

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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PERIODIC BRIEFING BY
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

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PUBLIC MEETING

Nuclear Regulatory Commission
One White Flint North
Rockville, Maryland

Wednesday, May 3, 1989

The Commission met in open session, pursuant to notice, at 2:00 p.m., Lando W. Zech, Jr., Chairman, presiding.

COMMISSIONERS PRESENT:

Lando W. Zech, Jr., Chairman of the Commission
Thomas M. Roberts, Commissioner
Kenneth C. Rogers, Commissioner
James R. Curtiss, Commissioner

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STAFF SEATED AT THE COMMISSION TABLE:

Dr. Forrest J. Remick, Chairman, ACRS
Carlyle Michelson, Vice Chairman, ACRS
Dr. Chester P. Siess, ACRS
Dr. Harold W. Lewis, ACRS
Dr. William Kerr, ACRS
David A. Ward, ACRS
Charles J. Wylie, ACRS
James C. Carroll, ACRS
Dr. Ivan Catton, ACRS

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

2:04 p.m.

CHAIRMAN ZECH: Good afternoon, ladies and gentlemen.

Commissioner Carr will not be joining us today.

The purpose of today's meeting is for the Advisory Committee on Reactor Safeguards to bring the Commission up to date concerning the results of its review of four specific matters. First, the intended uses of NUREG-1150, while the report is undergoing peer review. Second, implementation plan for the Safety Goal Policy. Third, the proposed final rulemaking related to maintenance of nuclear power plants. Finally, the Commission has specifically requested the ACRS to discuss its letter of April 17th, 1989 regarding an integrated approach on regulatory matters.

All of these important matters are under Commission consideration at this time. Copies of the ACRS letters relating to these topics are available at the entrance of the room.

Do any of my fellow Commissioners have any opening comments to make?

If not, Doctor Remick, I want to welcome you

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1 and the other members of the Committee. On behalf of
2 myself and all the Commissioners, the work you perform
3 is very important to us. Your views are highly
4 regarded, highly respected, as you know, by the
5 Commission.

6 You may proceed.

7 DOCTOR REMICK: Thank you, Chairman Zech,
8 Commissioners. It's a pleasure for the ACRS to meet
9 with you again today. The last time that we were
10 here, about a month ago I guess, there were only three
11 of us that could make it. But I'm pleased to point
12 out that all of us are here today except for Doctor
13 Shewmon who could not be here.

14 I'd like to also take a moment to welcome
15 Ivan Catton, our most recent member to the Committee,
16 sitting down at the end, and indicate that we
17 appreciate that he's been appointed to the Committee.
18 He's a long-time consultant and is familiar with our
19 activities, but it's a fine addition to our effort and
20 we appreciate it.

21 CHAIRMAN ZECH: We too would like to welcome
22 you, Doctor Catton, and recognize that you're taking
23 on a big responsibility for not only the Advisory
24 Committee but also for the Commission and for our
25 country. We greatly appreciate your willingness to

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1 serve your country. We're grateful to have you on the
2 Committee and we know you'll make a contribution. You
3 have in the past and we welcome you very much to the
4 Board, sir.

5 DOCTOR CATTON: Thank you.

6 DOCTOR REMICK: Chairman Zech, did you want
7 us to proceed in the order in which you identified the
8 topics?

9 CHAIRMAN ZECH: No, any order you'd like to
10 proceed.

11 DOCTOR REMICK: All right. Fine. We had
12 intended to cover the safety goal first.

13 CHAIRMAN ZECH: Fine. I think that's
14 appropriate too.

15 DOCTOR REMICK: All right. I might make a
16 few introductory comments before turning it over to
17 the appropriate subcommittee chairman.

18 I'd like to point out that the ACRS has been
19 a long-time supporter of safety goals, as I believe
20 you know, because we felt that it could help answer
21 the question of how safe is safe enough from the
22 standpoint of regulation of nuclear power plants. We
23 thought it might help truncate the endless search for
24 a zero risk technology, which we know does not exist.
25 We thought that it might help bring some stability and

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1 predictability to the regulatory process.

2 We sincerely applaud the Commission's
3 efforts to issue the safety goal as you've done. I
4 personally feel that there's general acceptance of
5 that safety goal as has been issued, and I find that
6 it has helped me in talking to the public, in
7 describing the qualitative goals and the quantitative
8 health objectives.

9 What I tell them, the members of the public,
10 that if you live near a nuclear power plant, it's
11 anticipated that your risk would be no greater than
12 1/1000ths of the risk of being killed in an accident
13 compared to all other risks that you might have of
14 being killed in an accident, or your chances are no
15 greater than one in a thousand that you'll see fatal
16 cancer or suffer fatal cancer, one-thousands of that
17 compared to cancer from all other causes. The public
18 has an understanding, I think, of that. They don't
19 understand 10^{-5} and 10^{-6} and those type of numbers,
20 but I think there has been general acceptance and some
21 understanding.

22 Now, there are those who would continue to
23 endlessly search for goals that are more to their
24 individual liking. There's no question about that. I
25 can remember a time when the industry said that the

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1 proposed safety goals were far too stringent. I can
2 remember when the staff said that they weren't
3 stringent enough. Well, we think that the time has
4 come now for the Commission to decide, and although
5 the safety goals are being used within the Commission
6 staff in numerous ways that I'm sure you're aware of,
7 we think it's time for the Commission to decide the
8 ways that you want it to be implemented.

9 We've written you many letters containing
10 our advice on how to do that and we came today, at
11 your request, to discuss those views with you, but to
12 remind you that our letters represent our collegial
13 consensus on those views.

14 At this point then, I'd like to turn it over
15 to David Ward, who is Chairman of our Subcommittee on
16 Safety Philosophy, Technology and Criteria, to
17 summarize our letter of 16 February.

18 Dave?

19 MR. WARD: Thank you, Forrest.

20 Our letter of this past February was
21 actually the third in a series of letters that we've
22 written with our ideas of how you and the staff might
23 implement the Safety Goal Policy. The first was
24 written in '87, then '88 and now this most recent
25 letter. So, the Committee has given a lot of thought

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1 to this. I hope our letters have been useful to you.

2 At the beginning we had some rather sharp
3 differences with the proposals that the staff was
4 developing and we think we've come together to a great
5 extend on those over the last two years. There are
6 still a couple of differences between what we suggest
7 in our letter of February and what the staff is
8 presently proposing and I'll talk about those.

9 But first, what I thought I'd do is just
10 summarize briefly where we agree with the staff
11 proposal, because you've heard that and read that
12 recently, and then talk a little bit about the several
13 remaining differences.

14 First, we agree with the present planned
15 proposal of the staff that the Safety Goal Policy
16 should be used to judge the adequacy of the
17 Commission's regulations and not the adequacy of the
18 design and operation of a particular, specific plant.
19 I think this is probably the most important concept
20 for the implementation of the Safety Goal Policy.
21 It's one in which I think there was disagreement
22 between the Committee and the staff two years ago, and
23 I think we now agree that this is the proper use of
24 the Safety Goal Policy, as a tool for evaluating the
25 regulations, not for evaluating the details and making

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1 specifically -- well, as we said, narrowly
2 differentiated decisions about particular plants. So
3 that's very important.

4 The second area of agreement we have is that
5 the several objectives, quantitative objectives that
6 were stated in the Safety Goal Policy could be laid
7 out in kind of a hierarchical logical arrangement,
8 going from abstract to fairly concrete at the bottom
9 of the hierarchy.

10 And the intent there was to, at the
11 uppermost level to have a couple really fairly
12 abstract statements, but statements which mean
13 something, are expressing the Commission's philosophy
14 about reactor safety regulation in a way that's I
15 think clearly understandable to the public and to
16 general policy makers. But then as you go down the
17 hierarchy, you develop goals that can be more
18 specifically applied by the engineers, by designers
19 and operators of the organizations that are operating
20 nuclear power plants.

21 And so we agree with the staff in the
22 development and use of that sort of hierarchy. And in
23 fact, we're in precise agreement on the definition of
24 the first two levels in that hierarchy. We have some
25 difference in the definitions that might be used in

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1 the third and fourth levels, and I'll talk about those
2 in a minute. And finally, we agree with the staff
3 that it would be useful to incorporate certain parts
4 of their implementation plan into the policy itself,
5 so that they have standing and can have a clear
6 standing for the Agency and for the industry in being
7 used.

8 Okay, now the differences. First, in one of
9 the -- I think we called it Level Three of the safety
10 goal is the proposal that plants -- that the
11 probability of an accidental large release from any
12 nuclear power plant should be no more probable than
13 once in a million reactor years of operation. We
14 agree with that, with the once in a million reactor
15 years with the staff's proposal, but we still have
16 some disagreement on exactly what is meant by a large
17 release. We asked the staff to develop a proposal in
18 terms of perhaps a fraction of the core inventory of
19 radioactivity or perhaps in terms of curies, but
20 something that was truly and understandable as a
21 release itself.

22 The staff has proposed that instead they
23 would use a definition which is the release that would
24 cause a single fatality at the plant boundary at this
25 frequency level once in a million reactor years.

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1 Our problem with that is that we lose the
2 advantage of this hierarchical arrangement. As I
3 said, the hierarchical arrangement is to go from the
4 abstract to a more concrete definition of a goal. In
5 going from a higher to a lower level, the intent was
6 to provide for some simplification so that there were
7 concrete numbers that could be used by engineers, but
8 also not to introduce so much conservatism in going
9 from a higher level to a lower level, that there was a
10 de facto new Safety Goal Policy being introduced. But
11 rather that the conservatism introduced should be just
12 enough to accommodate the simplification.

13 Well, we think that the staff's definition
14 of large release in terms of a single fatality at the
15 plant boundary fails that test and is, in essence, too
16 conservative. In fact, it's redundant with the health
17 effect safety goal, but much, much more restrictive.

18 In what we call the Level Four, we have a
19 disagreement in that we wanted to provide in Level
20 Four a means of balancing or providing some sort of
21 honor in the defense-in-depth concept by providing a
22 quantitative goal, not only for the probability of
23 core melt or threat to a containment system, but also
24 in parallel to provide a conditional probability of
25 failure of goal for the actual performance of the

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1 containment system.

2 We felt that with this sort of a safety
3 goal, that this would assure that the regulations were
4 always providing for defense-in-depth in the form of
5 both a containment or mitigation capability and
6 prevention capability in terms of keeping the
7 probability of core melt sufficiently low.

8 The staff does not have in its proposal this
9 balance which we think is necessary. We think it's
10 important. We think that's a rather important
11 difference that needs to be maintained so that the
12 need for defense-in-depth or this balance between
13 prevention and mitigation is fundamentally part of
14 the -- and will be maintained as part of the Agency's
15 regulatory system.

16 We also had some difference in opinion on
17 the quantitative goal that would be assigned to the
18 core damage probability. A number of once in 10,000
19 reactor years has been proposed for existing plants
20 and I think the staff is proposing once in 100,000
21 reactor years, 10^{-5} for future plants. The Committee
22 sees no real reason to make a difference between
23 existing plants and future plants, although within the
24 industry there is some movement to provide design
25 goals for future plants that might have a core damage

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1 probability as low as 10^{-5} . We think that's perfectly
2 sensible, acceptable if that's the industry's choice.
3 But as far as regulating for public health and safety,
4 if 10^{-4} is good enough, and we believe it is, it's
5 good enough for future plants as well as existing
6 plants.

7 One other thing. The probabilistic risk
8 assessments which are necessary for the evaluation of
9 plants or sample plants against the safety goal are
10 limited in their ability to model what I might call
11 the human and organizational performance of the plant.
12 They're quite good at modeling the machine and
13 failures in the machine, but they're limited, they're
14 incomplete in modeling the performance of the humans
15 and organizations in that plant. We know from
16 observation and, I guess, common sense that the
17 performance of humans and organizations is extremely
18 important to the safety of the nuclear power plants
19 you're regulating.

