are indicated to be
23 necessary, or worthwhile in the IPE process, then they
24 should be adopted for that particular plant.
25 And this is the sort of thing I meant, that the

1 material that the staff has developed will be useful to
2 the licensees, and to the staff, in going ahead with the
3 IPE process, but the blanket imposition of that group of
4 things on all Mark I's does not seem to us to be
5 warranted.
6 COMMISSIONER ROGERS: What is your feeling on
7 this?
8 DR. KERR: It is my own feeling that many of
9 these things are worthwhile, but I would like to see them
10 weighed against other things that one would do in the
11 course of the IPE. One is not going to necessarily do
12 everything, obviously. So one has to balance those things
13 that are most cost-effective, or most likely to eliminate
14 risk.
15 And you mentioned the station blackout, I agree
16 that's an extremely important issue, but it could depend
17 very markedly on what one does about decay heat removal.
18 That is one of the reasons the ability to work a station
19 blackout is extremely important.
20 So, even on that issue, I think if one does it
21 at the same time that one is looking at the total system,
22 to try to make the risk appropriate, it is likely to be
23 more effective and more efficient.
24 COMMISSIONER ROGERS: Except on that one, there
25 is a rule now that is to be implemented on station

1 blackouts. So the question -- this recommendation, I take
2 it, is accelerated staff actions, that's NRC staff, not
3 necessarily licensees.
4 DR. KERR: But the way in which one interprets
5 the rule depends on local conditions, and on the plant
6 itself, I believe; that's my impression.
7 COMMISSIONER ROGERS: Well, I think I understand
8 where you are coming from a little better now because it
9 is really the plan itself, as a unit, a kind of monolith
10 that is being imposed. And you are not objecting
11 necessarily to any of the elements of the plan but,
12 rather, the way of proceeding, whether to proceed through
13 IPEs, or through the imposition of this as a generic
14 requirement.
15 Given that, what would you say about the
16 situation though if, for some reason, the IPE plan gets
17 delayed in some way, for any number of reasons, some of
18 which NRC might have no control over? Have you thought
19 about the possibility that if we wrap this directly into
20 the IPE and take no other actions, that there might be
21 some possibility of delays, that might set this back quite
22 a bit? These particular things back?
23 MR. WARD: Well, one thing that is likely to
24 delay the IPE is the imposition of this plan.
25 CHAIRMAN ZECH: Would it be a concern to you if

1 there were delays?

2 MR. WARD: No.

3 CHAIRMAN ZECH: The answer is no, right?

4 DR. REMICK: The statement -- I mean, the staff

5 has made the case that there is undue risk and the

6 modifications are not needed for adequate protection.

7 CHAIRMAN ZECH: Do you agree with that

8 statement?

9 DR. REMICK: Yes.

10 CHAIRMAN ZECH: All right.

11 COMMISSIONER ROGERS: All right. So, you don't

12 see a big problem if there is a delay then?

13 DR. REMICK: Well, of course the delay, if it

14 went out to infinity, I didn't say that would be good but,

15 if we are talking in the time span that the staff was

16 predicting for IPE, no. It's a three to five-year time

17 span, I believe, that they expect, depending on whether

18 people have an existing PRA and they are going to do a

19 level two, or a level three, and so forth.

20 DR. KERR: Well, if 1150 plants are to become

21 part of the IPE, and we were told that there are very

22 likely to be first in line because of the rather extensive

23 analysis that has taken place, one of those plants is of

24 course the Mark I containment. And, presumably, that

25 would give one some experience in seeing what sort of

1 balance of containment performance and core melt frequency
2 reduction is appropriate. And if it turns out that
3 something unexpected develops in the course of that
4 analysis, then one has another look.
5 I think it is obvious to you that we are trying
6 to give you our best judgment.
7 COMMISSIONER ROGERS: Yes, of course.
8 DR. KERR: And in no sense do we think we are
9 necessarily wiser than the staff. We looked at this, and
10 we gave you a considered opinion.
11 As you mentioned, Mr. Roberts, there was no
12 dissent on the part of those participating in the
13 discussion. We did not, certainly, I think that into
14 account what might happen, if there were an extended delay
15 in IPE.
16 Now, I guess if that were to be the case, we
17 would want to have another look. I think that's a
18 consideration.
19 COMMISSIONER ROGERS: You raise some questions
20 about whether the cost estimates -- I don't know whether
21 it is cost estimates or cost-benefit ratios -- probably it
22 is the ratios, although I don't know -- that the cost
23 estimates are not justifiable.
24 Could you elaborate on that a little bit? Were
25 you able to pinpoint anything there that you felt was

1 particularly weak?

