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UNITED STATES NUCLEAR REGULATORY COMMISSION'S

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

JANUARY 11, 1999

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1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

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4 BRIEFING ON RISK-INFORMED INITIATIVES

5 ***

6 PUBLIC MEETING

7 ***

8 Nuclear Regulatory Commission

9 Commission Hearing Room

10 11555 Rockville Pike

11 Rockville, Maryland

12 Monday, January 11, 1999

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14 The Commission met in open session, pursuant to

15 notice, at 2:05 p.m., Shirley A. Jackson, Chairman,

16 presiding.

17 COMMISSIONERS PRESENT:

18 SHIRLEY A. JACKSON, Chairman of the Commission

19 GRETA J. DICUS, Commissioner

20 EDWARD McGAFFIGAN, JR., Commissioner

21 JEFFREY S. MERRIFIELD, Commissioner

22 STAFF PRESENT:

23 ANNETTE L. VIETTI-COOK, Secretary

24 of the Commission

25 KAREN D. CYR, General Counsel

1 PRESENTERS:

2 SAMUEL COLLINS, NRR

3 WILLIAM TRAVERS, EDO

4 GARY HOLAHAN, NRR

5 ASHOK THADANI, RES

6 THOMAS KING, RES

7 TONY PIETRANGELO, NEI

8 RALPH BEEDLE, Nuclear Generation

9 STEVE FLOYD, NEI

10 DAVID LOCHBAUM, UCS

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

2 [2:05 p.m.]

3 CHAIRMAN JACKSON: Good afternoon, everyone. I'm
4 pleased to welcome members of the NRC staff, the Nuclear
5 Energy Institute, and the Union of Concerned Scientists here
6 today to brief the Commission on the status of recent
7 risk-informed initiatives, recent accomplishments in this
8 area, and any areas where difficulties, challenges, or
9 limitations have arisen affecting our ability to incorporate
10 risk-informed approaches to our regulatory processing.
11 In August 1995 the Commission issued the
12 probabilistic risk assessment policy statement, formalizing
13 its commitment to risk-informed regulation. More recently,
14 the staff has developed a paper on risk-informed
15 performance-based regulation that defines what is meant by
16 these terms and how these concepts fit into the regulatory
17 process. This paper will be available in its final form
18 shortly.
19 Over the last two to three years the staff also
20 have developed guidance, including standard review plan
21 sections and regulatory guides on the use of risk
22 information, and the staff currently -- hello -- is
23 processing license amendment applications that use risk
24 assessments as part of their technical justifications. Over
25 the past several months significant progress on

1 risk-informed initiatives has been made in many focused
2 areas such as technical specifications, in-service
3 inspection, in-service testing, and quality assurance.
4 At the same time -- we don't have the sound,
5 excuse me. Can you hear me? Okay.
6 At the same time the NRC has received feedback
7 from the nuclear power industry and other stakeholders that
8 some of the risk-informed initiatives may not have the
9 desired effect and that issues remain to be resolved in the
10 definition of terms.
11 Today the staff is prepared -- I think you're
12 prepared -- to discuss options for incorporating
13 risk-informed approaches into a much broader range and band
14 of the Commission's regulations governing power reactors.
15 In its September 2, 1998 briefing to the Commission on the
16 status of the PRA implementation plan, the staff proposed
17 the development of various options for risk-informing
18 requirements in 10 CFR Part 50. The staff has completed
19 development of high-level options for risk-informing Part
20 50, and these options are described in a paper that
21 currently is before the Commission. This paper has been
22 released to the public to foster discussions during today's
23 briefing.
24 The staff will cover these high-level options
25 today along with other risk-informed initiatives. The

1 Nuclear Energy Institute and the Union of Concerned
2 Scientists have been asked to provide their views on key
3 issues that should be assessed and addressed in moving
4 forward on risk-informed regulation. I understand that
5 copies of the viewgraphs and that SECY-98-300 are available
6 at the entrances to this room.
7 I also would like to note that many of the
8 Agency's risk-informed and performance-based initiatives and
9 milestones are included in what is termed the staff's update
10 to the tasking memorandum response, which is issued monthly
11 and is available on the NRC's home page.
12 So unless my colleagues have any opening remarks,
13 Dr. Travers, please proceed.
14 DR. TRAVERS: Thank you, Chairman, and good
15 afternoon. This is the first of three Commission briefings
16 on recent staff efforts to improve some very important
17 Agency regulatory processes. Briefings on January 13 will
18 cover reactor licensing issues, and on January 20, the plant
19 oversight process.
20 Today's briefing will cover risk-informed
21 initiatives and is structured to provide an overview of the
22 overall Agency direction in that area. Included in this
23 overview are the status of the key risk-informed initiatives
24 described in my response to the Chairman's August 1998
25 tasking memo. This also includes a discussion of the recent

1 paper sent to the Commission, SECY-98-300, on risk-informing
2 10 CFR Part 50.
3 I think it's important to emphasize that we have
4 made progress in risk-informing Agency activities with many
5 specific actions under way or planned. These efforts have
6 involved extensive interoffice cooperation and have been
7 developed in an open and deliberate fashion with significant
8 opportunities for stakeholder input.
9 However, as you will hear today, there are still
10 significant challenges and work ahead if we are to fully
11 realize the benefits of risk-informed regulation. At the
12 table with me are Sam Collins, Director of NRR; Ashok
13 Thadani, Director of Research; Gary Holahan, who is the
14 Director of the Division of Systems Safety Analysis, NRR;
15 and Tom King, Director of the Division of Systems Technology
16 in the Office of Research.
17 And now I'd like to turn it over to Ashok to begin
18 the briefing.
19 CHAIRMAN JACKSON: Please. Thank you.
20 MR. THADANI: Thank you, Bill. Good afternoon.
21 May I have the first viewgraph, please.
22 I'm going to very quickly cover a little bit of
23 the background, and then both Tom and Gary are going to get
24 into some of the specifics of the paper that we have
25 transmitted.

1 The Commission has in fact long realized the value
2 of risk information in improving safety. Some of the
3 underlying bases for many of our current policies and
4 practices are the safety goal policy that has in it a
5 definition of quantitative health objectives as well as a
6 discussion of subsidiary objectives such as core damage
7 frequency, and they use these subsidiary objectives,
8 particularly the core damage frequency as well as the
9 containment performance in the regulatory analysis
10 guidelines document, wherein these criteria are used to
11 determine if in fact any new requirement would lead to
12 substantial improvement in safety or not.
13 Similarly we have as individual plant
14 examinations, for internal events as well as external
15 events, reports have been available. We have increased use
16 of probabilistic thinking in even areas like inspection and
17 so on, oversight.
18 As in fact the body of this knowledge and the
19 information has grown, the Commission recognized that it was
20 time to make much broader use of these insights and go
21 beyond what traditionally we had done -- when I say
22 traditionally, certainly over the past ten years or
23 longer -- focusing on generic design issues and applying
24 these techniques to operational experience. And this
25 philosophy was expressed in the Commission's PRA policy

1 statement as you noted, Chairman, which was issued in 1995
2 actually. The key step in this regard was the development
3 of a set of risk-informed regulatory guides and the standard
4 review plans over the last year, that these documents were
5 then used in terms of assessing -- evaluating license
6 amendments, so on.
7 The other activities under way include looking at
8 currently things like baseline inspection programs,
9 assessment of plants, and certainly risk-informing Part 50
10 of our regulations -- all of these activities taking up, as
11 you well know, a significant amount of resources, and
12 particularly NRR and Research have been working as a team to
13 address these issues. It's an interoffice effort. AEOD has
14 been fairly active as well in selected portions of these
15 activities.
16 Now because there are so many activities related
17 to things like data methods and applications of risk
18 information, it was important to ensure proper focus and
19 integration. To do that we have the PRA implementation
20 plan, which includes activities, responsibilities,
21 schedules, and the need for coordination of those. We
22 provide quarterly update in terms of the status of the
23 implementation plan to the Commission, and every six months
24 brief the Commission on the status of all these activities.
25 Today we're going to focus on the key ongoing

1 activities associated with Part 50, as well as some of the
2 reactor licensing issues. And unless you have questions,
3 I'd go to Tom King to discuss Part 50.
4 CHAIRMAN JACKSON: Let me ask you a couple of
5 quick questions.
6 MR. THADANI: Okay.
7 CHAIRMAN JACKSON: One really has to do with the
8 following question, and that is how -- you mention
9 interoffice activity -- but how are you ensuring a
10 consistent approach to risk-informed regulation, in that
11 whether you're talking plant activities or systems,
12 structures, and components, that there's a consistency of
13 methodology or approach across all Agency functions in that
14 regard?
15 MR. THADANI: In fact that is the issue of making
16 sure that we have the right infrastructure in place. An
17 example was the regulatory guides that we develop for
18 specific licensing applications, but in the Part -- as a
19 matter of fact in the Part 50 paper we had discussed some of
20 the implementation issues, and it was Attachment -- it was
21 actually I remember the last one on implementation issues
22 for risk informing Part 50 where we not only focused on the
23 need for metrics acceptance guidelines and so on, but also
24 the importance of making sure there's consistent use in
25 various areas. And it talks about conforming the need to