20 So, we suggested that the staff should
21 attempt to come up with some sort of a goal,
22 quantitative, or at least some sort of objectively
23 stated goal for performance of the human and
24 organization component in a nuclear power plant. They
25 weren't able to. We weren't surprised. Frankly, I

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1 guess we really didn't expect them to. What we really
2 wanted to do was wave a flag here and point out that
3 the probablistic risk assessments that are being done
4 are really incomplete in that they're not able to deal
5 in a very comprehensive way quantitatively with the
6 risk contribution from the failures of humans and
7 human organizations.

8 All we're suggesting is that that needs to
9 be called out by -- we suggested some sort of a
10 prominent caveat in the Safety Goal Policy that the
11 evaluation is essentially incomplete in that respect.

12 I think we agree that it's really not
13 practical at this stage, perhaps it never will be, to
14 put any sort of a quantitative goal on organization
15 and human performance. Perhaps some kind of a more
16 objective statement about what the goal might be
17 possible in the future. We're really not ready with
18 that. But we do think that a caveat of some sort in
19 the policy is needed.

20 Of course, that summarizes really the major
21 agreements and differences and perhaps it would be
22 more useful now to take a little time for other
23 members to say something or to respond to comments or
24 questions from the Commissioners.

25 CHAIRMAN ZECH: Why don't we see if you have

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1 other members that would like to comment.

2 DOCTOR REMICK: All right. I see none.

3 CHAIRMAN ZECH: All right. It's very good
4 to think that the ACRS can be that together on their
5 recommendations. I commend you for that.

6 COMMISSIONER ROGERS: Is this the way all
7 your meetings run?

8 DOCTOR REMICK: No, I can assure you not.

9 CHAIRMAN ZECH: I wish the Commission could
10 always be that sure.

11 DOCTOR REMICK: I think it will fall down as
12 we go along today.

13 CHAIRMAN ZECH: Yes.

14 DOCTOR LEWIS: You corrupt us at noontime.

15 DOCTOR REMICK: As I say, we've been working
16 on this for two years. We've had a lot of discussions
17 about it.

18 CHAIRMAN ZECH: Well, I'm sure you have and
19 I appreciate it very much.

20 Well, before we move on then, let me see if
21 there are questions from my fellow Commissioners.

22 Commissioner Roberts?

23 COMMISSIONER ROBERTS: No.

24 CHAIRMAN ZECH: Commissioner Rogers?

25 COMMISSIONER ROGERS: Just how you think

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1 about incorporating guidelines into the policy. You
2 didn't say very much about that in your letter of
3 February 16th. You did touch on it. But I wonder
4 what your -- if you could say just a little bit what
5 your thinking is.

6 MR. WARD: We really didn't consider it that
7 much. The staff had suggested that by amendment to
8 the policy statement that some of the parts of this
9 implementation plan that kind of flush it out, make it
10 more of a whole should actually be put into the policy
11 statement. I think we don't -- we think that would be
12 a good idea. We don't have any problem with it, but
13 we don't really have a lot of comments about it.

14 COMMISSIONER ROGERS: Well, I noticed in
15 your letter of February 16th that you -- in talking
16 about a definition of adequate protection, you said
17 that you "believe the safety goals should be used to
18 judge the adequacy of the regulations from the
19 standpoint of whether those regulations result in
20 classes of nuclear power plants which can be and are
21 operated in such a way as to meet the safety goals and
22 thus provide adequate protection to the public."

23 I wonder whether that word "classes" had
24 some significance, particular significance. When I
25 noted your comment on the incorporation of guidelines

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1 into the policy, whether there was some connection
2 there between --

3 DOCTOR REMICK: I don't think there was a
4 connection between the two.

5 COMMISSIONER ROGERS: You saw something
6 there.

7 DOCTOR REMICK: But classes, we generally
8 talk about the population of plants, but realizing
9 when you say that there are such differences as Fort
10 St. Vrain that might be different than a Mark I BWR
11 and so forth. So, whether you could take all 109 or
12 10 plants as a population or whether you need to take
13 several subsets of those because of different designs,
14 and that's where I think we use the word "class."

15 Hal, do you want to answer that?

16 DOCTOR LEWIS: No, I think you're right. I
17 do think it's an important point because the history
18 is that there's a tendency on the part of the staff to
19 want to have guidelines for regulation and regulation
20 inevitable occurs at the small number level, either
21 individual small groups of plants.

22 When we first heard about one of the early
23 briefings about the safety goal, the staff was taking
24 the position that there was nothing to be learned from
25 a group of five PRAs that could be extended throughout

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1 the community. I think the term "class," in addition
2 to taking into account that there are different groups
3 of class, as Forrest said, is meant to be a little bit
4 fuzzy but to say, you can learn something for five
5 plants about all of them. You don't have to have a
6 PRA on every plant in order to learn about the group
7 of plants, but you have to use some judgment, just as
8 you do in any sampling procedure.

9 A reasonable example is two and a half times
10 as many as went into watch 1400 but it's not the whole
11 collection. So you can judge the adequacy of the
12 regulatory cluster by looking at -- of course you get
13 more information if you looked at ten, and even more
14 if you looked at 30, but there's room for judgment in
15 there in dealing with groups of plants. The trick is
16 to not do it on each plant.

17 MR. WARD: I don't know if that explains it.
18 There are two different questions here. Our point was
19 that if we have some PRA results from a group of Mark
20 X containment plants and let's say we've done PRAs on
21 a couple of these plants, and we have some reason to
22 believe that some characteristic of those plants that
23 might be common to all of them is causing the risk to
24 be somewhat higher than would seem to be acceptable
25 under the safety goal. What we're suggesting is that

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1 the staff should look at its regulations by which
2 those plants were designed and licensed and find
3 what's inadequate in these regulations. Should the
4 regulations have required another system here or
5 something. That's the approach.

6 Rather than look at an individual plant and
7 say, "Hey, you've got to put in another system of a
8 certain kind," the staff should back off and say,
9 "Look, we've been telling people that if they built
10 plants to our regulations, they'll be adequately
11 safe." So, what we want is to look at those
12 regulations then and find out why this class of plants
13 isn't coming out, if that question has arisen.

14 COMMISSIONER ROGERS: I wonder if you could
15 just enlarge a little bit on this question of the use
16 of the safety goals in judging the adequacy of
17 regulation. We've heard from the staff and its point
18 of view on this. I'd like to just have you review
19 that very briefly again, if you would, from your point
20 of view as to what that really means, how one uses the
21 safety goals to judge the adequacy of regulation.

22 DOCTOR REMICK: I think the staff has
23 misunderstood what we're saying here. When I read I
24 think what they have written in the SECY document
25 ending in 102, I guess it's 89-102 or 88-102, and

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1 reading some of the transcripts from our meeting with
2 you, they have the opinion we're saying you have a top
3 down force fit of safety goals on individual
4 regulations, see if they meet the safety goal. That
5 is not what we're saying.

6 I think Dave has just indicated what we had
7 in mind, and that is that from our perspective, and of
8 course we like to act like lawyers, we think that
9 adequate protection is compliance with the
10 Commission's regulations. But how do you know that
11 the regulations are providing plants that are
12 adequately safe from the public health standpoint? We
13 say, "Well, if you find using the safety goal that a
14 preponderance of the population of plants out there
15 meets that safety goal, what you say is safe enough,
16 then presumably the regulations must be adequate."

17 But suppose you find that that population of
18 plants is generally not meeting the safety goal. Then
19 you have to ask yourself the question, "What is it
20 about our regulations? Are there additional systems
21 for decay heat removal or what is it that we must do?
22 Must we improve training and so forth so that we do
23 increase the safety of that class of plants?

24 So, that's how we're saying you would use
25 the safety goal to judge whether those regulations are

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1 doing the job that you think they're doing.

2 COMMISSIONER ROGERS: It's some kind of a
3 sense of a mean then?

4 DOCTOR REMICK: Yes. I'll look to our
5 statistician if that's a proper use of mean in that
6 case.

7 DOCTOR LEWIS: The point is, I think, we're
8 all in agreement on this general point, but we have
9 different emphases. The way I try to keep it straight
10 in my own head, not very successfully of course, is
11 that the safety goal I think of as more a tool for the
12 Commission than a tool for the Commission staff. That
13 is, the Commission staff is involved in a regulatory
14 process which is necessarily a deterministic process.
15 They can't look at everything they do and ask, "Well,
16 does the bottom line mean meet \$1,000.00 a man REM or
17 doesn't it?" We've had people stand up in front of us
18 and say, "This one loses because it's ten percent
19 over," and of course that's no way to regulate an
20 industry because those numbers are good to a factor of
21 ten anyway.

22 But for the Commission to look at the way in
23 which the -- not only the written regulations but the
24 implementation of the regulations as applied to the
25 industry and how it provides an industry which is

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1 reasonably safety, that's what the safety goal, in my
2 mind, is for.

3 The problem is that the Commission doesn't
4 have the resources, except through the staff, to do
5 this job. And therefore, the staff has this double
6 job of evaluating itself on behalf of the Commission,
7 but also doing its job. They mix them up and I'm not
8 surprised. I would too if I were in that job.

9 So, that's, I think, the confusion we're
10 groping with around here.

11 CHAIRMAN ZECH: Well, that's why we call on
12 your to get your views, of course, to try to give the
13 balance to that --

14 DOCTOR LEWIS: Gee, I thought you had to.

15 COMMISSIONER CURTISS: But on that point, I
16 guess I understood the staff's discussion a little bit
17 differently. When you say the safety goal would be
18 used as a mechanism for defining the mean or it would
19 be used against some benchmark. As I understood the
20 staff, their concern with that was that the safety
21 goal in the ACRS' vision would be applied to define
22 adequate protection or the benchmark or mean that you
23 would use would be the statutory standard. Whereas I
24 understood them to say that it would be used as an
25 adjunct to the back-fitting process. That leaves the

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1 question of how you define adequate protection.

2 But is there a difference between the two of
3 you on that point?

4 MR. WARD: Here's what we said in the
5 letter. "We believe that the safety goals should play
6 an important but indirect role in defining adequate
7 protection. Ideally, compliance with the Commission's
8 regulations is a suitable surrogate for defining
9 adequate protection of the public. However, we
10 believe that the adequacy of regulations should be
11 judged from the viewpoint of whether nuclear power
12 plants as a class, licenced under those regulations,
13 meet the safety goals."

14 I'm just saying the same thing again.

15 DOCTOR REMICK: That isn't what the staff
16 says we're saying, as I interpret what they're saying
17 we said, but that's what we mean. It's an indirect
18 use to judge the effectiveness of the regulations.

19 COMMISSIONER ROGERS: I think they are
20 saying that now. I think that is very close. That's
21 why I wanted to hear from you because I think that's
22 what I did hear from the staff the last time.

23 DOCTOR SIESS: I think the biggest
24 difference between the staff and the ACRS on the issue
25 of adequate protection is that the staff has lawyers

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1 and we don't.

2 CHAIRMAN ZECH: That the staff what?

3 DOCTOR REMICK: Has lawyers.

4 DOCTOR LEWIS: Of course we've asked for
5 them, but we've been denied them.

6 COMMISSIONER ROBERTS: You don't know when
7 you're well off.

8 CHAIRMAN ZECH: In defense of the lawyers,
9 let's just say that sometimes the lawyers make a very
10 valuable contribution to this Commission. So, we
11 appreciate your thoughts, but they do help us.

12 DOCTOR REMICK: Incidentally, you remind me
13 of something too. We say the staff and we differ with
14 them, but the last year or so, Wayne Houston from the
15 staff has been heading up the efforts and he has
16 interacted exceedingly well with the Committee. He's
17 spent hours and hours with us, and which at times it
18 gets testy and so forth, but he's taken it and he's
19 been very receptive and he's tried.

20 CHAIRMAN ZECH: Good.

21 DOCTOR REMICK: Of course he isn't the
22 entire staff, but really, I respect the effort he did
23 with the Committee.

24 CHAIRMAN ZECH: I'm pleased to hear that.

25 Commissioner Rogers, anything else?

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1 COMMISSIONER ROGERS: No, that's fine.