2 There is a difference between the industry

3 contractor-based studies and the NRC studies. Did you

4 look at this independently in some way? Did you tend to

5 go more with the industry group's analysis, or what was

6 your guide in coming to this --

7 DR. REMICK: Of course, you certainly have one

8 data point at Pilgrim in which there was a fairly strong

9 estimate there, which differed, basically, from the range

10 of the staff. It is not unusual. The staff, I think

11 traditionally, comes in -- under-estimates industry.

12 Dave, do you have anything?

13 MR. WARD: No, that's all. I think the

14 realities of actually fixing these plants -- I think we

15 often see that the real costs -- they are higher than what

16 -- substantially higher than what would be predicted early

17 on by analysts, when it gets down to the hard, tough

18 hardware, engineering estimates.

19 As we have, as Forest pointed out, there is one

20 firm data point, and there is kind of a disconnect between

21 the estimates and that data point.

22 COMMISSIONER ROGERS: Yes.

23 Do you have anything to say on it, Professor

24 Kerr?

25 DR. KERR: Only that, clearly, this is an area

1 in which there is even more uncertainty than in risk
2 analysis because one is not only the uncertainty in the
3 risk analysis, but also the uncertainty in cost estimates.
4 And the fact that this was done generically, which is
5 probably the only way to do it, if one makes the
6 application generically, it leaves me a bit uneasy if one
7 is serious about the cost-benefit analysis of something
8 going on an individual plant because I think the
9 population density, the characteristics of the plant, and
10 other things, will contribute even more to the uncertainty
11 in the calculation.
12 CHAIRMAN ZECH: Commissioner Curtiss?
13 COMMISSIONER CURTISS: No questions. Thank you.
14 CHAIRMAN ZECH: Dr. Kerr, you've, I believe,
15 answered the question I had about whether any of the
16 staff's recommended improvements might be specifically
17 considered in the category of containment improvements,
18 when you indicated, I believe, that the hardened vent
19 would be in that category, but I think you mentioned that
20 you thought the others would be in the area of core melt,
21 is that a fair characterization of your statement?
22 DR. KERR: Yes, sir.
23 CHAIRMAN ZECH: And I presume then, Dr. Remick,
24 what you have summarized as the ACRS position, is that the
25 ACRS would not necessarily be opposed to the staff Mark I

1 containment performance improvements, if the cost-benefit
2 analysis were performed on a plant-specific basis. In
3 other words, done as part of the IPE program, is that
4 pretty much what your summary is?
5 DR. REMICK: That is correct. We certainly don't
6 differ with the elements of what they propose. We are
7 saying it should be done as part of the IPE, and weighed
8 with what --
9 CHAIRMAN ZECH: You don't really differ with the
10 technical improvements that might come about --
11 DR. REMICK: That's correct.
12 CHAIRMAN ZECH: -- but you do differ with the
13 methodology, if you will, of application generically,
14 rather than on a plant-specific basis, is that correct?
15 DR. KERR: That's correct. I would put it in a
16 slightly different way. I do not differ that any of the
17 things that they have suggested ought to be looked at, but
18 in the context of the things that one would do at a given
19 plant -- whether they would turn out to be the most cost-
20 beneficial I think would depend on an overall analysis.
21 CHAIRMAN ZECH: But you do think some of the
22 improvements suggested, or perhaps all of them, may be
23 applicable to some plants?
24 DR. KERR: Oh, yes, yes.
25 CHAIRMAN ZECH: Do you think that the--

1 considering just the hardened vent, do you think hardened
2 vent -- or have you had a chance to look into it, to the
3 extent you would be confident a hardened vent could be
4 designed such that safety would truly be enhanced and not
5 detracted from?
6 DR. KERR: Speaking for me, the answer is no, I
7 have not looked at it in that detail. You, perhaps,
8 recall that we are doing work on some efforts to write
9 some criteria for containment performance. And we have
10 underway some work that I hope will give us more
11 confidence in recommendations that we would eventually
12 make, but I can't say from my perspective that I am sure
13 that there would be no disadvantages to this. Indeed, I
14 can think of some concerns that one might have, if one had
15 a vent available. And, indeed, if I can be a little bit
16 facetious, I am not sure anybody would ever use a vent.
17 I think the decision to vent is going to be
18 extremely difficult because you have to estimate what is
19 going to happen to the plant, before it happens, in a
20 situation in which things are very uncertain. Even so,
21 from what little I know, I guess at this point I think it
22 probably would be a good idea, but this is based more on
23 -- I am reluctant to use the term "engineering judgment"
24 because, as Harold Atherington (phonetic) once said, "It
25 implies that one is both an engineer and has judgment"--

1 (laughter) -- but gut feeling, or something.