1 make sure we have conforming regulatory guides and standard
2 review plans integrating with oversight activities as well,
3 and also to make sure that various rules are implemented in
4 a consistent manner.
5 CHAIRMAN JACKSON: But you've told me what's on
6 the printed page. I guess I'm really asking the following
7 question. We're going to be having a series of briefings on
8 assessment, on inspection.
9 MR. THADANI: Yes.
10 CHAIRMAN JACKSON: Et cetera. Am I going to hear
11 the same approach as the one you're taking to talking about
12 risk informing Part 50 or risk-informed licensing actions?
13 DR. TRAVERS: Yes, Chairman, you are. The same
14 management team fundamentally sitting before you is
15 responsible for assuring the kind of consistency that I
16 think you're addressing. In part Ashok referenced the fact
17 that we have a PRA Steering Committee at a very high level.
18 Sam Collins is a member of that. Ashok chairs it. So
19 we're -- NMSS as well. So we're trying to bring together
20 the principal senior management staff that are responsible
21 for bringing and assuring that very kind of consistency that
22 you mentioned.
23 CHAIRMAN JACKSON: Okay, the second and last
24 question. Along the lines of building upon the current
25 infrastructure policies and practices, I've heard that some

1 licensees feel we're talking about a kind of a risk-plus
2 environment in which risk information leads to an additional
3 body of requirements without any concomitant reduction in
4 burden, or I've heard criticism the other way, not from the
5 industry, but from those in the public, that one will use it
6 to reduce burden without looking at the balance in terms
7 of -- or have the guts to make, you know, if there are
8 additional things that are brought up that need to be
9 focused on that we won't do it.
10 Would any of you care to comment on that?
11 MR. THADANI: Certainly. I think it's an issue
12 that's been brought up before. I think -- I'll give you my
13 views. I think if we were to risk inform our activities and
14 our regulations based on my understanding I think overall I
15 believe that would lead to a reduction in burden. I believe
16 that. But on the other hand I also think that there may be
17 areas where there may be need to strengthen, make
18 improvements, but clearly they would have to be driven, if
19 these are new requirements, they'll have to meet our
20 regulatory analysis guidelines to demonstrate in fact that
21 they would be substantial additional safety gains as well as
22 cost-effective. So my answer would be I think overall I
23 expect there will be burden reduction, I would also expect
24 there may be some areas where we have to tighten up certain
25 things.

1 MR. HOLAHAN: Maybe it would help if I give a
2 specific example. It might have come up later in the
3 presentation, but I think it might be helpful here. I think
4 because the staff is focusing firstly on maintaining safety
5 and then as appropriate, you know, reducing unnecessary
6 burdens, we have examples like the Comanche Peak in-service
7 testing program, which we approved back in August. Out of
8 634 valves in the plant, 516 were classified low safety
9 significance and are there, you know, by that classification
10 are given reduced requirements, you know, stretched out
11 testing. Twelve out of 33 pumps were found to have low
12 safety significance and have their requirements reduced.
13 But as a part of the same analysis, 25 components not
14 covered by any of the ASME codes were identified as
15 safety-significant, and their treatment was elevated to the
16 treatment typically given to code components.
17 So that program has both reductions in
18 requirements and increases based on the safety significance
19 of the components. And that's the kind of balance that we
20 look for in these programs.
21 COMMISSIONER DICUS: Well, overall is it more or
22 less, though? Are you coming out about the same --
23 MR. HOLAHAN: Well --
24 COMMISSIONER DICUS: In these examples that you
25 gave?

1 MR. HOLAHAN: In the examples that we've seen,
2 there is generally an improvement, an increase in safety,
3 because what we're doing is we're reducing requirements on
4 components that really have very little impact on safety.
5 And so even though the number of components that are
6 increased is smaller, you know, by their very nature they're
7 more important than the ones that you've reduced the
8 requirements on.
9 COMMISSIONER DICUS: So an increase in -- I don't
10 know if I'm on -- okay, an increase in safety and reduction
11 in unnecessary regulatory burden was achieved, or --
12 MR. HOLAHAN: In these cases -- in the examples
13 we've seen so far I think it's fair to say we have both
14 improvement in safety and a reduction in burden.
15 CHAIRMAN JACKSON: Reduction in burden -- I think
16 your point is reduction in burden is not inconsistent with
17 improvement in safety --
18 MR. HOLAHAN: That's right.
19 COMMISSIONER DICUS: Exactly.
20 CHAIRMAN JACKSON: Because of the fact that by
21 having people focus where they ought to focus and not hang
22 them up with trivia --
23 MR. HOLAHAN: Yes.
24 CHAIRMAN JACKSON: You give them the opportunity
25 to really focus.

1 MR. HOLAHAN: Exactly.

2 CHAIRMAN JACKSON: But I think the concern that
3 people have is that the Agency will look to reduce burden,
4 but if it finds something that does require more attention
5 or should because of its risk significance, the question is
6 whether our processes are going to be structured so that
7 they get dealt with and whether in fact the staff and/or the
8 Commission is going to have the guts to in fact make it
9 happen.

10 MR. THADANI: Chairman, clearly we have an
11 obligation, we in fact have a number of activities which
12 look at operational experience and other sources of
13 information to see if there are potential problems that
14 might require attention as well.

15 CHAIRMAN JACKSON: Okay.

16 MR. HOLAHAN: I think there's another general
17 category that's a very good example here, and that is by
18 reducing requirements on diesel generator testing to allow
19 the testing to be done online, in fact what it appears is
20 that outages are being conducted safer. South Texas
21 recently had a very short outage, and during that outage,
22 they kept all of their safety equipment available, no
23 maintenance on safety equipment. And that maintenance was
24 allowed to be done online because we extended the allowed
25 outage times. And I think, you know, some of these issues

1 inherently have in them improved safety and reduction in
2 costs.
3 CHAIRMAN JACKSON: Okay.
4 COMMISSIONER McGAFFIGAN: Madam Chairman --
5 CHAIRMAN JACKSON: Yes.
6 COMMISSIONER McGAFFIGAN: Can I just follow up on
7 Mr. Holahan?
8 The example you give of the Comanche Peak
9 in-service inspection, you said 25 of the components were
10 not covered currently by the rules, by the ASME code, which
11 is captured in our rule I guess at 50.55(a), right?
12 MR. HOLAHAN: Exactly. Yes.
13 COMMISSIONER McGAFFIGAN: In a case like that,
14 having discovered this, is this a generic -- would these
15 components be important generically, and the next time you
16 do 50.55(a) would it pass backfit muster to include these
17 components as -- or words that would have the effect of
18 these components being covered by 50.55(a), or is it in this
19 case looking at this particular relief these came up, and
20 I'm just trying to understand what you're saying with regard
21 to these safety-significant components that weren't covered.
22 MR. HOLAHAN: I think it's hard to say in general.
23 When noncode components turn out to be important in a plant,
24 very often it's because of very specific circumstances that
25 they may not be generic. But the whole concept that we're

1 going to talk about later of risk informing Part 50 would
2 automatically capture these sorts of components. In other
3 words, if we change our definition of what's important from
4 what's in the Code to those things that have risk
5 significance, these 25 components automatically come within
6 scope, and the other 500 which are less important probably
7 drop out of scope.
8 COMMISSIONER McGAFFIGAN: The interesting thing is
9 only why the, you know, the maintenance rule uses broad
10 language, although I guess maybe the scope -- I mean the
11 thrust of the maintenance rule was to bring more things that
12 weren't directly safety into our purview, and it's
13 surprising that these items wouldn't have been caught by the
14 maintenance rule as something that either PRA or
15 deterministic analysis of the review panel had found to be
16 significant.
17 MR. HOLAHAN: Oh, I think -- and I can't speak
18 definitively on these 25 -- but I wouldn't be surprised if
19 they were captured by the maintenance rule. But remember,
20 the in-service testing requirements are much more stringent
21 than the maintenance rule. This is quarterly testing. The
22 maintenance rule is at much less burdensome level.
23 DR. TRAVERS: I was just going to point out that
24 we are talking in the paper about a number of requirements
25 that have somewhat different scopes, and the risk-informing

1 approach that we've proposed would take those scopes
2 potentially, you know, under Option 2 and risk-informed as
3 one option for Commission consideration, taking those 50.59,
4 ASME, tech specs, QA, NIS IST, those kinds of
5 risk-informed --
6 CHAIRMAN JACKSON: The other is to come up with an
7 approach that is an overall coherent approach to defining
8 scope, which would then have a plant-specific actualization,
9 but the approach and the methodology would be the same,
10 right.
11 DR. TRAVERS: Exactly.
12 CHAIRMAN JACKSON: Okay.
13 MR. THADANI: Tom King.
14 MR. KING: Thank you. I'm going to talk about the
15 risk-informed proposals for modifying Part 50, and if I
16 could have Slide 3, please. We have got Slides 3 through 7
17 on this topic in the presentation. We wanted to spend a
18 little more time on this because of the important nature of
19 this proposal rather than just speak to it as achievement of
20 another milestone, so what I want to do is walk through what
21 we are proposing and why we are proposing it.
22 On Slide 3, to try to put this activity in
23 context, SECY-98-300 is proposing at a high level some
24 direction for risk-informing Part 50. It is not a
25 rulemaking plan and there are still a lot of details that

1 need to be worked out, but there's enough issues and enough
2 important material that need to be dealt with upfront that
3 this is a very important paper and has some very important
4 policy decisions and recommendations in it.
5 The paper itself basically has three major
6 elements. There's changes to the scope of what's regulated
7 by Part 50, there's an option to modify specific regulations
8 in Part 50, getting into the technical content, and there's
9 a piece that deals with clarification of Staff authority,
10 which is really a parallel activity to modifying Part 50.
11 CHAIRMAN JACKSON: Let me ask you a quick
12 question. Again, you know, the paper is available, but just
13 for clarification, are you referring to the scope of Part 50
14 or its individual subparts, such as 50.59?
15 MR. KING: No, we are referring to the scope of
16 systems, structures and components that are regulated by
17 Part 50. When we talk about changes to scope, that is what
18 we are talking about.
19 CHAIRMAN JACKSON: But not on a subpart to subpart
20 or reg by reg basis?
21 MR. KING: Well, in Option 2, which starts out
22 dealing with systems, structures, and components that we
23 call those that receive special treatment, and those are
24 operational and pedigree type issues, the scope changes
25 would be limited to the regulations that deal with those