2 CHAIRMAN ZECH: Commissioner Curtiss?

3 COMMISSIONER CURTISS: Just one other
4 question. Would you read the large release in the
5 core damage guidelines that the staff has proposed as
6 implying a containment performance standard or is
7 there still a shortcoming in that regard?

8 MR. WARD: No, I don't think it does because
9 that -- conceptually you could have a plant that would
10 meet that requirement without having a containment.

11 DOCTOR REMICK: That's right.

12 MR. WARD: That's a problem with those
13 things.

14 DOCTOR LEWIS: I should mention the other
15 agency. This came up at another agency and produced a
16 brouhaha because if you define a large release in
17 terms of a prompt fatality at the plant boundary,
18 Chernobyl was not a large release and I don't know
19 anybody who believes Chernobyl was not a large
20 release.

21 So, it doesn't help to put the definition of
22 a large release several layers down. Why not define
23 the large release as a large release? It makes a kind
24 of simplistic sense.

25 COMMISSIONER CURTISS: I guess I -- go

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1 ahead.

2 MR. CARROLL: It also -- which is something
3 that you really want to get away from.

4 COMMISSIONER ROGERS: If you do it in terms
5 of fatalities.

6 MR. CARROLL: Yes, right.

7 COMMISSIONER CURTISS: One other question on
8 the issue of distinguishing between existing and
9 future plants. A number of initiatives going on
10 around here that make exactly that distinction, and
11 based upon what I think is a fact that the level of
12 safety is increasing, that we've discovered new ways
13 to do things. There's kind of a logic to that, to say
14 that the safety goals for existing plants might
15 inherently be different given the state of the art
16 that's developing for future plants.

17 What's behind your statement on that?

18 DOCTOR REMICK: That goes to the question of
19 -- the Commission has said they have expressed what
20 they think is safe enough, and I don't think that is
21 conditioned upon it's this type of reactor or today's
22 reactor or the reactor ten years from now. I think
23 the Commission has spoken of what they think from a
24 public health and safety standpoint is safe enough,
25 and you've expressed that.

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1 Why would it be conditioned that you would
2 lower that in the future, unless you felt that that
3 was inadequate health and safety for the public? I
4 don't think you believe that. So what's the reason
5 for changing the answer of how safe you think is safe
6 enough from a regulatory standpoint for future plants.

7 COMMISSIONER CURTISS: That may go to the
8 distinction that the staff drew at the meeting where
9 I'm sure they would define how safe is safe enough in
10 terms that align it as closely with adequate
11 protection, that all the plants existing in future
12 would meet that standard. But as we learn new things
13 and develop new designs, that inherently these new
14 plants will be safer without saying that existing
15 plants don't meet the statutory standard.

16 DOCTOR REMICK: I think that the future
17 plants will be safer. But the question is, just
18 because they can be safer, do you regulate that lowest
19 level all the time or do you answer what we think is
20 safe enough and then let economic considerations and
21 other things enter in to individual licensee's
22 decisions on how far they go beyond those.

23 But I think there is a natural reaction out
24 in industry. Every time they improve something, the
25 Commission coming in and wanting them to regulate

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1 that. We've seen that in the accreditation process,
2 in maintenance and so forth. The natural tendency as
3 things improve to want to come in and place a limit,
4 sometimes that kills the incentive to try to improve.

5 So, I think it boils down to the question,
6 do you think that the safety goals express adequately
7 how safe is safe enough from the standpoint of nuclear
8 power plants in this country? If you don't, then
9 maybe it should be lower in future years.

10 CHAIRMAN ZECH: The Commission consistently
11 opposed the inclusion of averted on-site cost and cost
12 benefit analysis and it's been debated for some time,
13 that issue. Do I understand correctly that the ACRS
14 supports the inclusion of on-site costs if a safety
15 cost benefit analysis is done?

16 MR. WARD: Yes.

17 Do you want to elaborate on it?

18 DOCTOR REMICK: Basically, we're saying that
19 giving credit for averted on-site costs against the
20 other costs is economically acceptable type of thing
21 in a cost benefit analysis, if you do a cost benefit
22 analysis. We're separating that from safety goal, but
23 saying if you do cost benefit analyses, whether it's
24 under DPA or whether it's under --

25 CHAIRMAN ZECH: Yes, I see.

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1 DOCTOR REMICK: -- rule or whatever, we do
2 not differ with the staff's view, and apparently OGC's
3 view, that basically subtracting that from the total
4 costs of the proposed modifications, we think that's
5 acceptable.

6 CHAIRMAN ZECH: In a cost benefit analysis
7 situation, but you do differ from the safety goal
8 itself as far as that's concerned. You're not
9 considering that?

10 DOCTOR REMICK: We've associated a cost
11 benefit analysis --

12 CHAIRMAN ZECH: Yes.

13 DOCTOR REMICK: -- as a part of a safety
14 goal.

15 CHAIRMAN ZECH: Right. Okay. I understand.
16 Good.

17 Well, let me just say that this has been a
18 long considered subject, I know. I have, frankly,
19 felt that your consistent stance that the safety goal
20 should be a judge of our regulations rather than a
21 plant specific measure is proper. I think I've also
22 felt rather consistently that the safety goal is just
23 that, it's a goal. It's a goal. The struggle that
24 we've had and the staff has had, I know, that you have
25 helped us with is how do you implement a goal. It's

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1 been very difficult. But I think your contribution
2 and your collective thinking on this has been very
3 helpful to try to at least temper the effort on the
4 part of the staff, which you're absolutely correct, to
5 try to define things. I would do the same thing if I
6 was on the staff, as Doctor Lewis points out, he would
7 too, because you want to know what specifically do I
8 have before me and what are the specific guidelines?

9 The safety goal doesn't lend itself
10 completely to that type of a formula. Therefore--
11 and I don't think it properly should. I think that's
12 the ACRS position too.

13 So, I do feel that the goal is a goal. I
14 think it's a commendable achievement on the part of
15 the Commission with the help of the ACRS and the staff
16 and taking the next step as to how we should implement
17 it is indeed worth the time we've spent on it, I
18 think, because it is before the Commission. We'll
19 hopefully make the best decision that we possibly can.
20 Your input will be greatly respected and reviewed by
21 all of us, I'm sure, again carefully.

22 We appreciate all the letters that you've
23 given to us, all the time you've spent on this very
24 important subject. I think it's, frankly, been worth
25 the time. I appreciate your willingness to work and

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1 review the staff's effort. The staff, I think, has
2 done a commendable job too. They are indeed coming at
3 it from a little different approach. Again, that's
4 understandable.

5 But I think we have come together to the
6 point where perhaps the Commission can feel reasonably
7 confident to make a decision on how best to implement
8 this very important safety goal.

9 So, let me just move onto the next subject.
10 But before we do, I can't help but say how much the
11 Commission appreciates the careful thought, the honest
12 thought and I know some of the differences that you've
13 had amongst yourselves in order to come to the
14 recommendations that you've brought to the Commission.
15 But we appreciate very much your contribution in this
16 important area.

17 DOCTOR REMICK: Thank you, Mr. Chairman.

18 The next item then is the maintenance rule
19 that we had planned to discuss. As you know, we have
20 provided the Commission with two letters on the
21 proposed maintenance rule.

22 We were made aware this morning of your memo
23 of 26 April to the other Commissioners and that places
24 a little different color on what we had planned. We
25 had planned to ask Carlyle Michelson, the Chairman of

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1 our Subcommittee on Maintenance Practices and
2 Procedures, to summarize our letter to you of 11
3 April. But I'm not sure if that's the appropriate way
4 to proceed or if you would prefer us to go ahead in
5 that mode, or if you just want to open it up for
6 questions that you might have.

7 CHAIRMAN ZECH: No, I think we ought to ask
8 Carl if he wouldn't mind summarizing the approach. We
9 recognize we've given you a little different way to
10 look at it now. But perhaps you could weave that into
11 the thoughts you have and I think we'd benefit from
12 your views.

13 MR. MICHELSON: Well, first, I would like to
14 just go back and refresh your memory on the two memos
15 that we did send to you on the subject of maintenance.
16 The first one was sent in September of 1988.

17 In that letter, we stated, I think quite
18 clearly, that we did not support the proposal to
19 establish a maintenance rule and gave two particular
20 reasons. The first reason was that the -- we asked
21 two important questions and those were the reasons for
22 our conclusion. The first question was, does the
23 maintenance rule of nuclear power plants as now
24 performed pose a significant risk on public health and
25 safety? The second one, would the existence of a

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1 maintenance rule reduce that risk? Those were the two
2 things that we were groping with.

3 On the first question, we felt that there
4 was some indication that poor maintenance had
5 contributed to plant unavailability and in some cases
6 to the existence of plant states that could be
7 interpreted as possible accident precursors. However,
8 we did not see any evidence to support the idea that
9 the existence of a maintenance rule would reduce this
10 risk, nor did we see any evidence that the existence
11 of a rule would make things any worse.

12 It appeared to us that the maintenance
13 practices in the industry were improving and that the
14 rule might be disruptive to the substantial industry
15 initiatives that had been developed to accomplish this
16 purpose. So, at that time we indicated we felt that
17 it was not necessary to have a maintenance rule.

18 On April 11th, we sent you a second letter,
19 this time concerning the draft Commission paper
20 related to final rulemaking. In that letter we
21 indicated that our position remained essentially the
22 same. We still believe that good maintenance is a
23 necessary ingredient in any operational program that
24 seeks to insure reliable and safe plant operation, but
25 we felt that that was really not the issue. We

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1 believe the issue was how to obtain good maintenance.

2 As we see it, the industry's aggressive
3 emphasis on the development of effective maintenance
4 programs over the past several years has resulted in
5 marked improvements in maintenance programs and
6 significance progress towards reaching the industry's
7 objectives.

8 Further, the staff has told us that their
9 evaluation of a sample of maintenance programs
10 indicates that only a few percent of the total
11 population of U.S. operating plants may have poor
12 maintenance programs. That conclusion was based on
13 examining about 25 percent of the total plants.

14 Given an environment in which there is
15 already a scarcity of industry and NRC resources, we
16 believe that it is more cost effective to seek
17 improvements applicable to the few plants with poor
18 maintenance programs by means of existing regulations
19 rather than burdening all plants with a costly program
20 of unproven efficacy.

21 The scope of the proposed final rule is also
22 a concern to us. The rule, and its accompanying
23 regulatory guide, appeared to be very broad in scope.
24 So broad that almost every facet of plant operation
25 might conceivably be under the scrutiny of the NRC on

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1 the basis of its effect on maintenance. Such a broad
2 scope could be counter productive.

3 Because everyone involved believed that
4 maintenance programs are improving and because the
5 industry is committed to additional improvements, we
6 recommended that the staff continue to monitor the
7 industry's progress and not to intervene at this time.
8 That was the bottom line of our second letter and
9 that's where we're at now.

10 CHAIRMAN ZECH: All right. Thank you very
11 much.

12 Are there any other comments from the group,
13 Committee? Thank you.

14 Commissioner Roberts?

15 Commissioner Rogers?

16 COMMISSIONER ROGERS: Do you think that the
17 industry efforts, which indeed have been significant
18 in the last few years and have made very important
19 differences in a number of plants, and are being taken
20 up by most of the licensees in some form or another,
21 do you think those efforts would have come on at the
22 pace and intensity that they have if there had not
23 been an NRC initiative towards a maintenance rule?

24 MR. MICHELSON: You're asking me my personal
25 view because we did not entertain that as a Committee

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1 question.

2 COMMISSIONER ROGERS: I think some of
3 your -- yes, I guess -- anybody can answer.

4 MR. MICHELSON: I will indicate my own views
5 and then the other members can indicate their views.

6 I believe that a lot of the activity
7 associated with improved maintenance had been going on
8 before the real push for a maintenance rule. The
9 question then is would that level -- I think INPO was
10 one of the prime movers of trying to get some of the
11 maintenance going because maintenance clearly was
12 showing up in LERs as a significant contributor to
13 events of concern.