2 DR. REMICK: And intuition tells me that it is a

3 good idea. And the fact that you would be venting from

4 above the suppression pool tells me that it makes sense.

5 We certainly haven't looked to see what kind of valves

6 would be used, and this type of thing, and the reliability

7 of that type of thing, but from an intuition standpoint,

8 it seems like a logical type of thing to head toward.

9 CHAIRMAN ZECH: Well, I think you've made your

10 ACRS position clear. I think it has been helpful to hear

11 from your today, in addition to your paper.

12 Are there any other questions from my

13 colleagues, before we conclude this afternoon?

14 (No response)

15 CHAIRMAN ZECH: Well, let me thank you very

16 much. And I thank you especially for coming to us on

17 fairly short notice. And I know you interrupted your own

18 schedules to do that, representing the ACRS, and I am

19 particularly grateful for you all to be here today.

20 It is a very important responsible decision that

21 is before the Commission. It involves public health and

22 safety. We take very seriously those responsibilities, as

23 you know. We do rely, to a great degree, on the Advisory

24 Committee on Reactor Safeguards. We have great respect

25 for your opinions, your conclusions, your engineering

1 judgments. And we know they are judgments, but the staff
2 has made a judgment, you have made a judgment, now the
3 Commission will have to make a judgment. And we are
4 trying to make the best one that we can, of course.
5 So I appreciate very much --
6 COMMISSIONER CARR: Mr. Chairman --
7 CHAIRMAN ZECH: Yes.
8 COMMISSIONER CARR: I think the ACRS and the
9 staff both agree that we are not fixing something, it may
10 be an improvement to something that is already adequate,
11 is that not correct?
12 DR. REMICK: I am not sure I caught the last
13 words.
14 COMMISSIONER CARR: What's out there is safe
15 enough now, that we don't have to fix something.
16 DR. REMICK: We certainly agree with the staff,
17 that there are not risk outliers, or there is not undue
18 risk, that's right.
19 CHAIRMAN ZECH: And I think the staff made that
20 clear to us, too, but what they have presented to us is an
21 enhancement to safety that they believe can be justified
22 on a cost-beneficial basis, not necessary for adequate
23 safety. I think we all agree with that but, still, I
24 think it is responsible for the Commission to involve
25 itself in enhancements as well as adequacy, and that's

1 what we are trying to do in this regard.

2 It is important to all of us that we really do
3 make a decision that will enhance safety, and certainly
4 not detract from it, but I just want, again, to thank you
5 for an excellent discussion.

6 The Commission will be taking this important
7 matter up, and reflecting on what we have heard from the
8 staff, as well as what we have heard from the ACRS, before
9 we do make a decision, but it is important that we have
10 heard from you today, and I thank you very much for an
11 excellent presentation, and for the continuing advice and
12 counsel from the ACRS.

13 And I hope, Dr. Remick, you will pass the
14 Commission's compliments to your colleagues that are not
15 here with you today. We sincerely appreciate their
16 efforts, their continuing efforts to give the Commission
17 the best technical, engineering, scientific advice that we
18 can have. We need that, and we are grateful to the ACRS
19 for their contribution, for the continuing safe operations
20 of our nuclear power plants, and the other matters that
21 you get in on in the ACRS, but we are grateful to you, and
22 I think we would all appreciate it if you would pass our
23 respects to your colleagues.

24 DR. REMICK: I most certainly will pass it on,
25 and we appreciate the opportunity to come and discuss the

1 matter with you today.

2 CHAIRMAN ZECH: Thank you very much.

3 We stand adjourned.

4 (Whereupon, at 2:44 p.m., the hearing was

5 adjourned.)

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CERTIFICATE OF TRANSCRIBER

This is to certify that the attached events of a meeting of the United States Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING ON FINAL REPORT ON BWR MARK I CONTAINMENT ISSUES
PLACE OF MEETING: ROCKVILLE, MARYLAND

DATE OF MEETING: FEBRUARY 27, 1989

were transcribed by me. I further certify that said transcription is accurate and complete, to the best of my ability, and that the transcript is a true and accurate record of the foregoing events.

Phyllis Young

Reporter's name: Phyllis Young