1 kinds of things -- QA, equipment qualification and so forth.
2 If we proceed further and get into the broader
3 changes where we could actually get in and change some of
4 the design requirements in Part 50, then the scope changes
5 would extend to the design aspects as well.
6 CHAIRMAN JACKSON: So it sounds like to me you are
7 really talking about the scope of individual subparts?
8 MR. KING: Yes -- for Option 2 we are talking
9 about the scope of subparts that deal with operational and
10 pedigree type issues, yes.
11 CHAIRMAN JACKSON: And when you speak of
12 clarification of Staff authority, could you clarify that for
13 us and talk about how it relates to modification of 10 CFR,
14 Part 50?
15 MR. KING: What the paper talks about is what can
16 the Staff do for those licensees that do not wish to
17 participate in risk-informed activities, whether it is
18 risk-informed Part 50 or the Reg Guides that are out on the
19 street today. There have been a lot of internal discussions
20 in the Staff regarding what authority does the Staff have to
21 take risk information and require licensees to do something
22 different beyond what is in the current regulations, and
23 because of the amount of discussion that has taken place
24 internally and because of the fact that the Staff has been
25 faced with those kinds of situations, we felt it was

1 worthwhile to propose that the Staff actually put down
2 guidance for the Staff as to how to treat those situations.
3 If you recall, the safety and compliance white
4 paper that the Commission issued probably about a year ago,
5 this issue was discussed there and made it clear that the
6 Staff certainly has the authority to require things beyond
7 what are in the regulations if there is a good safety reason
8 to do so, and also went further and said that guidance
9 should -- that kind of instruction should be implemented in
10 Staff guidance and in any other document that it needs to be
11 put in, and this is an attempt to also try and implement
12 what that white paper called for.
13 Another item of background that I wanted to
14 mention was the NEI Whole Plant Study, which you have all
15 heard about in the past. That is an activity that is being
16 coordinated by NEI, but it involves three pilot plants --
17 South Texas, San Onofre, and Arkansas Nuclear 1. It was an
18 initiative by the industry to take a look at the regulations
19 where plants are spending operations and maintenance costs,
20 other requirements that come about from regulation --
21 generic letters and so forth -- and to see if the risk
22 really matches the expenditure of operations and maintenance
23 costs.
24 We feel that at the time it was proposed was a
25 good activity to do. We feel now that we are talking about

1 risk-informing Part 50, that this is an activity that can be
2 of direct use to our work in risk-informing Part 50, that
3 the types of basic information that they are developing will
4 help us better risk-inform Part 50, that these plants could
5 serve the purpose of some pilot plants in trying to test out
6 the various options and the various alternatives for
7 risk-informing Part 50.
8 We have had discussions with NEI and the Whole
9 Plants pilot plants regarding use of the Whole Plant Study
10 in that capacity and at this point we believe we have
11 reached agreement that that is an activity that -- or
12 purpose of the Whole Plant Study that makes sense, that even
13 though in the response to your tasking memo we say it's
14 subsumed into the Part 50 update, that doesn't mean that it
15 is not being done. It just means it is not being done as a
16 separate activity, that these two activities have come
17 together to support each other.
18 CHAIRMAN JACKSON: So are you saying that the use
19 of the NEI Whole Plant Study depends upon the option or
20 options chosen for risk-informing Part 50?
21 MR. KING: Clearly how the NEI Whole Plant Study
22 will be factored in to risk-informing Part 50 depends upon
23 the guidance we receive from the Commission.
24 CHAIRMAN JACKSON: Okay.
25 MR. KING: All right. With that, let's turn to

1 Slide 4 and talk about the objectives of the Part 50
2 modification and why are we proposing to modify Part 50 at
3 all to be risk-informed.
4 The paper defines three specific objectives, and
5 these are summarized on Slide 4.
6 The first one is to enhance safety by focusing NRC
7 and licensee resources in areas commensurate to their
8 importance to safety. Now, as you talked about earlier,
9 this is a two-edged sword. This means some things could be
10 removed from regulation that aren't important and other
11 things could be brought in. In that sense, it can improve
12 safety and it can reduce unnecessary burden.
13 The second objective -- to provide NRC with a
14 framework to use risk information to take action in all --
15 it should say reactor regulatory matters, since this is a
16 reactor regulation. Again this gets back to if licensees
17 choose to use risk-informed alternatives, we feel that the
18 framework that needs to be set up in Part 50 will provide
19 the basis for NRC to document that and to factor that into
20 the inspection program, the enforcement program and so
21 forth.
22 In parallel with that activity is the one we
23 talked about on the previous slide about developing some
24 guidance for the Staff to use and how you would use risk
25 information for those licensees that don't choose to go to a

1 risk-informed approach.

2 Then finally risk-informing Part 50 would allow

3 the use of risk information to provide flexibility in

4 licensing and operational issues. That deals with the issue

5 that risk from plants is very plant-specific. Plants are

6 different in many respects. They have different features,

7 different practices, different operating experience. To get

8 credit for that, you really need to allow plants to use a

9 plant-specific risk assessment and one of the objectives of

10 Part 50 would be to allow that to take place.

11 CHAIRMAN JACKSON: I have a request for you, as

12 you go forward in the briefing, and then I have a specific

13 question.

14 The request is that as you talk through the

15 options I would like you to tell the Commission the extent

16 to which you feel the option under discussion in fact meets

17 these objectives, okay? And then the second, the question,

18 the specific question, is to what extent are these same

19 objectives, and maybe this is a question more for Mr.

20 Travers, being applied in our other regulatory programs --

21 that is, in the medical, the fuel cycle arenas, waste,

22 decommissioning, et cetera.

23 DR. TRAVERS: In addition to mentioning that NMSS

24 plays a role, an important role, in the PRA Steering

25 Committee, I think Carl can address -- if you want to just

1 take one minute --

2 CHAIRMAN JACKSON: Yes.

3 DR. TRAVERS: -- some of the activities that are

4 underway.

5 CHAIRMAN JACKSON: Well, it's a simple question.

6 The question is are the objectives the same. That is all I

7 am really asking -- not the activities, but are the

8 objectives the same.

9 DR. TRAVERS: They are the same generally -- well,

10 as they apply to their individual areas, whether it is

11 materials, for example, enhancing safety, safe use of

12 materials, certainly they provide a framework in which to

13 carry out and make regulatory judgments, and the use of risk

14 to provide some flexibility where it is warranted.

15 CHAIRMAN JACKSON: So you are shaking your head

16 and you agree?

17 DR. PAPERIELLO: Yes, Madam Chairman.

18 CHAIRMAN JACKSON: All right. Okay.

19 COMMISSIONER MERRIFIELD: Madam Chairman?

20 CHAIRMAN JACKSON: Yes, please.

21 COMMISSIONER MERRIFIELD: I want to go back to the

22 earlier point that Mr. King made.

23 In effect, what we are doing is we are creating

24 two classes of licensees, those who choose to be

25 risk-informed and those who choose not to be risk-informed.

1 How do we go about managing that type of voluntary
2 approach from an inspection, enforcement and licensing
3 perspective, and most importantly, have we looked at the
4 resource and training implications, not only as it relates
5 to licensees but also to ourselves, in grappling with two
6 different sets of rules?
7 MR. KING: One of the policy issues in front of
8 the Commission in this paper is the question of mandatory
9 versus voluntary.
10 The Staff has recommended that the risk-informed
11 modifications to Part 50 be applied on a voluntary basis, in
12 which case you would then have two sets of licensees, as you
13 suggest.
14 We have looked at the issue of training for the
15 Staff and the resource estimates that are admittedly very
16 rough in the paper. That kind of issue was considered in
17 putting in those resource estimates, and also recognizing
18 that licensees have to do training and rewrite procedures
19 possibly as well.
20 In terms of the inspection program, the inspection
21 program is being revised to be risk-informed today. That is
22 our program. It is not a licensee program, and that is
23 being applied or would be applied to all plants if the
24 Commission agrees. We would expect that as we proceed into
25 risk-informing Part 50 that the risk-informed changes to

1 Part 50 would mesh very closely with the risk-informed
2 adjustments that have been made to the inspection program,
3 so in that respect these risk-informed changes to Part 50 we
4 are talking about will match up very closely with the
5 risk-informed changes that are being proposed under the
6 inspection program, but recognizing that if there are two
7 classes of licensees, the inspection program is still going
8 to be risk-informed, so it is not that we are going to have
9 two inspection programs but clearly we'll have two sets of
10 maybe design basis, if you will.
11 CHAIRMAN JACKSON: Does it come into play in
12 enforcement?
13 MR. KING: Maybe Mr. Travers had better answer
14 this than me --
15 MR. HOLAHAN: I think I can answer it. In
16 effect -- the endpoint is that each licensee ends up with a
17 current licensing basis or a licensing basis derived from,
18 you know, some set of requirements, either a risk-informed
19 set or from the traditional set. The inspection and
20 enforcement program are against the licensing basis of that
21 plant. It's an individual basis.
22 I think part of this issue we are already facing,
23 at least in a piecewise manner, if some licensees are
24 risk-informing the ISI program and the IST program, then our
25 inspection and enforcement program are already dealing with