14 The industry was picking through INPO. Now,
15 the question is, would they have continued to build
16 the momentum that I think they are now building if the
17 NRC hadn't come through with a similar thrust from
18 their direction? My own opinion is I doubt that it
19 would have proceeded to the level that it is now
20 without some additional impetus from the NRC. But
21 clearly, there were significant programs underway.
22 It's a question of whether you could keep them up over
23 the long term.

24 DOCTOR REMICK: I agree with what Carl is
25 saying. Several of us -- I don't know how many years

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1 ago it was now, but several of us in ACRS accompanied
2 the NRC staff on a bilateral visit to Japan. Harold
3 Denton headed up that effort and I know we were so
4 impressed with what we saw in Japan and saying now,
5 "What do we do with this information?" I think all of
6 us felt if we could somehow get U.S. utilities to go
7 and see the maintenance practices and see the effects.
8 I think back then people started, they did, and some
9 utilities worked out relationship with individual
10 utilities in Japan.

11 I then later on had an opportunity go along
12 with an INPO visit with Dennis Wilkinson and my
13 accrediting board activities, looking at training and
14 so forth. Once again, we were sincerely impressed.
15 So, INPO came back and put the pressure on for more of
16 this. Then I think the whole accreditation process
17 where maintenance programs now must be accredited so
18 that utilities have established formal programs and
19 have laboratories and they're looking at the qualities
20 of personnel and so forth, I think all of that has
21 helped. But, like Carl, I think the interest of the
22 Commission and perhaps the threat of a rulemaking and
23 so forth probably has pushed that along faster than it
24 otherwise would. But I think it started some years
25 ago.

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1 COMMISSIONER ROBERTS: Well, that may be.
2 How long ago was it you went on that trip to Japan
3 with INPO? That's been --

4 DOCTOR REMICK: It's probably four years
5 ago.

6 COMMISSIONER ROBERTS: Yes.

7 DOCTOR REMICK: And the NRC visit was before
8 then. It was about two years before then. So, I
9 would guess the NRC visit was '82, '83. There were
10 several others went along. But I think that helps --

11 COMMISSIONER ROBERTS: When did the notion
12 of rulemaking on maintenance arise?

13 DOCTOR REMICK: That I can't answer.

14 MR. WYLIE: I think it's at least three
15 years ago.

16 MR. WARD: About four years ago, I think.

17 MR. WYLIE: I recall when it first came up.
18 There were meetings with the staff and industry at
19 that time. That's at least three years ago.

20 MR. WARD: I think there's no doubt in this
21 and other areas, the threat of rulemaking has
22 sometimes spurred industry, concentration of industry
23 action. I don't know that I like all the conclusion
24 one draws from that, but I think it's true.

25 DOCTOR REMICK: I think you have to point

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1 out a down side to all of that too. Just the threat
2 of rulemaking has diverted some industry resources to
3 try to counter that. On the other hand, coming from
4 industry a few years ago, I would comment that
5 actually improving maintenance, at least in my
6 perspective, was one of the first initiatives industry
7 or INPO came up with along with training. I think
8 they've been pushing that for a long time.

9 DOCTOR KERR: I'm reminded of one occasion
10 on which Mark Twain said, "I was glad to be able to
11 answer that question promptly and I did, I said I
12 didn't know."

13 DOCTOR LEWIS: Could I just add one little
14 bit to this? I think, if I remember correctly, that
15 one of the things that impressed people on the Japan
16 episode was a fundamental difference in terms of
17 frequency of maintenance and depth of maintenance.
18 There's a tradeoff about how often you test and
19 maintain things against how deeply you go into them.
20 There's something to be said for frequent observation
21 and something to be said for shutting everything down
22 every six years and taking it apart and putting it
23 back together. Of course, when you do that, that's
24 the riskiest part of the operation, when you start it
25 up again. You know that from your overhauls at Naval

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1 shipyards. I've been through that too.

2 One thing I always emphasize, and I would
3 feel derelict if I didn't at this point on this, is
4 that there is a real well developed academic body of
5 information that addresses this question, called the
6 theory of reliability. There are professors of
7 reliability. There are books about that, that deal
8 with the general issue of how you determine what
9 proper levels are.

10 We say that if you look at LERs, there are
11 many incidents that are caused by maintenance. There
12 are also many incidents caused by testing, by
13 excessive testing where maintenance is not necessary.
14 The trade there is one that cannot be made by sitting
15 around a table. You have to apply some reasonably
16 good doctrine. There exists such doctrine and I don't
17 mean this as a slap at the staff, but I have a feeling
18 that it is better known outside the NRC than it is
19 inside the NRC. This is just an admonition to use the
20 best of the art out there in dictating this matter.
21 So, it's not just a matter of a maintenance rule, it's
22 what rule it is.

23 COMMISSIONER ROGERS: I know in one of your
24 letters you've commented on the -- that the proposed
25 rule really got into what amounts to management

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1 questions and you were sensitive to that. I'll just
2 ask the question in general. Doesn't all regulation
3 intrude on management? I don't think that you can
4 have regulation without its being in some way partly a
5 management function because those are the kinds of
6 things that a good management does.

7 So, I'm not sure that there is a clear line
8 of demarkation between regulation and management.
9 We'd all like to think there could be and that we can
10 always stay on one side of it, but I don't believe
11 there is a sharp line, that there's always a fuzzy
12 boundary there and that regulation is always going to
13 be intrusive on management prerogatives because it
14 sets a different set of priorities than the management
15 might necessarily have.

16 So, I don't think you can totally divorce
17 regulation from management. We can't have that clean
18 a separation. It's a question of how far is far
19 enough and no further.

20 DOCTOR KERR: But I think it's very
21 important that one keep the two responsibilities
22 clearly in mind because otherwise the regulators who
23 are generally not responsible for management take all
24 that responsibility.

25 COMMISSIONER ROBERTS: As usual, I agree

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1 with you.

2 DOCTOR KERR: So, although I agree with you
3 the boundary may be fuzzy, when you get far away from
4 the boundary, which one can do occasionally, that is
5 not always so fuzzy.

6 COMMISSIONER ROGERS: But I think it's just
7 not quite so simple, that it is a very sharp line
8 there. The very fact that you have regulation is
9 intrusive and it sets constraints on management that
10 management might not give the same priority to without
11 regulation, in any industry. But it is true that
12 regulation should not attempt to manage because it
13 can't do it. It doesn't have the tools, it doesn't
14 have the responsibility. So, there is a clear
15 difference in those two sectors, but there's an
16 overlap there as well.

17 DOCTOR KERR: It's for reasons like that
18 that one has an astute and wise Commission to make
19 decisions of this kind.

20 CHAIRMAN ZECH: We hope so.
21 Anything else?

22 COMMISSIONER ROGERS: No, that's fine.

23 CHAIRMAN ZECH: Commissioner Curtiss?

24 COMMISSIONER CURTISS: I do have one quick
25 question.

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1 We've got the first batch of results in from
2 the maintenance team inspections and the staff briefed
3 us yesterday on those. I guess the thing that jumped
4 out at me is that the utilities do a pretty good job
5 of putting maintenance programs together. Of the 20
6 sites that were surveyed in the first batch, we had
7 pretty positive results on the formulation of
8 programs, but there was a clear break between the
9 formulation of the program and its implementation. I
10 don't think I'm telling you anything new that you
11 probably haven't heard or seen in this country at
12 least.

13 Given what you've seen, do you have the same
14 high degree of confidence on the implementation side
15 and would you counsel the same sort of "wait and see,
16 let the industry pursue it" as you've alluded to in
17 your two letters?

18 MR. MICHELSON: I think the first thing you
19 have to recall, of course, is that we have mechanisms
20 for monitoring the quality of maintenance, the SALP
21 process in particular. This is, I think, a very
22 strong process, very effective, and it's keeping up
23 with the on-site maintenance, with or without a big
24 paper program behind it.

25 So, I would not personally have a concern

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1 that poor maintenance is going to go on even though
2 maintenance programs look good, because I believe the
3 SALP process, the resident inspector process, there
4 are several checks and balances that assure that we're
5 still watching how maintenance is being done. It's
6 just a question of the formality of the program and
7 it's in its basis and regulation that we're really --

8 MR. CARROLL: One of the things that the
9 staff presented to us at our request, I don't know if
10 they showed it to you, was an attempt to correlate how
11 well they viewed the maintenance programs through the
12 special team inspections with SALP, engineering,
13 maintenance, surveillance and also performance
14 indicators that you might intuitively think have
15 something to do with how good a maintenance program
16 one has. I guess my reaction to that was that the
17 correlations weren't very good.

18 COMMISSIONER CURTISS: Actually, the
19 question came up yesterday and we asked them what kind
20 of correlation they had with the SALPs in the first 20
21 or 30 that they've done and the answer, I think, was
22 that there seemed to be a high degree of correlation,
23 at least with the SALPs. I don't recall the answer on
24 the performance indicators.

25 COMMISSIONER ROGERS: SALPs, on the other

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1 hand the other indicator is not so good. There seemed
2 to be a mixed answer there, just as we --

3 MR. MICHELSON: I think most of the -- see,
4 their statement was based on these management
5 inspection team results which I think are only now
6 coming in. That's a fairly recent process. So,
7 perhaps that wasn't reflected in some of their
8 observations, conventional performance indicators and
9 so forth, although we did discuss SALP as well.

10 DOCTOR KERR: I have not seen the report to
11 which you refer. Perhaps it's been looked at by one
12 of our subcommittees. I would want to look at it in
13 detail before drawing any conclusions. I think your
14 question is certainly well taken.

15 For example, one could say that the
16 implementation of the maintenance program is not very
17 good by looking at the details of the program itself
18 and going through detail by detail and finding that
19 some of the details are not being carried out.

20 On the other hand, one could look at plant
21 performance and see if it is improving. I don't know
22 what criteria were used in making a decision that the
23 implementation is not very good. I think measuring
24 implementation is difficult and a number of criteria
25 could be used. I certainly think it is an area to

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1 which the staff needs to give continuing attention.
2 But I would say this early, the measures for
3 determining --

4 COMMISSIONER ROGERS: Well, one of the areas
5 that stood out was the poor engineering support for
6 maintenance programs, that somewhere between 25 and 30
7 percent of the programs that they've looked at had
8 maintenance overall programs, had a program but the
9 implementation of that was inadequate. That was one
10 of the areas.

11 DOCTOR KERR: Well, I don't know. I just--
12 with all due respect to our staff, which I think is
13 competent, I'm not sure how many of them have a lot of
14 experience in running maintenance programs. Well,
15 I've said enough. I think the question you ask ought
16 to be examined continually.

17 COMMISSIONER CURTISS: It's a fair question
18 of what you look at to measure maintenance with
19 respect to the staff's approach. They did say, and I
20 think it's a credit to the approach that they've taken
21 with the tree that they formulated, but it covers many
22 of the same things, maybe from a different
23 perspective, but many of the same things that the INPO
24 evaluations cover. So, there does seem to be a
25 consensus at least between the NRC staff and INPO as

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1 to the things that are critical to look at it. They
2 seem to be looking at the right things, I think.

3 MR. MICHELSON: Well, it's encouraging that
4 the SALP process, at least, is kind of fitting with
5 the --

6 COMMISSIONER CURTISS: Yes. I was very
7 pleased to hear that because it calibrates both the
8 SALP process --

9 MR. MICHELSON: That was one of the
10 questions that apparently has now been settled.

11 DOCTOR SIESS: You know -- may I?

12 CHAIRMAN ZECH: Please.

13 DOCTOR SIESS: It seems to me that the
14 evaluation of maintenance programs is not all that
15 much different from the evaluation of a QA program.
16 One thing you can do as a measure is to say, "Did you
17 do what you said you were going to do?" That's fairly
18 easy for somebody to check up on. It might be if we
19 had a maintenance rule, "Did you do what we told you
20 to do."

21 The other measure would be how reliably
22 and/or how safely the plant is operating because the
23 objective of maintenance is to provide a safe and
24 reliable plant. The objective is not simply to carry
25 out all the steps in a plant. Now, if the

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1 relationship between that an a QA program isn't
2 obvious, I'll explain it some other time.