1 the fact that for this plant some valves don't need to be
2 tested, and not testing them isn't a violation. It is in
3 fact, you know, consistent with their licensing basis, so we
4 are dealing with dozens of unique licensing bases already.
5 DR. TRAVERS: But I think it is fair to say at
6 this stage, a propos to your first question, at this very
7 early stage we don't have detailed insights into the
8 resources. Clearly, if we set up a path or if the
9 Commission agrees to go forward with a voluntary program, it
10 is going to suggest the need for more resources, in my view,
11 to implement a program that would be responsive to both
12 those who choose to take up the risk-informed mantle and
13 those who don't choose to do that.
14 For example, plants that are nearing end-of-life,
15 not thinking about going for a license renewal of sorts,
16 those are the licensees that we anticipate and in fact have
17 told us that the investment it would take to enter into the
18 risk-informed realm would be one that they wouldn't find
19 very attractive.
20 So what we are suggesting is that in the context
21 of developing a further rulemaking plan, we would have to
22 take a more definitive look at that kind of issue.
23 CHAIRMAN JACKSON: Mr. Collins, did you have any
24 comments on this particular issue?
25 MR. COLLINS: I think it is a very important

1 issue. It's many-faceted, however. In some instances I
2 believe our programs which are being risk-informed,
3 including to some extent the enforcement program, as that
4 progresses in the inspection program, will become more
5 coherent as they are aligned with risk-informed licensing
6 bases and the implementation of that.
7 We are almost in a pluralistic system now where
8 many of our processes are moving down the road but some of
9 the underpinnings --
10 CHAIRMAN JACKSON: -- are not there.
11 MR. COLLINS: -- of the process are not, so
12 there's not always a clean meshing of those.
13 On the other hand, I think to say that all
14 licensees would embrace a total risk-informed Code of
15 Federal Regulations is probably too optimistic at this
16 point.
17 CHAIRMAN JACKSON: Well, it is an interesting
18 point also from a legal perspective. If you risk-inform
19 Part 50, whatever that means and whatever option the
20 Commission goes for, those are the regulatory requirements.
21 Therefore, how do you keep two books?
22 MS. CYR: Under the Commission's requirements of
23 the backfit rule, if you made a change you would have to
24 maintain two sets of books. We have done that in the past.
25 CHAIRMAN JACKSON: Okay.

1 MS. CYR: If you could not make a case that it
2 provided substantial and reasonable protection to change the
3 requirement across the board, you would maintain existing
4 regulatory requirements for those plants to which it still
5 remained applicable, and you would have a new requirement
6 which would apply to those -- it would be an option
7 available to those licensees who chose to take advantage of
8 it.
9 CHAIRMAN JACKSON: And if it did meet the backfit
10 test?
11 MS. CYR: If it did meet the backfit test, the
12 Commission could choose to apply it across the board.
13 CHAIRMAN JACKSON: Could choose to apply it across
14 the board. Okay. So as you go forward, please tell us how
15 the options -- on, I'm sorry. Commissioner Dicus had a
16 question.
17 COMMISSIONER DICUS: Yes. The Staff I think has
18 been criticized by the industry in the past for being
19 inconsistent in its inspection program and application of
20 regulations and following up on Commissioner Merrifield's
21 comment, I am concerned with the two sets of licensees and
22 setting up two sets of books that this may increase this
23 inconsistency.
24 MR. HOLAHAN: I would comment on that.
25 I think it doesn't necessarily make it worse but I

1 think it doesn't make it better, okay? I think it's a
2 complicated situation and having multiple sets of
3 requirements perhaps would increase the likelihood of some
4 inconsistencies because there's more difficulty in training
5 people to deal with those situations, but it doesn't
6 necessarily cause that problem. It's just more difficult to
7 implement that.
8 MS. CYR: We already have situations where we have
9 multiple sets of applications and requirements. We have a
10 lot of requirements that came into place and they didn't
11 apply to plants who already had licenses. The new
12 requirements came in and we differentiated between when they
13 got their licenses or didn't. I mean depending again on
14 what the scope of the changes that the Commission makes in
15 this case, you may have a greater number of those situations
16 or not, so I don't think it is necessarily introducing
17 anything different than what we have dealt with in the past.
18 I think Gary's point, that every plant now has a
19 current licensing basis which is unique to it, depending
20 on -- based on a lot of, depending on whether it has the new
21 tech specs or the old tech specs, depending again on the
22 degree of specificity in its FSAR, so I mean it's
23 introducing some additional complexity but I don't think I
24 would get hung up on that.
25 CHAIRMAN JACKSON: I think, though -- I mean I am

1 trying to get some clarity on the issue of risk-informed
2 versus not risk-informed license conditions -- vice
3 risk-informed Part 50, which is your fundamental Code of
4 Federal Regulations for power reactors and other reactors
5 too, but that is what I am really trying to understand here.
6 MR. HOLAHAN: Well, what we are talking about here
7 is risk-informing the Code of Federal Regulations, either in
8 Option 2 or in Option 3 to a more or less extent.
9 CHAIRMAN JACKSON: I guess I am really posing the
10 question somewhat to the Commissioners.
11 MS. CYR: I mean the existing set of regulations
12 the Commission continues to believe that that provides an
13 adequate level of protection if a plant operates within the
14 confines of that requirement. What you are proposing to do
15 is come up with, in a sense, a different set of
16 requirements, which you develop from a different basis.
17 Instead of starting out with positing your accident
18 scenarios and assessing against them, you are coming up and
19 using risk information to describe what systems you have to
20 operate at a certain level and so on -- coming at the same
21 question from a different point of view, so I mean there
22 essentially can be two answers, so the question is how could
23 you safely operate a nuclear power plant.
24 We have one that we developed over a period of
25 years, which is our current framework, and now we are saying

1 there is a different way we could do it, because now we have
2 more information about how to quantify that and we are going
3 to come up with what may be in a sense a different or an
4 overlapping answer.
5 CHAIRMAN JACKSON: But let me make sure I
6 understand. You are saying we have a Part 50 and a Part 50
7 prime?
8 MS. CYR: Right.
9 CHAIRMAN JACKSON: Okay, so we are not really
10 replacing one set of regulations with another.
11 MS. CYR: Or may have a 50.46 and 50.46 prime. I
12 mean depending again --
13 CHAIRMAN JACKSON: That is what I was asking when
14 I said are you risk-informing Part 50 or are you
15 risk-informing subparts of Part 50.
16 DR. TRAVERS: In Option 2 we would be
17 risk-informing subparts but in addition we have proposed to
18 undertake a study to see how we might further develop I
19 think the point you are making, and that is the further
20 risk-informing of the broader set of requirements covered
21 under Part 50.
22 CHAIRMAN JACKSON: No, all I am really saying is
23 we just have to be clear.
24 DR. TRAVERS: Yes.
25 CHAIRMAN JACKSON: If in fact -- if we are doing a

1 parallel Part 50, then that is a separate issue, and what
2 you are talking about pertains, but if you replace one
3 regulation with another that covers some aspect of our
4 oversight, then that is what exists if it passes all the
5 tests for it to come into existence, and I don't see then
6 that you have some set of regulatory requirements.
7 However that plays out in the specific case can be
8 different but there can be no confusion about the fact of
9 what the fundamental requirement is, and so that is what I
10 am saying in terms of being clear -- are we going down a
11 path where you are talking about a Part 50 and a Part 50
12 prime and you are going to have both of them, or are you
13 going to have a new Part 50, because presumably to have a
14 new Part 50 means it has to pass the backfit test.
15 MS. CYR: I think the proposal in Option 3 is if
16 you fully implemented Option 3 you would have a 50 to 50
17 prime.
18 MR. THADANI: That is correct and in fact there
19 would be -- Chairman, if I might -- I think it will raise
20 some other issues as well, and some of our recent
21 regulations like station blackout for example was backfit,
22 which was based on enhanced safety considerations and not
23 adequate protection considerations.
24 If one goes to risk-inform Part 50, one would have
25 to deal with this issue of what is adequate protection and

1 what is the run of risk in terms of definition.

2 CHAIRMAN JACKSON: Right. I mean all I am trying

3 to say is it is an important question to be addressed.

4 MR. THADANI: Yes.

5 CHAIRMAN JACKSON: And to be clear on -- because

6 one approach is to say here is the old Part 50 or a subpart

7 of it. Here is the new one. This is all there is in this

8 arena. If that is the case, that is the law of the land.

9 We go through the right regulatory process.

10 The other way is here's the old Part 50, here's

11 the new Part 50, but the new Part 50 has a Part A, which is

12 the old Part 50, and it has a Part B, which is the

13 risk-informed Part 50 and now they are equal opportunity

14 regulations, so we just have to be clear, otherwise there is

15 confusion, there is a legal risk, and there is zero public

16 credibility.

17 MR. HOLAHAN: Let me see if I can help.

18 If the Commission decides to make either Option 2

19 or 3 mandatory, there would be one set of Part 50

20 regulations that apply to everyone. It would be just that

21 one set.

22 If the Commission decided to make it voluntary,

23 then we would have to have a mechanism for licensees to

24 choose and whether it is A-B or whether the wording of each

25 regulation inherently allows to do --

1 CHAIRMAN JACKSON: It doesn't matter how you
2 structure it. The question is you just have to be clear on
3 what you are doing. Commissioner?
4 COMMISSIONER McGAFFIGAN: I just want to -- we are
5 probably being premature. We should have given you a chance
6 on the options first, but under Option 2 -- you earlier said
7 you were talking about risk-informing 50.46, for example,
8 and under Option 2 you are mostly working on scope,
9 right? -- scope and definitions?
10 MR. HOLAHAN: Yes.
11 COMMISSIONER McGAFFIGAN: Is it the intent if a
12 licensee chooses to use the risk-informed scope in one
13 area -- say 50.46 -- and then there's a risk-informed scope
14 in 50.65 and a risk-informed scope in 50.59, that they take
15 the whole package? I mean I can draft language so that
16 there's a savings clause that says you take Option B all the
17 way through, you don't go back and forth depending on which
18 is most advantageous to you, or I can imagine just doing
19 50.46 and then 50.65 and then 50.59, et cetera.
20 Which is your intent? This is really the
21 Chairman's previous question. Is the intent that it is a
22 package across Part 50 or is it the intent you take each
23 item one by one?
24 MR. HOLAHAN: The recommendation is that it is a
25 package but it wouldn't include 50.46 because that is a

1 design requirement --

2 CHAIRMAN JACKSON: That is the design

3 requirements, right.

4 MR. HOLAHAN: But the other examples -- the Staff

5 proposal is that if a licensee chooses a risk-informed

6 alternative, that alternative would include being consistent

7 in using risk information in the maintenance rule, QA --

8 CHAIRMAN JACKSON: So it is not cherry-picking?

9 MR. HOLAHAN: It's not cherry-picking.

10 MR. KING: And that gets back to your first point,

11 which is -- early in the meeting -- which is if you really

12 want to make the first objective come true, which is enhance

13 safety, which means bring some things in and take some

14 things out, you can't allow cherry-picking, otherwise it

15 will just be take things out. Really to achieve the first

16 objective it has got to be looked at as a whole package.

17 COMMISSIONER McGAFFIGAN: May I just -- so the

18 General Counsel is clear that every time you do, under the

19 Staff proposal the language each time would say here is a

20 set of definitions and scope that we have today. Here is

21 the alterative. If you choose the alternative here, you are

22 also choosing the alternative under -- and name the list?

23 MS. CYR: I think theoretically you could do it

24 either way but it would be much more difficult to do it

25 regulation by regulation because you would have to make sure

1 that you guarded against the thing which Tom mentioned,
2 which is that you, by permitting them to take something here
3 and not doing something here, it would become a much more
4 complicated analysis to make sure that by permitting them to
5 do that that you have not diminished safety below a level
6 which you could accept.
7 I mean I think theoretically you could get to a
8 point where you could do that. It would just be much more
9 complex.
10 COMMISSIONER McGAFFIGAN: I am not sure that we
11 are going to make our goal for reducing the length of our
12 regulations if we do this.
13 MS. CYR: But their proposal is that if you pick
14 it one place, you pick it every place.
15 CHAIRMAN JACKSON: Right.
16 MR. KING: Right.
17 CHAIRMAN JACKSON: Commissioner?
18 COMMISSIONER McGAFFIGAN: Well, we seem to be on
19 Option 2 and I have an Option 2 question --
20 [Laughter.]
21 CHAIRMAN JACKSON: Well, I'll tell you what --
22 let's flip the page. Let's flip the page because Option 1
23 has one dot on it --
24 MR. KING: Let's to go Slide 5 and talk about the
25 three options.

1 Option 1 is basically sometimes called the "do
2 nothing" option but basically it is proceed with the things
3 that are ongoing today.
4 CHAIRMAN JACKSON: This will not be the "do
5 nothing" Commission.
6 MR. KING: And we have a number of rulemakings
7 that involve some risk-informed concepts in them that are
8 listed here.
9 We also have the Reg Guides that are on the street
10 and licensees would continue to be able to use those.
11 These activities under Option 1 are in the current
12 budget and rulemaking plans.
13 Option 2 now goes beyond that. It would still
14 continue the Option 1 activities but, as we discussed
15 earlier, it proposes to risk inform the scope of some
16 selected regulations that deal with systems, structures and
17 components that receive special treatment, things like
18 quality assurance, equipment qualification, seismic, those
19 kinds of things.
20 It could also apply to some processes -- for
21 example, going beyond, in 50.59, beyond the current
22 rulemaking to further risk-inform 50.59 is one of the things
23 that could be included under Option 2.
24 Option 2 would have a restriction that licensees
25 would not be allowed to physically remove the equipment from

1 the plant. They may treat it differently in terms of its
2 quality but that they wouldn't be able to take it out.
3 The other thing we are proposing to do under
4 Option 2 is use the maintenance rule as a first step in
5 developing a risk-informed scope of what should be regulated
6 under this Option 2 and use that as a test case to see what
7 metrics we use, what criteria we use for defining that scope
8 and try it out using the maintenance rule.
9 Again the NEI Whole Plant Study plants would be
10 likely, pilot plants, to test Option 2, and the Staff
11 recommends that we proceed with Option 2 at this point. We
12 feel that there's enough information available to actually
13 start working with the pilot plants and start rulemaking
14 activity to implement Option 2. I think there would be a
15 high payoff in safety and effectiveness and reducing
16 unnecessary regulatory burden, and it would be a step toward
17 making Part 50 consistent with the risk-informed plant
18 oversight process that is being developed.
19 COMMISSIONER McGAFFIGAN: Jeff had a question.
20 CHAIRMAN JACKSON: Oh, I'm sorry.
21 COMMISSIONER MERRIFIELD: In SECY 98-300 the Staff
22 states, and I quote, "Under Option 2 systems, structures and
23 components of low safety significance would move from
24 'special treatment' to normal industrial treatment but would
25 remain in the plant" -- would remain in the plant -- and I

1 emphasize that -- "and be expected to perform their design
2 function without additional margin, assurance, or
3 documentation associated with high safety significant SSCs."
4 Can you explain to me the regulatory mechanism by
5 which we would prevent, the NRC would prevent licensees from
6 removing these SSCs if appropriate under 10 CFR 50.59?
7 MR. KING: Well, as a condition in approving the
8 change, if a licensee came in and said I want to do this,
9 then they would submit a proposal to do it, and as part of
10 approving that change a condition could be written into that
11 approval that those systems, structures and components are
12 to remain in the plant, documented in the FSAR, whatever the
13 right documentation is.
14 DR. TRAVERS: But more fundamentally, what we are
15 talking about dealing with are regulations that address
16 treatment as opposed to the general design criteria, for
17 example, which establish the need for these kinds of systems
18 to be in place and functional, so we are talking about not
19 altering the design of the facility or the design
20 requirements that went into our licensing judgments at the
21 time the facility was licensed but more focusing on
22 operational treatment of the equipment that is in the plant
23 and would remain in the plant and expected to carry out its
24 functions.
25 COMMISSIONER MERRIFIELD: So it is fully your

1 anticipation that there would be no equipment change as a
2 result of this?
3 DR. TRAVERS: That is the expectation, yes.
4 MR. HOLAHAN: Well, I think what we are
5 envisioning, and the words have not been developed, what we
6 are envisioning is if equipment is to be removed from the
7 design, that would be done through a license amendment
8 process or if that equipment is called for directly in a
9 regulation through an exemption process, but these treatment
10 issues are things that licensees could do largely on their
11 own.
12 DR. TRAVERS: Right -- not through this process.
13 CHAIRMAN JACKSON: Commissioner McGaffigan.
14 COMMISSIONER McGAFFIGAN: This follows up my
15 previous question, namely you say 50.65 might be an early
16 place where you would apply this, but from a previous
17 discussion if there's going to be -- it seems like you have
18 to do it all at once, lest the cherry-picking you were
19 talking about, you know, if you don't move entirely to these
20 different scope and definitions simultaneously everywhere,
21 if that is the Staff proposal, how do you then talk about
22 50.65 being first?
23 MR. HOLAHAN: We have had a lot of discussion on
24 this subject and I know NEI has a bit of a different view of
25 that I'm sure they will express later. I think what we have

1 said is even though you may make the maintenance rule the
2 first place where you applied it, you wouldn't define that
3 scope until you have thought of the implications of that
4 scope on the other regulatory requirements, so you would as
5 best you could try to lay out logically what should the
6 scope be for QA, what should the scope be for maintenance --
7 CHAIRMAN JACKSON: And if you are going to do
8 that, why not do it all across the board? I mean if you
9 have got to do that degree of analysis to ensure that the
10 one thing does not damage the other -- I'm confused.
11 MR. HOLAHAN: Well, what the Staff has recommended
12 in effect is --
13 CHAIRMAN JACKSON: Unless whatever the template is
14 you work out for the maintenance rule, once we are convinced
15 that it works is immediately propagated across all the other
16 rules.
17 I mean -- but I don't believe you can just go
18 piecemeal, one-at-a-time.
19 MR. HOLAHAN: I think you have to do the logic
20 together, but then you could implement it one after another,
21 but I think that would be shortly because you will have made
22 all the major decisions.
23 CHAIRMAN JACKSON: I don't understand. Now I
24 think that is a difficult approach -- I don't know.
25 Mr. Thadani, do you have a point of view, here --

1 Mr. PRA here?

2 MR. THADANI: It seems to me that if we do it in
3 a -- I think the issue is going to be how comprehensive you
4 are up front, and that seems to me should be driven by where
5 you're going to apply the results. If we do it fairly
6 comprehensively up front then it seems to me that we ought
7 to be able to apply it clear across, but if we're driven by
8 a narrow application, that may have an impact on how the
9 SSCs get ranked.

10 CHAIRMAN JACKSON: That's right.

11 MR. THADANI: And so my view on this would be if
12 we go at it with the view that says we're going to really at
13 some point going to option 3, let's say, for the sake of
14 argument, then I think we ought to do as good a job as we
15 can up front to rank the SSCs so we can --

16 CHAIRMAN JACKSON: Well, isn't it the methodology
17 for ranking the SSCs?

18 MR. THADANI: That's the key.

19 CHAIRMAN JACKSON: Because the SSCs and how
20 important they are, you know, I've had the example of the
21 circ water pumps, right? You can have two in one plant and
22 six in another.