3 COMMISSIONER CURTISS: I think that's a fair
4 point. They do have some very gross measures of plant
5 performance. But one of the things that we found
6 yesterday was that there's very little viability
7 trending on key systems and components. The utilities
8 have the paperwork, but they really haven't looked at
9 trending that information.

10 DOCTOR SIESS: Like QA.

11 COMMISSIONER ROGERS: Well, just on that
12 point though, you're absolutely right that if the
13 plant starts to show all kinds of evidence of problems
14 that one could trace back to maintenance, then you've
15 got a sure indicator that you've had a bad maintenance
16 program, but you've also got a problem on your hands.
17 The idea would be to try to avoid getting to the point
18 where poor safety performance of the plant is the
19 indicator that tells you you've got a bad maintenance
20 program.

21 MR. WYLIE: Before we leave that, let me
22 make one comment. Carl spoke to it in regard to the
23 scope of the proposed maintenance rule and the reg.
24 guide. One thing that disturbed us was the broad
25 scope of both. The definition of what was to be

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1 included in the program was anything that could cause
2 a transient that would challenge the plant's safety.
3 With that broad a definition, there was just no limits
4 to the bounds of that rule or the reg. guide.

5 You could take it so far as to mean the
6 transmission lines that come into the plant would fall
7 under that definition.

8 DOCTOR SIESS: Of course one of the biggest
9 causes of plant transients is maintenance.

10 COMMISSIONER ROGERS: Surveillance. On line
11 surveillances.

12 CHAIRMAN ZECH: Well, let me just say, from
13 my standpoint, I believe we need a maintenance rule,
14 but we need a good one. We need the time to make a
15 good one. But I'm convinced that we need one. But
16 I'm not trying to get a maintenance rule in place
17 between now and the next two months while I'm here. I
18 think it's very important that we have a good
19 maintenance rule, but I do feel we need the time to
20 make it right.

21 We need, I think, as perhaps Doctor Lewis
22 pointed out, what rule it is. I agree with that. A
23 good rule is very difficult to make a maintenance
24 rule. Yes, it does have management connotations. I
25 agree with Doctor Siess also when he says quality

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1 assurance because it does have a lot of the same kind
2 of thinking that goes into quality assurance. There's
3 judgment in that.

4 So, professional judgment is a big part of
5 it. We need a good maintenance rule. I remember when
6 I first started looking at the plants. One of my
7 first comments on the Commission to the chairman was
8 at that time that it seems to me we ought to hear from
9 the industry on their maintenance program, and they
10 did. They came and made a presentation to the
11 Commission. The essence of their presentation was
12 that, "Maintenance is excellent. You regulators ought
13 to stay out of it. We know what we're doing in the
14 industry and maintenance is in very good shape."

15 I listened carefully to that. I didn't seem
16 to have much support at the time for any interest in
17 maintenance, but I thought about it a lot. I kept
18 looking at the plants and wondering about it. But I
19 was not impressed. Yes, I think industry was at that
20 time even starting to focus on maintenance and I give
21 INPO a great deal of credit for the efforts they've
22 made in that regard. But it's taken a long time for
23 the industry, in my judgment, to focus on maintenance.

24 I was disappointed in that first
25 presentation. I will say that I think maintenance is

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1 improved. I've seen it improve. I've heard about it
2 improve from you and from our staff and from the
3 industry. I've seen it myself. It has improved. But
4 I still think it has a ways to go. I don't think it's
5 as good as it ought to be.

6 I think there are good maintenance programs
7 out there. I think in some cases there are excellent
8 maintenance programs out there. But I think there are
9 too many plants that don't have a maintenance program
10 that would meet the standard that I would want if I
11 were a utility executive. I can't say they don't meet
12 our regulations at the moment or we'd take some severe
13 action to counter that. But it seems to me that
14 maintenance plays a very important role in safety.
15 Safety is our business. I think we have a right to
16 insure that -- an obligation to insure that
17 maintenance has improved.

18 I think our staff has done an excellent job
19 in trying to come up with a maintenance rule with very
20 little support or help from the industry. It's been a
21 big disappointment to me. I really do believe that if
22 the industry had helped us and the utilities had
23 helped us, we'd have a better maintenance rule than
24 the proposed rule we have.

25 Yes, you can ask questions like, "Did you do

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1 what we told you to do in maintenance and is that
2 satisfactory?" That's one approach, of course. You
3 can also say, "How are they performing out there? Is
4 it safe? If maintenance contributing to safety or
5 not?"

6 There are many things that could have
7 happened that have not happened in my judgment in
8 helping us come up with a maintenance rule. So, I'm
9 not completely satisfied we have a maintenance rule
10 that is good enough. I hope in due time we would have
11 one though and I'd hope that the industry would help
12 us more than they have.

13 Just a couple more points on my views on
14 maintenance. The plants out there now that are
15 conducting good maintenance programs in my judgment
16 doesn't mean they're always going to have good
17 maintenance programs. We've seen plants change.
18 We've seen plants go from operating very well to
19 declining. We've seen it go the other way. We need a
20 standard, it seems to me, for maintenance as well as
21 we do for operations. If maintenance contributes as
22 much to safety as I believe it does, sometimes as much
23 or sometimes more than operations, then I think we
24 need some kind of a standard.

25 I think the proposed rule is probably too

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1 broad. I think I agree with the ACRS comment in that
2 regard and that's one reason I think it should be a
3 better rule and a stronger rule.

4 Yes, we do not have here on the NRC all the
5 expertise in the world on maintenance. That's a fair
6 comment. But we asked for help and we didn't get it
7 and that's disappointing. We may have to get
8 consultants to help us. I would hope we would do that
9 in the future if the industry doesn't help anymore
10 than they have.

11 I think maintenance is improving. No
12 question about it. But I think it needs to improve
13 more. Maintenance does, yes, testing contributes. So
14 does surveillance. Mistakes are made. Maintenance
15 needs to be upgraded, in my judgment. It could be
16 perhaps the most significant operational safety
17 improvement that can be made. We have improved
18 operators. We have improved training significantly.
19 We need to do the same in maintenance, in my judgment.

20 When you talk about management and
21 maintenance and how they interface as far as
22 regulatory responsibility is concerned, I agree. But
23 I think management needs to get more involved in
24 maintenance. Those who are involved in it, in my
25 judgment, are running our better plants. Those who

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1 are not giving the attention to maintenance are not,
2 in my judgment, carrying out their proper
3 responsibilities.

4 I would prefer to see the industry do it all
5 for themselves, but we've been waiting a long time for
6 that. It seems to me that a standard would be helpful
7 to the industry. I am convinced that at least two-
8 third or maybe more of our plants, if we had a
9 maintenance rule, would already be meeting whatever
10 maintenance rule we might have out there. It wouldn't
11 be any real problem to them. But it would help those
12 plants that are not perhaps running as good a
13 maintenance program as they should.

14 It might even help them when they go their
15 PUCs and help the CEO, the chief executive officer,
16 make his case for maintenance funds that he needs if
17 he is not getting perhaps the funds he thinks he
18 needs. I think some of our CEOs are experts at that
19 and can defend themselves extremely well. But perhaps
20 there are some who would be strengthened by a rule.

21 In any case, I hope we do move towards a
22 rule. I think we need one, but I don't think, in my
23 judgment, that we're ready at this time for one. I
24 would hope though that the ACRS would continue
25 thinking about this. If my colleagues would agree

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1 with my thinking on this, we will, at least for the
2 time being, have a strong policy statement and
3 continue to develop -- have a rule in place, but
4 continue to perhaps strengthen it and modify it. I
5 would hope that the ACRS as well as the industry would
6 at least help us try to improve the maintenance in
7 nuclear power plants in our country.

8 Those are my thoughts. If anyone wants to
9 comment, I'd appreciate hearing it. If not, we'll
10 move on to the next subject.

11 DOCTOR REMICK: If not, the fourth subject
12 that you mentioned was NUREG-1150, the severe accident
13 risk assessment for five U.S. nuclear power plants.
14 I'm not sure how much advice we can provide you today
15 on that. It's our understanding that the Commission
16 wishes ACRS to provide views on whether the revised
17 version of NUREG-1150 is suitable for use during the
18 time that a peer review takes place. And in
19 particular, could it be used as part of the IPE
20 process.

21 We only recently received the revised
22 version. We have not had sufficient time to hold a
23 subcommittee. Usually something of this depth we hold
24 a subcommittee meeting first. But we have scheduled
25 two hours of discussion of the full Committee tomorrow

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1 to take up this topic. We're hoping that perhaps
2 after that two hours and then with other thought, that
3 perhaps we can provide you some views on interim use
4 in this meeting, but we cannot guarantee it.

5 CHAIRMAN ZECH: Why don't we plan on doing
6 that now and then we look forward to hearing your
7 views on that. We would appreciate them very much.
8 That's the key question we're asking you to address.

9 DOCTOR REMICK: All right.

10 CHAIRMAN ZECH: So, if you're going to
11 address that tomorrow, we'd appreciate hearing from
12 you when you can on that matter.

13 DOCTOR REMICK: All right. Fine.

14 CHAIRMAN ZECH: Then we ask you to address
15 one last matter too, I think, the integrated --

16 DOCTOR REMICK: Oh, yes. You're right.

17 CHAIRMAN ZECH: -- approach.

18 DOCTOR REMICK: Yes.

19 CHAIRMAN ZECH: Please go ahead.

20 COMMISSIONER ROGERS: Would you care to
21 comment on your opinions of the peer review process
22 that 1150 is being subject to?

23 DOCTOR REMICK: I look to our Chairman of
24 our Subcommittee if he has any comments. I cannot add
25 any at this time.

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1 DOCTOR LEWIS: I don't have any comment.
2 It's a fine list of people. I don't know whether
3 they've all agreed to serve, but I think it's
4 delightful that we're having a peer review, I think.
5 I don't think that the report has been improved as
6 much as the staff does, but I also defer to the peer
7 review.

8 CHAIRMAN ZECH: Well, the Commission also
9 looks forward to the peer review group and I'm sure
10 they will make a contribution to 1150.

11 DOCTOR LEWIS: No, our position was simply
12 that it shouldn't be used until that is done.

13 CHAIRMAN ZECH: Right.

14 DOCTOR REMICK: I'll address myself to the
15 fourth item, the integrated approach to regulatory
16 matters.

17 CHAIRMAN ZECH: Yes. Thank you.

18 DOCTOR REMICK: The letter we wrote on April
19 17th, a fairly short letter. I'd like to say that
20 we're aware that the Commission has worked hard to get
21 a hold on where this Agency is headed and to establish
22 priorities in order to bring some semblance of order
23 in the aftermath of TMI-2.

24 However, we still see many cases of items
25 which seem to crop up and which, regardless of their

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1 risk significance, sometimes get pushed to the
2 forefront of Agency priorities. We feel that this
3 places considerable burden on the licensees. What
4 ongoing activity do they drop to undertake the latest
5 regulation? What is the relative priority of that
6 matter compared to others?

7 We think that from the licensee's
8 perspective, and certainly at times from our
9 perspective, it appears that the Commission's efforts
10 to establish regulatory stability are not working
11 completely. As your safety advisors, we felt
12 compelled to express those views to you, so we sent
13 that brief letter to you indicating that we have some
14 concerns about things. It just seems like this office
15 pops up this issue and this office pops up that issue
16 and we're not sure that anybody's weighing the
17 relative risk priorities of those various things and
18 so that there's some semblance of order of what goes
19 out of the Agency.

20 So that's the general background. I look to
21 my fellow members to see if they want to add anything
22 to that.

23 Hal?

24 DOCTOR LEWIS: No, I think you've said it
25 very well. This isn't a criticism of the Commission,

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1 it's simply an expression of a state of affairs which
2 is not uncommon among agencies, in which each element
3 of the agency does what it honestly thinks is best.
4 Yet it somehow doesn't add up to the best for the
5 whole society. We've seen so many cases of it and we
6 don't want to belabor each one. You've seen it too.
7 We think -- there's something wrong. Cures are
8 another matter.