23 MR. THADANI: Yes.

24 CHAIRMAN JACKSON: And how important they are is
25 really a function of the design of the plant as well as

1 numbers and all that kind of thing.

2 MR. THADANI: Yes.

3 CHAIRMAN JACKSON: So we keep talking about a
4 scope of SSCs, but you've got BWRs, you've got PWRs, you've
5 got this vintage plant, you've got that vintage plant. So
6 there's no list for all time, there's an approach for
7 determining on a plant-specific basis what that list is. Is
8 that not correct?

9 MR. THADANI: Absolutely correct. Yes. Yes.

10 MR. KING: There's another aspect of choosing the
11 maintenance rule first, and that has to do with a point
12 Commissioner Merrifield brought up. There's a lot of
13 training and procedure rewriting and so forth that goes --
14 would take place as you start to change the scope of these
15 regulations, and a phased approach of implementation from a
16 practical standpoint might make sense. And I think what
17 we're saying here is the maintenance rule might make sense
18 as a first step in that phased approach.

19 COMMISSIONER McGAFFIGAN: I was just going to say
20 that the flip of that is if you're going to go through all
21 that training, you might as well have a higher payoff. If
22 you go through a plant and you say here are the systems,
23 structures, and components that are important for 50.65 and
24 we're now risk-informed 50.65, but by the way, here are the
25 systems, structures, and components that are important

1 elsewhere, and it's different, you've got a pretty confused
2 plant staff.
3 So, you know, I would think that there would be
4 certain efficiencies from the point of view of the plant to
5 go through the training once and not have two sets of books,
6 one for one rule and one for another.
7 CHAIRMAN JACKSON: Yes, I don't -- I mean a phased
8 implementation in a certain sense one understands, but you
9 can't have a scope for this one and a scope for that one and
10 a scope for this one. It's a methodology, and that
11 methodology should apply across the board. Otherwise, you
12 know -- I mean, that's part of what our problem is today.
13 You've got things that are important to safety and you've
14 got, you know, safety-related, and you go on down the line.
15 And that's what, if you're going to do this, go on and jump
16 off the cliff. Hopefully you've got a parachute.
17 COMMISSIONER McGAFFIGAN: Madam Chairman?
18 CHAIRMAN JACKSON: Yes.
19 COMMISSIONER McGAFFIGAN: My recollection of the
20 NEI rulemaking, I think the last meeting we had on this
21 subject was like late August or early September and we had
22 just heard about the 43 NEI rule changes. But most of those
23 were to change the scope everywhere and to use words like --
24 and somebody will correct me -- but it's, you know, systems,
25 structures, and components are important, are the ones that

1 either engineering judgment or risk analysis or something
2 else, operational experience have said are important, and
3 they were just going to put those words, proliferate them
4 all the way through Part 50 in the places they felt were
5 appropriate, and then you now have a consistent definition
6 all across Part 50.
7 I thought that was where you guys were headed
8 under Option 2 module of changes, but then you start talking
9 about going one by one, and it gets confusing, not just for
10 me, obviously. So what is the -- what does the rule change
11 look like when you're finished with Option 2?
12 MR. HOLAHAN: When you're finished -- I mean,
13 finished all of them -- I mean, it looks as you've described
14 it that a scope definition, not quite what NEI has
15 suggested, but something along those lines would apply to
16 all the regulations I think. The only distinction that the
17 paper suggests, and I don't think it's a crucial one, is
18 that presumably there will be more than one rulemaking
19 package --
20 COMMISSIONER McGAFFIGAN: Okay.
21 MR. HOLAHAN: With a consistent set of processes
22 and logic for, you know, what's risk-significant.
23 CHAIRMAN JACKSON: Not an omnibus rulemaking.
24 MR. HOLAHAN: Not an omnibus rulemaking, although
25 it, you know, I think that's simply a pragmatic issue.

1 There's no real policy or safety decision between the two,
2 it's just a matter of judgment as to which is the easiest
3 and fastest to get out.
4 CHAIRMAN JACKSON: What you don't want to end up
5 doing is to be stuck, you know, let me see if I can say this
6 in a kind way -- kind for us, Commission, as well as kind
7 for you and kind for the industry and kind for the
8 public-interest groups.
9 You know, there's a bit of history now, and this
10 is the new NRC, the new and improved, but there's a history
11 of things happening and taking, you know, having a degree of
12 interminability to them that, you know, even my young
13 colleagues here will have gone on to their greater rewards
14 and we will be, you know, part of the way -- I certainly
15 will be gone on to my greater reward -- we'll be part of the
16 way.
17 MR. HOLAHAN: If they're not done, we might all be
18 gone.
19 CHAIRMAN JACKSON: Well, you understand the point
20 I'm making, that in a certain sense you have an opportunity
21 when you have a Commission that is as like-minded as we are
22 to get it done. As they say, you step up, take it on, get
23 it done. But when you start down these piecemeal paths, you
24 run the risk of kind of getting stuck somewhere, and then
25 the Commission changes, some of you young bloods will have

1 changed, and then you do have this regulatory framework that
2 is in some kind of dissonance with itself. So that's just
3 my kind of statement.
4 All right, let's move on along.
5 MR. KING: The only other thing I want to say
6 about Option 2 is it's currently not in our budget or
7 operating plans, the activities.
8 CHAIRMAN JACKSON: Let me ask you this question.
9 Are there examples where SSCs may be out of scope for the
10 maintenance rule or 50.59 but in scope for the performance
11 assessment program or license renewal?
12 MR. KING: There could be. As you mention, the
13 methodology we would apply to select the SSCs ought to be
14 the same, but that may result in some different SSCs that
15 you'd look at and maintenance versus the QA program versus
16 seismic requirements and so forth or the inspection program.
17 So that's true.
18 CHAIRMAN JACKSON: Okay.
19 MR. KING: All right, slide 6 --
20 COMMISSIONER McGAFFIGAN: Commissioner, before you
21 get away from the passing reference to it not being in the
22 budget, the paper talks about, I just want to clarify this,
23 25 to 50 for Option 2, 25 to 50 NRR FTE over four to eight
24 years, NRR technical assistance, 250K per year, two to three
25 research FTE and 500K per year for approximately two to

1 three years.

2 First, is the 25 to 50 a total for the four to

3 eight years, or is it per year for the four to eight years?

4 Is it total, I hope? Okay.

5 CHAIRMAN JACKSON: So you can divide it by eight,

6 roughly.

7 COMMISSIONER McGAFFIGAN: Or four if we're fast.

8 CHAIRMAN JACKSON: Or four if you're fast.

9 COMMISSIONER McGAFFIGAN: So are we talking about

10 six to twelve FTE per year to do this rulemaking package and

11 then implement it? Is that the notion?

12 MR. COLLINS: Roughly, yes. There will probably

13 be a graded approach, but for talking purposes, yes.

14 COMMISSIONER McGAFFIGAN: Okay. And these are

15 budget-quality numbers here?

16 CHAIRMAN JACKSON: Give him time.

17 I'm going to help you with the Commissioner.

18 Build a good budget on this.

19 MR. COLLINS: This is the best-estimate process,

20 concurred in by the CFO. Given where we are, yes. Given

21 additional Commission direction, there may be some

22 modifications.

23 CHAIRMAN JACKSON: Right.

24 COMMISSIONER MERRIFIELD: Commissioner, it was a

25 very high-quality envelope.

1 CHAIRMAN JACKSON: It's a very high-quality way.
2 COMMISSIONER McGAFFIGAN: If we try to do it all
3 at once, I mean the omnibus rulemaking, presumably that has
4 lots of stuff in the statements of consideration as to why
5 we felt the scope change was appropriate in this rule, that
6 rule, and the other rule, but would that require more
7 resources? You said you'd had discussions internally
8 about -- and making a practical judgment about doing it all
9 at once as I think we're questioning or doing it in a series
10 of steps that sets up some of these implementation issues
11 that we've been concerned about, but how much more resources
12 would you need if you try to do it in one -- Option 2 as one
13 omnibus scope change and a variety of regulations?
14 CHAIRMAN JACKSON: Gary?
15 MR. HOLAHAN: I don't think we really know. I
16 mean, this estimate -- it's not like we had two estimates,
17 one for, you know, four rule changes in a row and one for
18 one. And probably the range -- the ranges you see here may
19 be large enough to cover the differences.
20 COMMISSIONER McGAFFIGAN: Okay.
21 CHAIRMAN JACKSON: Um-hum.
22 MR. KING: Okay. Slide 6 discusses Option 3, and
23 Option 3 was developed assuming you implemented Option 2 and
24 Option 3 built upon it. And it's the option that actually
25 gets into the technical requirements in the rules and we get

1 into design issues. And there are several alternatives that
2 could be used under Option 3.
3 One would be to just allow licensees, put some
4 words in the rules that would allow licensees to propose
5 acceptable alternatives to the current rules. Another would
6 be to actually go in and modify the rules themselves,
7 whether that's changing the definition of the design basis
8 accidents or the acceptance criteria or the conservatisms
9 that need to be assumed remains to be seen. And then also
10 as part of that we'd look at the leading regulations with
11 little safety significance. Again, the NEI whole-plant
12 study we feel would be very amenable to being a good pilot
13 for this activity, but recognizing that this activity is a
14 very complex process, we do feel it needs some additional
15 study, and therefore that's what we've recommended at this
16 point in time.
17 And to come back to your question, Chairman
18 Jackson, the options versus the objectives of the
19 rulemaking, I think Option 1 achieves a little bit of the
20 first objective, to enhance safety decisions, because it
21 does do that in a couple of selected areas. I think Option
22 2 is a step toward meeting all three objectives, and Option
23 3 is really the full nine yards in trying to meet all three
24 objectives. So that's the way I would characterize it.
25 CHAIRMAN JACKSON: Okay. Let me ask you a

1 question and perhaps offer you a way out of it. You know,
2 my question was that you make a statement that with respect
3 to public confidence that the staff concluded that Options 2
4 and 3 would represent high or moderate-to-high improved
5 public confidence. So my question was, what measures did
6 you use to reach these conclusions? And was it based on
7 some analysis that talked about the extent to which the
8 options allowed you -- that's the way -- you know, the
9 escape path. To the extent to which these objectives were
10 being --
11 MR. KING: It's not based on an analysis or a
12 survey. It's based upon a subjective judgment, and the
13 judgment is based on the fact that, you know, we've been
14 criticized for being inconsistent and incoherent in the
15 past, and anything that takes us along the direction of
16 having a more logical, consistent, coherent regulatory
17 process that results in better decision making is going to
18 be a step toward improving public confidence.
19 CHAIRMAN JACKSON: Okay. But what you didn't do
20 was to take the options and just overlay them with the
21 objectives you started out with, and see to what extent the
22 options met those objectives, and use that as the basis for
23 deciding that you'd have high or low or moderate-to-high.
24 MR. HOLAHAN: I think to a large extent we did
25 that, and the table in Attachment 3 to the paper effectively

1 lays out those objectives and judgments against them.

2 CHAIRMAN JACKSON: It's real good. You got me

3 that time.

4 COMMISSIONER McGAFFIGAN: One could point out that

5 it's not a perfect mapping of effectiveness. We've avoided

6 perfection successfully.

7 CHAIRMAN JACKSON: Right. But you would not be

8 letting perfection be the enemy of the good.

9 MR. KING: Okay. Finally on Part 50 is slide 7,

10 which lists the four policy issues that the paper contains

11 that we're seeking Commission guidance upon.

12 The voluntary-versus-mandatory issue in terms

13 which would apply to either Option 2 or 3, where the staff

14 is recommending it be voluntary, but in conjunction with

15 that recommending that if a plant volunteers to go the

16 risk-informed route, that they take the entire set of

17 risk-informed requirements that are under Option 2 or 3, no

18 cherry picking. And we discussed that earlier.

19 Exemptions for pilot plants. We think pilot

20 plants are a very key activity to end up with a good

21 rulemaking, and if we can do that through the exemption

22 process to really test out these rules, we think that's a

23 preferable way to go, and we're recommending to the

24 Commission that we allow the use of pilots and the use of

25 exemptions in those pilots.

1 Modification to the maintenance rule scope. We
2 have a near-term rulemaking on the maintenance rule, which
3 we are proposing to continue as planned. That is, we talked
4 about earlier that we come back in and use the maintenance
5 rule as a first step in testing out the risk-informed scope
6 under Option 2.
7 And finally requesting Commission direction
8 regarding developing additional clarification of staff
9 authority to use risk-informed decision making, and that
10 would be particularly in cases where licensees are not using
11 these risk-informed options.
12 Now in summary on Part 50 we're talking about --
13 yes.
14 CHAIRMAN JACKSON: Go ahead. Go ahead.
15 COMMISSIONER DICUS: I want to go back up to this
16 exemptions for pilot plants. I think in SECY-98-300 South
17 Texas was the example where in their graded QA pilot project
18 some issues arose that this was the best way to deal with,
19 and I think my question goes to the point that if -- have
20 you looked at our other risk-informed initiatives and found
21 similar problems? And if so, what you might be doing about
22 them?
23 MR. HOLAHAN: My recollection is the South Texas
24 example was the only one where we saw this kind of
25 interrelationship among requirements, that that

1 substantially limited their ability to implement the program
2 that they wanted.
3 I think the other initiatives, in-service
4 inspection, in-service testing, and tech spec changes were I
5 think sufficiently isolated that these sort of problems
6 didn't arise.
7 MR. THADANI: I would also expect that graded QA
8 by its very nature is programmatic and goes into other
9 things.
10 COMMISSIONER DICUS: So you don't see this as just
11 something you may run into all the time and a problem that
12 is going to have to be dealt with constantly or there is
13 going to be a plant here or maybe a plant there or a program
14 here or a program there?
15 MR. HOLAHAN: In large part, our desire to avoid
16 what we call cherry picking is because it gets you into
17 these sort of situations. If you don't have a consistent,
18 logical set of scope requirements for purchasing pumps and
19 maintaining them, then you are likely to get into these
20 difficulties.
21 MR. THADANI: As I sit here and think about your
22 question, I think there may be some places that it could
23 crop up. ISD, seismic issues. If there is a tie-in through
24 code requirements, there is a potential there, it seems to
25 me; environmental qualification. There may be some

1 potential issues there.

2 As I think about this, I'm not so sure that it

3 wouldn't come up again.

4 MR. HOLAHAN: We have one that we are living with

5 now. The maintenance rule and technical specifications

6 don't always tell licensees to do the same treatment of

7 equipment. There are even circumstances where a maintenance

8 rule may call for a licensee to make sure that equipment is

9 kept in service even though the technical specifications may

10 allow it to be taken out. That sort of situation will also

11 be dealt with better in risk informing the regulations with

12 a comments scope.

13 CHAIRMAN JACKSON: If in fact you have a situation

14 where there is this dissonance between what the tech specs

15 say and what the rule allows, what are you going to do about

16 it?

17 MR. HOLAHAN: Right now we have to follow both or

18 the more limiting of the two, because they are required to

19 meet both regulations.

20 MR. COLLINS: These incontinuities in the

21 regulatory fabric where you have a program like South Texas

22 had that in order to derive the maximum benefits -- I call

23 benefits the balance of safety integrated approach to the

24 equipment itself -- you run into these inconsistencies. It

25 speaks to having a contiguous program as far as risk is

1 concerned. In the aggregate, the agency has piecemeal, so
2 to speak, different treatment of equipment.
3 EQ is probably one of the best examples that South
4 Texas has run into. It doesn't lend itself towards a
5 consistent application of risk and then deriving the
6 benefits of that because of the regulatory nexus of how you
7 have to treat that equipment. I think that speaks to
8 decisions that have to be made in this paper towards the
9 options.
10 I agree with Ashok. I think the more we implement
11 these programs the more we will learn, perhaps, in the
12 application of those and in the derived benefits that are
13 yet unforeseen for some of these policies we will run into
14 those inconsistencies.
15 COMMISSIONER McGAFFIGAN: Does the quality of PRA
16 issue come into option 2? We have talked in previous
17 meetings about needing a higher quality PRA for more complex
18 situations. If option 2, the omnibus rulemaking where you
19 change it in a whole bunch of places, that sounds like a
20 complex situation. So the quality of PRA issue would come
21 out.
22 Then if it does come out, how do you implement
23 option 2 in fact? Does somebody come with a licensing
24 amendment saying "I would like to move to option B," name
25 the 12 regulations that are tied together, and then we'd

1 make a judgment at that point as to whether they could
2 transition to option B of the 12 regulations and that's
3 where the quality of PRA judgment would come in? How does
4 it work?
5 MR. THADANI: The quality of PRA has to come in
6 almost every application that you make. Even under option 1
7 there is always the issue of quality of PRA. What we said
8 in Reg Guide 1.174 was that there will be cases where
9 simpler analyses would be adequate because we felt the
10 impact on risk would be minimal; there was no real question
11 or uncertainties and so on.
12 As you get into applying in a broader way
13 environmental qualification or some significant areas, that
14 raises a question about the total PRA. Not a piece of it,
15 but the overall PRA. The quality is a fundamental issue.
16 We pointed out that is one of the more challenging
17 implementation issues. You will hear later on about where
18 we are in terms of the standard as well as the peer reviews
19 and the certification issue, but I think quality has to be a
20 key element.
21 CHAIRMAN JACKSON: For the Commission's
22 edification, what fundamentally determines the quality of a
23 PRA?
24 MR. THADANI: I would think that proper
25 consideration of data; proper consideration of the scope of

1 the analyses: Does it include internal events? Does it
2 include external events? Does it include shutdown
3 conditions? There is the issue of scope. Then there is the
4 issue of where we can quantify uncertainties and where we
5 know we don't know how to quantify uncertainties. How would
6 we deal with those? That is why the whole issue of defense
7 in depth is very critical as one goes forward to really
8 clarify the role of risk assessment and the role of other
9 attributes.
10 You might recall we describe what we call five
11 basic principles that we would apply. One of those would be
12 the quality of risk assessment. We recognize up front that
13 there are limitations in the technology. Those enhancements
14 have to be made. It's going to take a while, but that
15 doesn't mean that we just wait until we get a perfect risk
16 assessment. What other factors we will consider is going to
17 be an important element.
18 CHAIRMAN JACKSON: I want the Commissioner to
19 finish his question, but I want to flesh that out relative
20 to this quality issue.
21 COMMISSIONER McGAFFIGAN: One of the things that
22 strikes me all the time is we are always dealing with the
23 folks who have made major investments in PRA and all these
24 pilot studies. So you are dealing with the higher quality
25 end of the spectrum.