9 CHAIRMAN ZECH: Right. Well, has the staff
10 discussed their approach to the integrated programs
11 with the ACRS? Have you heard --

12 DOCTOR KERR: The staff gave a presentation
13 on the SECY paper.

14 CHAIRMAN ZECH: Yes.

15 DOCTOR KERR: I would characterize the paper
16 as a very good description of those programs that
17 needed to be integrated. I have not seen anything
18 that tells how they're going to be integrated.

19 CHAIRMAN ZECH: Well --

20 DOCTOR SIESS: Just the opposite.

21 CHAIRMAN ZECH: Yes, I think --

22 DOCTOR SIESS: Mark I containment was
23 deintegrated.

24 COMMISSIONER ROGERS: Say that again,
25 please?

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1 DOCTOR SIESS: Mark I containments was
2 deintegrated.

3 COMMISSIONER ROBERTS: Well, I wouldn't
4 presume to put words in your mouth, but in your letter
5 you specifically mention the maintenance rule. Would
6 you put charging off with the Mark I so-called
7 improvements and simultaneously doing the IPE program
8 an example of what you refer to in this letter?

9 DOCTOR REMICK: Yes.

10 COMMISSIONER ROBERTS: Thank you. So would
11 I.

12 MR. WARD: IN fact, we wrote a letter
13 specifically on that.

14 COMMISSIONER ROBERTS: Thank you.

15 CHAIRMAN ZECH: Well, let me just make a
16 comment and then I'll ask for other comments from my
17 colleagues.

18 I certainly agree that integrating our many
19 different programs is extremely important. I've
20 mentioned this to the staff before and asked them to
21 take on this project to make sure that we start with a
22 safety goal perhaps and integrate the severe accident
23 policies, the Mark I containment, all the other very
24 important issues that bear on plant safety and that we
25 do integrate, that we make sure we have a thread of

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1 consistency flowing through them. I think
2 conceptually, that's what we'd all like, we'd all want
3 to have.

4 Again, it's true that parts of the staff,
5 I'm sure well meaning, are going after their own
6 particular program and doing it very professionally
7 and that's not a criticism of them either. But it is
8 important that at a higher level somewhere that we do
9 integrate these programs. It's the same view I had
10 when I first started thinking about the necessity of a
11 back-fit rule.

12 I think perhaps after Three Mile Island, the
13 Commission, the staff, all of us or all of those who
14 were here, well meaning and taking issue after issue
15 and addressing it and issuing regulations and so
16 forth, probably every one by itself can be justified.
17 But integrating those things over a whole -- and
18 making them consistent, bring them together, seems to
19 me very necessary. That's why I thought some kind of
20 discipline to our system, such as the back-fit rule,
21 was important, so that we look carefully and with some
22 kind of an analytical process before we go ahead and
23 make some regulation that by itself may improve safety
24 in this area but may detract perhaps in this area.

25 So, I think an integrated approach to all

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1 our regulatory matters is extremely important. It is
2 a big issue. I appreciate your letter. I appreciate
3 your views on it. I think they're very consistent
4 with the Commission's views.

5 On the other hand, what we've asked the
6 staff to come up with is a pretty tough problem, I
7 suppose. But I do think it's worth a fair amount of
8 thought. It's worth the Commission involvement, I
9 think, in attempting to get integrated programs
10 because they simply must contribute one to the other
11 and they must be brought together at some level.

12 So, I would hope that perhaps -- the staff,
13 I know, is trying to do this and it may be an
14 impossible task we've given them. We'll have to think
15 about that. But I do feel that if the ACRS, in your
16 good judgment and your experience, can assist us in
17 some way and perhaps assist the staff in taking a more
18 detached view than maybe they're able to take, it
19 might be very helpful to the Commission.

20 So, my approach would be to ask the staff to
21 look at your letter and to see what they can come back
22 to us with. On the other hand, I think if the ACRS
23 could, in due time, because I think this is another
24 difficult issue to wrestle with and we wouldn't expect
25 you to try to help us solve it overnight, but if you

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1 could take this on and see if there's some way from
2 your different viewpoint that you might be able to
3 help us with looking at an integrated approach, even
4 from a systematic or a philosophical approach, might
5 be a good starting point, because I do think the
6 effort to integrate these programs is very important.

7 Commissioner Roberts has a good point
8 because -- and I think we all look at it the same way.
9 We recognize these various programs that we're
10 addressing. We don't want to address them in
11 isolation. There is a tendency, I think, to do that
12 because you look at the logic and the good sense to
13 the program and such. But how does it integrate with
14 other programs? I think it's important. Perhaps the
15 ACRS can help us in that regard. I, for one, would
16 ask you to take on that issue.

17 DOCTOR REMICK: There's several of us on the
18 Committee, of course, that work for licensees to the
19 NRC and have to read issuances from the Commission.
20 Some of us have to face students and talk to them
21 about the NRC and the regulations and so forth. It's
22 surprising trying to explain sometime the thread of
23 continuity and consistency that exists in the
24 regulations and what is going on.

25 CHAIRMAN ZECH: That's a very important

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1 undertaking. It really is. It's a very, very big
2 issue as far as I'm concerned. I think you recognize
3 that as well as we recognize it. It's a very
4 important issue. But if you could take that on one
5 and think about it some more, I think it would be very
6 helpful to the Commission.

7 Commissioner Roberts?

8 DOCTOR LEWIS: I wonder if I --

9 CHAIRMAN ZECH: Yes, please, go ahead.

10 DOCTOR LEWIS: I just wanted to jump in
11 where I'm not wanted. Coordination in an agency, you
12 know, you wouldn't run a ship by committee. If the
13 chips are down, somebody has to --

14 CHAIRMAN ZECH: Yes, you can say that again.

15 COMMISSIONER ROBERTS: You wouldn't run this
16 agency with a commission, would you?

17 CHAIRMAN ZECH: One of the reasons I favored
18 a single administrator as I'm sure you know.

19 DOCTOR LEWIS: And besides, I've also been
20 on a ship. But anyway, you wouldn't. You just can't
21 do it. In that sense, the trouble of coordination of
22 an integrated approach, you can't go a step below the
23 Committee that runs this Agency, which is you folks.
24 It's a little complicated. You can't go from there
25 down the line to get an integrated policy.

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1 CHAIRMAN ZECH: Yes. Yes.

2 DOCTOR LEWIS: In fact, in most
3 organizations, the integrated policy comes from the
4 chief executive officer.

5 CHAIRMAN ZECH: Okay.

6 DOCTOR LEWIS: You know, you hire him and
7 fire him according to whether he can accomplish that.
8 Still less can you get an integrated policy from the
9 advisory committee to the committee that runs the
10 agency.

11 CHAIRMAN ZECH: Well, I don't know if I
12 agree with that. I agree that giving it to the staff
13 is very difficult. On the other hand, I think it's
14 fair to let them hear their views on it because,
15 you're right, we have to make the decision. No
16 question about it. But it's helpful to have their
17 views, I think.

18 DOCTOR LEWIS: Oh, yes.

19 CHAIRMAN ZECH: And also, by the same token,
20 I think that the ACRS, we have to make the decision.
21 It's our responsibility and we will make it. You can
22 count on that, I'm sure. But we want to make the best
23 decision we can. I really do believe that you and
24 your collective experience can at least give your
25 thoughts to us and we will make the decision and we'll

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1 take the responsibility for making it.

2 But I think in our arriving at that
3 important decision to integrate the programs, it's a
4 little bit in a sense like the safety goal and trying
5 to implement the safety goal. I think you have
6 something to offer.

7 DOCTOR LEWIS: Yes. It's just that in this
8 subject there is no enemy. There's nobody against
9 integration.

10 CHAIRMAN ZECH: No. Exactly.

11 DOCTOR LEWIS: That's what makes it so much
12 harder.

13 CHAIRMAN ZECH: I agree. I agree exactly.

14 DOCTOR REMICK: We are in a somewhat unique
15 position. Other than the Commission, ACRS and a
16 couple of your senior staff members, many other people
17 don't see what is going on --

18 CHAIRMAN ZECH: Exactly.

19 DOCTOR REMICK: -- the breadth of the
20 Agency. We see that breadth, not as much as you do--

21 CHAIRMAN ZECH: But you do see that.

22 DOCTOR REMICK: -- so we are able to
23 compare.

24 CHAIRMAN ZECH: Yes.

25 DOCTOR REMICK: Sometimes when we work with

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1 staff from one office, they're not at all where a
2 related program in another office.

3 CHAIRMAN ZECH: Certainly.

4 DOCTOR REMICK: We see this type of thing.
5 We are in a position sometimes where we --

6 CHAIRMAN ZECH: Yes, I think you can make
7 a -- you can help us. We have to make the decision, I
8 agree.

9 Commissioner Roberts?

10 COMMISSIONER ROBERTS: Are we completing the
11 meeting? Have we finished the last topic?

12 CHAIRMAN ZECH: This is the last topic and
13 we're asking colleagues questions on the last topic.

14 COMMISSIONER ROBERTS: I have no questions
15 on that, but --

16 CHAIRMAN ZECH: We'll come back to you then.

17 COMMISSIONER ROBERTS: All right. Thank
18 you.

19 CHAIRMAN ZECH: Commissioner Rogers?

20 COMMISSIONER ROGERS: Well, just that I
21 wanted to say that you do have that vantage point
22 that's rather unique and I think you are in a special
23 position to be able to see where things seem to be
24 disconnected and not properly integrated.

25 I'd also ask you to think, if you could,

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1 about perhaps where there might be some problems due
2 to a lack of knowledge, that the things aren't being
3 integrated because there is some question someplace
4 that someone feels they need an answer to that they
5 don't have that sets an improper priority on the work
6 in some way. I think you would also be in a very
7 special position to be able to point out to us where
8 there are roadblocks to integration because of a lack
9 of knowledge, important knowledge.

10 DOCTOR KERR: I'm sure you are as aware, as
11 those of us who come from academic backgrounds, of the
12 compartmentalization that takes place within
13 universities. I think things are equally
14 compartmentalized in this organization, for good or
15 ill.

16 CHAIRMAN ZECH: Commissioner Curtiss?

17 COMMISSIONER CURTISS: No comments.

18 CHAIRMAN ZECH: Commissioner Roberts, you
19 had a comment to make?

20 COMMISSIONER ROBERTS: Well, I don't want to
21 get into an argument over semantics with my colleague,
22 Commissioner Rogers. But I'll just tell you from my
23 point of view, it is certainly -- back to our earlier
24 discussion about management and regulation. Certainly
25 the imposition of regulations can affect management,

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1 but in my view they are clearly separable and when
2 they do tend to get fuzzy, we have a compelling
3 obligation to make them as separable as possible
4 because I think regulation and management are two
5 different entities.

6 That's all I have to say.

7 CHAIRMAN ZECH: All right. Thank you.

8 COMMISSIONER ROGERS: I won't rise to that
9 bait.

10 CHAIRMAN ZECH: All right. Fine.

11 Well, let me thank the ACRS again for
12 another very fine presentation. When will you come
13 back to the Commission again? Do we have another
14 meeting scheduled?

15 DOCTOR REMICK: No, none scheduled at the
16 moment.

17 CHAIRMAN ZECH: Well, it may not get back
18 before I leave. If that does take place and you don't
19 appear before us again, I would like to take this
20 opportunity, Doctor Catton, to welcome you again --

21 DOCTOR CATTON: Thank you.

22 CHAIRMAN ZECH: -- to the Committee and I
23 would also like to welcome the other new member who
24 hasn't been here too long to the table, Mr. Carroll.
25 It's a pleasure to have you with us.

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1 To all of you who I've gotten to know so
2 much better than the new members perhaps, and to all
3 of you, I would like to offer you my own personal
4 gratitude for your competence, your intellect and your
5 willingness to share your views and your time, your
6 energy with this Commission.

7 I can't tell you how much it means to me to
8 have had the benefit of your views. I think I can
9 speak for all my colleagues in this regard, but
10 certainly speaking for myself, I want you to know how
11 much I appreciate working with you and I'll be
12 eternally grateful for the way that you have assisted
13 me as Chairman in particular and assisted all my
14 colleagues in coming to these important decisions that
15 we have to make.

16 We do make the decisions. We are the
17 Commission. We make the final decisions. We make the
18 best ones we can. We have a lot of good advice from
19 the staff, a very competent dedicated staff who does
20 their best to give us the good advice. But I can
21 assure you that as far as I'm concerned the Advisory
22 Committee on Reactor Safeguards has in the past, over
23 the many years, and continues to make a very real
24 contribution to this Commission. I, for one, wish to
25 thank everyone of you for the time you give and for

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1 your great contribution to our Agency and to our
2 country.

3 DOCTOR REMICK: Mr. Chairman, we wanted also
4 to express our pleasure for the opportunity to work
5 with you during these past five years. You've openly
6 and repeatedly expressed appreciation of our effort
7 and that's made us feel very good, of course. But it
8 also spurred us on to try to do the best possible job
9 that we can in giving advice to the Commission.

10 You've been very receptive and attentive to
11 our letters. We know that. Some of the
12 recommendations you accept, some you reject, but we
13 understand that fully. We just provide advice, you
14 must make the decisions. But we want you to know that
15 we've been extremely proud to have been part of the
16 Agency under your Chairmanship. We wish you very well
17 for the future.

18 CHAIRMAN ZECH: Thank you very much for
19 those kind remarks.

20 Thank you very much, gentlemen. We stand
21 adjourned.

22 (Whereupon, at 3:36 p.m., the hearing was
23 concluded.)

24

25

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: PERIODIC BRIEFING BY ADVISORY COMMITTEE
ON REACTOR SAFEGUARDS

PLACE OF MEETING: ROCKVILLE, MARYLAND

DATE OF MEETING: MAY 3, 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.

Judy Hadley

Reporter's name: PETER LYNCH

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

February 16, 1989

The Honorable Lando W. Zech, Jr.
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Zech:

SUBJECT: FURTHER ACRS COMMENTS ON IMPLEMENTATION OF THE SAFETY GOAL
POLICY

During the 346th meeting of the Advisory Committee on Reactor Safeguards, February 9-11, 1989, and in meetings on October 6-7, December 15-16, 1988, and January 12-14, 1989, we continued our review of the NRC staff's plans for implementing the Safety Goal Policy. We had the benefit of a draft paper for Commission approval, "Implementation of Safety Goal Policy," dated January 17, 1989, and of presentations by a member of the staff. We had previously commented to you on this subject in our letters of May 13, 1987, and April 12, 1988, following a number of exchanges with the NRC staff, including several meetings with our Subcommittee on Safety Philosophy, Technology, and Criteria as well as with the full Committee.

Although we agree with the general direction of the staff's recommendations, we have substantive differences about a number of issues. We urge the Commission to implement the policy after considering our recommendations.

Background

The draft paper proposes guidelines for the NRC staff to use in implementing the Safety Goal Policy. These guidelines include the structure of an implementation plan, definitions, and quantitative objectives. The paper calls for these guidelines to be incorporated into the policy statement itself through an amendment. In addition, the paper proposes that potential averted on-site costs be used as an offset to licensee costs in cost-benefit analyses. And finally, the paper asks the Commission itself to consider whether the policy should be amended to clarify the relationship of the safety goal and the statutory standard of adequate protection.

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Before commenting specifically on the staff paper, an observation about the use of probabilistic risk assessment (PRA) and its relation to the safety goal is appropriate. Although it is frequently said that "the bottom line is the weakest part of PRA," the fact remains that the safety goal cannot be implemented without the bottom line. Without this bottom line and a safety goal to which it can be compared, either explicitly or implicitly, PRA becomes a never-ending search for outliers. Although it is satisfying to some engineers and analysts to identify "dominant" contributors to risk, especially those that can be eliminated readily, there is nothing necessarily less safe about a plant that has most of its risk embodied in one or two outlier sequences than a plant that has its risk distributed more or less uniformly over 20 sequences.

Structure of the Implementation Plan

The draft paper describes a structure similar to that suggested in our letter of May 13, 1987, but with some differences. We continue to prefer the structure we recommended, a hierarchical arrangement of five levels using the multiple goals in the policy statement of August 6, 1986.

The staff's current proposal is consistent with our recommendations for Levels One and Two. Level One is the pair of qualitative goals and Level Two is the two quantitative health objectives.

Our recommendation for Level Three would be the general performance guideline that large accidental releases should occur no more frequently than $1E-6$ per reactor-year. The staff's Level Three proposal is similar, but differs in the definition of "large release."

The staff proposal defines a large release as "a release that has a potential for causing an offsite early fatality." We are still not satisfied with this definition for two reasons. First, it can or could be considered as little more than the quantitative health objective in Level Two, but at a level ten times more conservative. Second, this considerable additional conservatism is not accompanied by a significant simplification. The use of the word "potential" in order to encompass the release at Chernobyl will require the use of Level 3 PRA results with a suitable prescription or selection of potential meteorology and population distribution or location. Although this would be possible for specific plants, it would require arbitrary assumptions if the safety goals are to be used to test the sufficiency of the Commission's regulations or to provide a basis for establishing design criteria for containments for future plants.

We continue to believe that a definition in terms of the release itself is preferable. It might be defined in terms of curies, leak

February 16, 1989

or release rate, or fraction of the core or containment inventory. In any case, it should be independent of the site characteristics and should provide some criteria against which the design or performance of containments can be tested. We urge you to request the staff to continue seeking a means to define a large release that is not significantly more conservative than the Level Two health objectives and that focuses the mitigative function on containment design characteristics independent of site or population characteristics.

Our recommendations for Level Four consisted of three specific performance objectives: (1) core melt probability, an expression of the effectiveness of a plant's prevention systems, (2) conditional probability of containment failure, an expression of the effectiveness of a plant's mitigation systems, and (3) an expression of how well a plant is operated. (We use here the term "prevention" to describe those activities and systems intended to keep the reactor core from melting, and "mitigation" to describe those activities and systems intended to keep away from the public fission products that would be released from a melted core.) Level Four proposed by the staff is significantly different from what we recommended. It would consist of only one of the three objectives we recommended, a limit on core damage frequency. This loses the balance between prevention and mitigation, one form of defense-in-depth, that is inherent in our inclusion of a containment performance objective. We believe this balance should be retained.

The staff proposal for Level Four also omits the ACRS recommendation for a quantification or objective statement of how well a plant is operated. We called this a "plant performance objective." We have not been able to develop a workable definition for this, nor has the staff. In light of this, we rely upon the alternative recommendation made in our letter of April 12, 1988: "If this cannot be done, a prominent caveat, e.g., a warning that PRA results do not tell the full story, should be made a part of the policy or of the implementation plan." We recommend that such a statement be made an explicit part of the plan.

In our letter of May 13, 1987, we recommended a quantitative objective of $1E-4$ per reactor-year for "core melt" as a part of the Level Four performance objectives. In our letter of April 12, 1988, we more carefully defined the event that should be associated with this quantitative objective as the "loss of adequate core cooling (core overheating beyond design-basis limits)." The staff proposal seems to agree with our recommendation. We caution, however, that comparisons of this objective with some of those proposed by others under the description of core melt probability can be misleading.

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We disagree with the staff's proposal to use $1E-5$ per reactor-year as the target for mean core damage frequency for future plants. This difference from the objective for existing plants introduces an arbitrary level of conservatism which conflicts with the criterion we suggested for linking the hierarchical levels of safety goal objectives; that is, that each subordinate level of the hierarchy should be consistent with the level above and should not be so conservative as to create a de facto new policy. Not only would the staff proposal introduce a major inconsistency with the Level Two and Three objectives, but it would result in loss of balance between prevention and mitigation because arguments could then be made that the higher levels of the safety goal hierarchy could be met readily without the need for accident mitigation systems such as containment buildings. The Commission's safety goal should be the same whether considering the adequacy of regulations for existing plants or for future designs, and whether for LWRs or other types of reactor plants.

Definition of "Adequate Protection"

The term "adequate protection" has importance in the legal areas of safety regulation. Although it is needed and used with apparent precision in legal instruments, its technical definition is not precise. In general, it is accepted as equivalent to the term "with no undue risk to public health and safety" often used in other contexts. Another term, "in full compliance with the regulations" is used as a surrogate, on occasion, for either of these.

We believe that the safety goal should play an important, but indirect, role in defining adequate protection. Ideally, compliance with the Commission's regulations is a suitable surrogate for defining adequate protection of the public. However, we believe that the adequacy of the regulations should be judged from the viewpoint of whether nuclear power plants, as a class, licensed under those regulations, meet the safety goals. It is our understanding, following discussions with the staff, that the staff proposes the safety goal to be a sort of aspirational objective which would be sought but not necessarily reached.

With the safety goal approach now proposed by the staff, a class of plants that meets existing regulations (therefore meeting a standard of adequate protection) would be obliged to make improvements up to the safety goal, if cost-benefit arguments so dictated. The implementation plan proposed earlier by the staff would have used the safety goal as the minimum standard (i.e., adequate protection) and cost-benefit arguments could have been used to justify further

February 16, 1989

improvements, without other limits. We believe that neither of these approaches is a proper use of the Safety Goal Policy.

We believe that the proper use of the safety goals is embodied in two principles which we have previously recommended:

- (1) The safety goal is a definition of how safe is safe enough.
- (2) At the present time, the safety goal should be applied to judging the adequacy of regulations and regulatory practices, and not to make specific decisions about individual plants.

The Commission has taken a bold and progressive step in proclaiming the Safety Goal Policy. It is an attempt to place the regulation of safety in nuclear power plants in an appropriate context relative to other risks in society. It is imperfect, but it is as useful a step as has been taken by any industry or regulatory agency. Using concepts of cost-benefit analysis or, even worse, ALARA (as low as reasonably achievable), dilutes the achievement and effectiveness of the Safety Goal Policy. We believe that the safety goal is a good present standard for "how safe is safe enough." Further, as we have stated earlier, we believe that the safety goals should be used to judge the adequacy of the regulations from the standpoint of whether those regulations result in classes of nuclear power plants which can be and are operated in such a way as to meet the safety goals, and thus provide adequate protection to the public.

A wide community of safety experts and policy makers has concurred, after extended deliberation, in accepting the Safety Goal Policy as reasonable, based on present knowledge. It may be that future information about reactor risk or societal risk will cause a need to adjust the safety goal one way or another, or to make different implicit allowance for uncertainty. Until that happens, we believe that the safety goal should be accepted as an unambiguous working standard for the regulation of nuclear power, along the lines we have suggested.

Cost-Benefit Analysis

The staff paper proposes that cost-benefit analyses made to evaluate proposed plant safety improvements should use averted on-site costs as an offset to the plant costs entailed in making such improvements. We believe that this is appropriate in making cost-benefit assessments, although it inevitably adds uncertainty to the results. However, as discussed above and as we stated in our letter of April

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12, 1988, we believe cost-benefit analysis is not properly a part of safety goal implementation (in contrast to "backfit" implementation).

Incorporation of Guidelines Into the Policy

We concur with the staff proposal to incorporate certain of the implementation guidelines as amendments to the policy statement. We have no preferences or comments about the details of this, beyond the reminder that the safety goal is a policy statement, not a regulation.

Coherence Among Regulatory Policies

The Safety Goal Policy has been in existence for some time and has, in fact, been an influence in recent regulatory activities. We believe a clear implementation plan is necessary to ensure that it is applied comprehensively, consistently and unambiguously. Several major Commission decisions are presently on the horizon regarding, for example, the Severe Accident Policy, the issue of Mark I containment adequacy, certification of advanced reactor designs, and evaluation of plant operations. In each of these, the question "how safe is safe enough" must be answered, either implicitly or explicitly. The safety goal can and should bring greater objectivity, consistency and clarity to deliberations and decisions about these issues.

Sincerely,

A handwritten signature in dark ink, appearing to read "Forrest J. Remick", written in a cursive style.

Forrest J. Remick
Chairman

Reference

Draft Proposed Paper from V. Stello, Jr., Executive Director for Operations, to the Commissioners, Subject: Implementation of Safety Goal Policy (Predecisional) (received January 17, 1989).



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

April 11, 1989

The Honorable Lando W. Zech, Jr.
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Zech:

SUBJECT: PROPOSED FINAL RULEMAKING RELATED TO MAINTENANCE OF NUCLEAR
POWER PLANTS

During the 348th meeting of the Advisory Committee on Reactor Safeguards, April 6-8, 1989, we discussed the draft Commission paper related to final rulemaking for maintenance of nuclear power plants, including a draft regulatory guide. Our Subcommittee on Maintenance Practices and Procedures discussed this matter with representatives of the NRC staff and the Nuclear Management and Resources Council during a meeting held on March 30, 1989. We also had the benefit of the document referenced. We previously commented on the proposed rulemaking in a report dated September 13, 1988.

In our September 13, 1988 report we did not endorse the staff's proposal to establish a maintenance rule. After review of the proposed final rule, including the public comments and a related draft regulatory guide, our position remains essentially the same. We still believe that good maintenance is a necessary ingredient in any operational program that seeks to ensure reliable and safe plant operation, but that is not the issue. The issue is how to achieve good maintenance.

We were told by the industry that its aggressive emphasis on the development of effective maintenance programs over the past several years has resulted in a marked improvement in the maintenance programs themselves, and in significant progress toward reaching its objectives. The staff members with whom we conferred agreed that this is the case. Further, we were told that a staff evaluation of a sample of maintenance programs, which included about one quarter of those plants now operating, indicated that only a few percent of the operating plants may have poor maintenance programs. Given an environment in which there is already a scarcity of industry and NRC resources, we believe that it is more cost effective to seek improvements applicable to the few plants with "poor" maintenance programs by means of existing regulations rather than burdening all plants with a costly program of unproven efficacy.

The scope of the proposed final rule is also of concern. The Commission has the responsibility to regulate the operation of nuclear power plants in a way that ensures protection of the public health and safety, but

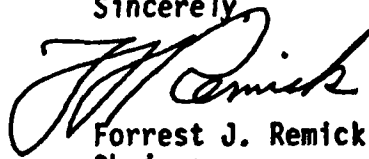
April 11, 1989

does not have the responsibility for managing plant operation. The proposed final maintenance rule strains severely and may violate the boundary between regulating and managing. The scope of the proposed final rule and its accompanying regulatory guide is so broad that almost every facet of plant operation would be under the continuing scrutiny of the NRC on the basis of its effect on maintenance. This would be counterproductive.

Because everyone involved believes that maintenance programs are improving, and because the industry is committed to additional improvements, we recommend that the staff continue to monitor the industry's progress and not intervene at this time.

The proposed final rule would introduce a major policy change extending NRC responsibility far beyond identified safety systems. We do not believe such a significant change in policy should occur in the guise of a maintenance rule which deals only with maintenance and provides no guidance on which systems deserve special attention. The ACRS has in the past recommended more emphasis on the performance of some nonsafety systems. For example, the Committee recommended an evaluation of the contributions to risk from failures of nonsafety-grade control systems. More recently, the Committee has recommended a reevaluation of the current set of regulations in the light of additional insights provided by risk-based evaluations of plant performance and the adoption of safety goals. We would endorse a well-conceived reevaluation of current regulations which would undoubtedly suggest that more regulatory emphasis should be placed on some systems that in the past have been treated as balance-of-plant, and less on others. However, this evaluation should be done in an integrated manner which would, on the basis of what has been learned about risk contributions, identify some systems for special attention.

Sincerely,



Forrest J. Remick
Chairman

Reference:

Memorandum dated April 6, 1989 from Bill M. Morris, Office of Nuclear Regulatory Research, for Raymond F. Fraley, ACRS, Subject: Draft Commission Paper for Notice of Final Rulemaking For Maintenance of Nuclear Power Plants," w/enclosures (Predecisional)



UNITED STATES
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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

January 23, 1989

The Honorable Lando W. Zech, Jr.
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Zech:

SUBJECT: NUREG-1150: RESOLUTION OF ACRS COMMENTS

We have noticed in SECY 88-337, a memorandum from the Executive Director for Operations (EDO) to the Commission, a misleading reference to the ACRS which we want to correct.

You will recall that we reviewed the draft version of NUREG-1150, "Reactor Risk Reference Document," and sent you comments in a letter dated July 15, 1987. More recently, in a letter of July 20, 1988, which reported on SECY 88-147, we commented further:

"In our discussions with the staff, we explored how the Reactor Risk Reference Document (NUREG-1150) will be used in the resolution of the severe accident issues. Although we were told that the information in this document will play a key role, we were unable to get a clear picture of just how. If NUREG-1150 is to play a key role, it is important that its accuracy and credibility be established. We believe that subjecting the final version of NUREG-1150 to a thorough peer review is required as part of the process of establishing credibility."

As the EDO reports in SECY 88-337, we did meet with him and with members of his staff on August 11, 1988. Much of our discussion had to do with what we see as a need for peer review of the final version of NUREG-1150 (renamed Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants). It is true that the staff's proposed uses of NUREG-1150 were presented to us. However, we declined to comment on the specific uses proposed for NUREG-1150 and instead recommended correction of the identified deficiencies and a peer review of the final version to establish its accuracy and credibility before publication in final form.

Following our meeting with the EDO, we wrote to you in a letter dated August 16, 1988:

January 23, 1989

"Reviews by a number of individuals and groups were highly critical of the original draft of NUREG-1150. In view of the extensive modifications that have been made in response to this criticism, the current version must be regarded as a new document. Also, since this document is intended to play a substantial role in the implementation of the Commission's severe accident policy, its quality and credibility are very important.

We recommend that before publication in final form, the final version of NUREG-1150 be subjected to a thorough peer review."

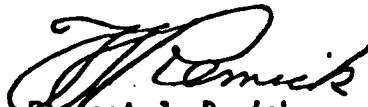
However, in SECY 88-337, the EDO proposes to publish a revised version of NUREG-1150 without peer review (and to publish the report of a peer review to be performed later as a supplement). Further, a statement is made in referring to the staff's proposed uses of NUREG-1150:

"These uses were discussed with the ACRS, which did not indicate any objection to them."

This might lead to the conclusion that we had endorsed the use of the revised version for the purposes listed. We have not. We have not even seen it.

Additional comments by ACRS member Harold W. Lewis are presented below.

Sincerely,


Forrest J. Remick
Chairman

Additional Comments by ACRS Member Harold W. Lewis

I believe the misstatement here is more serious and offensive than does the Committee. We often state that our letters speak for themselves, and ask our own members to avoid interpreting Committee positions. The EDO, in effect, is telling you that we concur in his proposed use of a report we have repeatedly criticized in writing. We have not done so, and it is not only improper for him to tell you we have, it is disingenuous.

January 23, 1989

Our written recommendation was for a peer review before publication. I believe that was a good recommendation, and that the Commission should so insist.

References

1. U.S. Nuclear Regulatory Commission, NUREG-1150, "Reactor Risk Reference Document," Draft for Comment, February 1987
2. SECY 88-147, Memorandum dated May 25, 1988, for the Commissioners from V. Stello, Executive Director for Operations, Subject: Integration Plan for Closure of Severe Accident Issues
3. SECY 88-337, Memorandum dated December 8, 1988, for the Commissioners from V. Stello, Executive Director for Operations, Subject: Plans For Future Review of NUREG-1150



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

August 16, 1988

The Honorable Lando W. Zech, Jr.
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Zech:

SUBJECT: REPORT ON NUREG-1150, "REACTOR RISK REFERENCE DOCUMENT"

During the 340th meeting of the Advisory Committee on Reactor Safeguards, August 11-13, 1988, we discussed the staff's plan for the development of the final version of NUREG-1150, "Reactor Risk Reference Document," with Mr. V. Stello, Jr., Executive Director for Operations, and members of his staff. We also had the benefit of the documents referenced.

In our July 20, 1988 letter to you on the Integration Plan for Closure of Severe Accident Issues, we stated, "We believe that subjecting the final version of NUREG-1150 to a thorough peer review is required as part of the process of establishing credibility."

Reviews by a number of individuals and groups were highly critical of the original draft of NUREG-1150. In view of the extensive modifications that have been made in response to this criticism, the current version must be regarded as a new document. Also, since this document is intended to play a substantial role in the implementation of the Commission's severe accident policy, its quality and credibility are very important.

We recommend that before publication in final form, the final version of NUREG-1150 be subjected to a thorough peer review.

Sincerely,

A handwritten signature in cursive script, appearing to read "W. Kerr", is located below the word "Sincerely,".

W. Kerr
Chairman

August 16, 1988

References:

1. Memorandum dated August 10, 1988 from V. Stello (EDO) to R. Fraley (ACRS), "Plans for Review of Final NUREG-1150"
2. SECY-88-147, Memorandum dated May 25, 1988, for the Commissioners from V. Stello, Executive Director for Operations, Subject: Integration Plan for Closure of Severe Accident Issues
3. Brookhaven National Laboratory Report, NUREG/CR-5000, "Methodology for Uncertainty Estimation in NUREG-1150 (Draft): Conclusions of a Review Panel," H. Kouts et al., December 1987
4. Lawrence Livermore National Laboratory Report, NUREG/CR-5113, "Findings of the Peer Review Panel on the Draft Reactor Risk Reference Document, NUREG-1150," W. Kastenberg et al., May 1988
5. American Nuclear Society, "Initial Report of the Special Committee on Reactor Risk Reference Document (NUREG-1150)," L. LeSage et al., Draft Report dated April 1988



UNITED STATES
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April 17, 1989

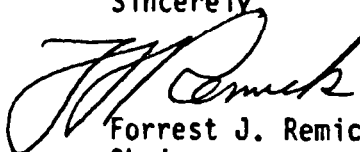
The Honorable Lando W. Zech, Jr.
Chairman
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Chairman Zech:

SUBJECT: INTEGRATED APPROACH ON REGULATORY MATTERS

We are concerned that in a variety of matters, of which the proposed maintenance rule is only the most recent example, isolated subjects have been identified by the NRC as requiring additional regulatory attention, in the absence of any clear overall guidance about integrating priorities. The ACRS has long advocated an integrated approach, based, at least in part, on the safety goal and severe accident policies, but there is little evidence that the recommendations have taken root. The problem is that for each item considered separately it is possible for the staff to come to the conclusion that more regulation is necessary, but the overall effect is one of diluting the industry's and NRC's resources, thereby detracting from the overall quality of the effort. This is a subject that cannot be dealt with without clear guidance from the Commission. We think it important.

Sincerely,


Forrest J. Remick
Chairman



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

March 15, 1989

MEMORANDUM FOR: Chairman Zech
FROM: Forrest J. Remick, Chairman, ACRS
SUBJECT: CONTAINMENT DESIGN CRITERIA

A handwritten signature in dark ink, appearing to read "F. J. Remick", is written over the "FROM" line of the memorandum.

During the 347th meeting of the Advisory Committee on Reactor Safeguards, March 9-11, 1989, we discussed our plan of action to develop containment design criteria for nuclear power plants, based on current knowledge, in response to the referenced Staff Requirements Memorandum.

Containment performance in response to severe accidents is being considered by several groups within the NRC staff for existing nuclear power plants via the NRC Severe Accident Policy Statement as well as criteria for evolutionary light-water reactors. The Committee will concentrate its efforts on containment design criteria for future reactors, taking into account the work already being done by the staff and others.

An initial subcommittee meeting has been tentatively scheduled for April 18, 1989 to consider this matter.

Reference:

Staff Requirements Memorandum dated July 28, 1988 from Samuel J. Chilk, Secretary, for Raymond F. Fraley, ACRS, Subject: Staff Requirements - Periodic Briefing by the ACRS, Thursday, July 14, 1988

cc: Commissioner Roberts
Commissioner Carr
Commissioner Rogers
Commissioner Curtiss
OGC
EDO
GPA