1 To go back to my question about how it would work
2 in fact, let's say it's four years from now. We have done
3 it in the four-year rather than the eight-year time frame.
4 It's January of 2003. I'm now a licensee and I want to now
5 go to option B. Let's say it's 12 different rules.
6 Do I apply for a license amendment saying that six
7 months from now I would like to transfer to option B and you
8 guys approve it and part of the approval process is
9 consideration of is this entity up to transitioning to
10 option B? Is it automatic that they can go to option B if
11 they so choose and they just give us an information note
12 saying we now consider ourselves under option B? How does
13 it work in practice?
14 MR. HOLAHAN: We have not developed that level of
15 detail as to what level of staff review and approval would
16 be involved. I think what we do know is in the pilot stage
17 for plants with exemptions, any sort of test cases, it would
18 clearly require staff review and approval of probably both
19 the PRA and how it's being used.
20 If you look at the objectives that we are trying
21 to achieve, it seems to me in the long run this ought to be
22 a process in which licensees are implementing it on their
23 own subject to an NRC inspection type oversight. I don't
24 think from an efficiency point of view we want to be in a
25 review and approval mode on every plant, every issue.

1 Whether there would be a sort of one-time ticket to get in
2 the ball game, we haven't thought through that process. It
3 seems to me it could be done either way.
4 MR. KING: It's one of the implementation issues
5 you see in the back of the paper.
6 CHAIRMAN JACKSON: Actually, there is kind of a
7 cat chasing its tail issue. Today you could argue that
8 because we allow license amendments based on considering
9 information coming from a risk assessment PRAs, that is one
10 part of the circle. The question I have is, to what extent
11 does the quality of the PRA rest with how well you know the
12 licensing basis of the plant?
13 MR. HOLAHAN: I don't think it relates to the
14 licensing basis; it relates very fundamentally to how well
15 you understand the plant. PRA is fundamentally a logic
16 model. To understand the logic means to understand how all
17 the systems interrelate and how they react to various
18 circumstances. The licensing and design basis, the very
19 stylized --
20 CHAIRMAN JACKSON: I guess I mean the as-built
21 plant.
22 MR. HOLAHAN: It means a fundamental understanding
23 of the as-built plant. Absolutely.
24 CHAIRMAN JACKSON: Then the second part has to do
25 with this issue of the quality of the data. There are

1 questions that relate to industry-wide or industry average
2 data versus plant-specific data. If you want to make a
3 judgment relative to a given plant, then how much are you
4 hamstrung by what you know about the various assumptions
5 that go into a PRA relative to that specific plant?
6 MR. THADANI: When I said there were voids in
7 knowledge, if documentation says one thing and the actual
8 as-built condition is different, it's very unlikely that the
9 conduct of PRA will identify that problem. There is some
10 chance, because sometimes before conducting certain parts of
11 risk assessment licensees would have multidisciplinary teams
12 walk down some areas. That could identify some potential
13 problems.
14 In general, PRA would not identify things like
15 design errors and things of that nature. That has to be
16 recognized.
17 In terms of the data, there is a variation in
18 terms of data. If one doesn't have enough data on a
19 plant-specific basis, one can use a pool of data, and then
20 there are techniques to utilize the limited plant-specific
21 information to modify the models for the use of generic
22 data. Those techniques have been known for quite a long
23 time. I don't believe there is any uniqueness in the sense
24 of using generic data complemented with the plant-specific
25 to see if any changes need to be made to things like failure

1 rates and so on. I don't see that as a big problem.

2 MR. HOLAHAN: I think it's very important in these

3 topics to understand that we are not talking about a

4 risk-based approach and that we are not relying entirely

5 upon the PRA, its insights or its numbers to derive what is

6 important and what is not. This is still a risk-informed

7 approach.

8 In some areas where the PRA may not be

9 particularly strong, so long as that is understood, then

10 design basis information can be used to supplement that

11 situation. So what is really important is to know the

12 strengths and weaknesses of the PRA, to draw the best and

13 most valuable information out of the PRA, and valuable

14 information out of the design basis in making these

15 decisions. In part that deals with the PRA quality issue as

16 well.

17 MR. THADANI: Again, I go back to Commission

18 endorsed issuance of Reg Guide 1.174. That reg guide very

19 clearly articulates those concerns and issues. That is why

20 I go back and say there were five basic considerations,

21 quantification of results being one of those considerations.

22 CHAIRMAN JACKSON: Let me ask you kind of a

23 different question. This has to do with the maintenance

24 rule. NEI -- I'm sure they are going to talk to us about it

25 -- has indicated some concerns with the introduction of new

1 terminology into the body of the proposed maintenance rule.
2 For example, "risk-significant configuration" and "degrade
3 performance to an unacceptable level." What progress have
4 you made in clarifying this terminology?
5 MR. HOLAHAN: I've seen those concerns and I've
6 been at some of the meetings where those concerns have been
7 expressed. The staff is looking at those concerns. It is
8 developing some alternative words for the rule or for
9 guidance documents. I think those are still in the
10 developmental process. There have been some discussions.
11 We are not at the end of that process, but I think we are
12 dealing with the issue.
13 CHAIRMAN JACKSON: Sam.
14 MR. COLLINS: To come back to the philosophical
15 issue of the unintended consequences of those proposed
16 words, I think it is important and the staff agrees with the
17 industry that there can be unintended consequences based on
18 individual licensees and perhaps even some unintended
19 confusion by our inspectors without adequate guidance to
20 accompany those words.
21 So the question becomes, is there a way to achieve
22 the goal without those unintended consequences? I think the
23 answer to that is yes. We have some alternative wording
24 that has been expressed by the staff. It is under review.
25 I think we can get there. But we do agree with the industry

1 on the goal.

2 COMMISSIONER MERRIFIELD: In terms of the issue of
3 the scope of the maintenance rule, it's my understanding
4 that the staff has raised an issue that there may be some
5 impact on the implementation of license renewals under Part
6 54. I was wondering if you could comment on that briefly.

7 MR. HOLAHAN: I think licensees can and in the
8 case of the current applicants are using the maintenance
9 rule as part of their basis for how the plant is managing
10 aging. If the scope of the maintenance rule is changed, the
11 licensees still need to address those issues. They might in
12 part have to use other means, other parts of the licensing
13 basis, or in fact they might have to construct a separate
14 additional program to address passive aging issues. It's
15 not a crippling issue for the concept of risk informing the
16 maintenance rule, but I think it might change the strategy
17 that an individual licensee takes for license renewal.

18 COMMISSIONER MERRIFIELD: To what extent is that
19 going to complicate the license renewal process?

20 MR. HOLAHAN: Since there is a substantive review
21 and approval process, I think the time and the forum are
22 available to deal with those sorts of issues. The licensee
23 will propose how they are going to deal with these issues.
24 If it's other than the maintenance rule, they will have an
25 opportunity to submit that to the staff. On the docket and

1 in meetings there is plenty of opportunity to understand how
2 they would deal with it without a maintenance rule.
3 CHAIRMAN JACKSON: I noted that your SECY paper
4 indicated that you felt that the potential impact of option
5 3 on Part 52 should be considered. Can you say what the
6 issue or issues were the staff was trying to identify with
7 respect to Part 52 and future reactors?
8 MR. HOLAHAN: I don't think there was a specific
9 list or a specific problem in part 52. I think it was the
10 general concept that improvements that could be made to part
11 50 and focusing them better on safety issues, that general
12 concept applied to Part 52 as well, and that there are
13 similar words in Part 52 and similar concepts that ought to
14 be made consistent. I don't believe that any of the design
15 certifications that have already been approved would
16 necessarily be changed.
17 CHAIRMAN JACKSON: But you haven't done that
18 analysis?
19 MR. HOLAHAN: We have not done that analysis.
20 MR. TRAVERS: Part 52 requires a PRA. So these
21 reactor designs were based in part on the insights obtained
22 from the required PRA development insights. I think that is
23 one reason why we are fairly confident that it wouldn't have
24 --
25 MR. THADANI: Right. That's the key. Part 52 is

1 basically a process type rule. The real substance really is
2 in Part 50.
3 CHAIRMAN JACKSON: You raised the issue.
4 MR. THADANI: It's just a completeness issue. I
5 don't think there would be much of an issue there.
6 CHAIRMAN JACKSON: Well, you raised it. Let's
7 move along.
8 MR. KING: Just to wrap up Part 50, what you have
9 in front of you in SECY-98-300 is a paper that presents some
10 high level options, some high level issues that we need some
11 direction on, and once we get your direction, we will be
12 able to proceed and develop a more detailed rulemaking plan,
13 look at resources in a more realistic fashion and deal with
14 these implementation issues.
15 With that, I will turn it over to Gary.
16 MR. HOLAHAN: In light of the time, I will try to
17 go quickly through recent progress.
18 CHAIRMAN JACKSON: You have two minutes.
19 [Laughter.]
20 CHAIRMAN JACKSON: All right. Four minutes.
21 MR. HOLAHAN: Thank you.
22 In fact, most of the information presented here is
23 also in the staff's response to the tasking memo. These are
24 sort of the things that we track on a month by month basis.
25 There have been a number of successes in the

1 in-service inspection program.

2 The Westinghouse Owners Group topical report was

3 approved last month.

4 The staff is working on the EPRI methodology.

5 They responded to our questions in November and we are

6 meeting with them next month, and I believe that we will see

7 a successful completion of that review sometime in the

8 middle of this year.

9 Safety evaluation reports have been issued

10 approving the Vermont Yankee, Surry and Arkansas programs.

11 I think the important thing to recognize is

12 in-service inspection is one of the high priority programs

13 for licensees. That's because it's something that is done

14 during outages. Any of the programs that affect outage

15 length are the programs that have major costs associated

16 with them.

17 In-service testing program. We approved the

18 Comanche Peak program. I quoted a number of changes in the

19 treatment of valves earlier.

20 We've had some mixed experience in this program.

21 It's clearly not the large safety and economic changes that

22 we have seen in the in-service inspection program.

23 The Palo Verde plant had considered being a

24 follow-on, a second pilot to Comanche Peak. They have

25 withdrawn that since they want to focus their risk

1 activities in other areas.

2 San Onofre has indicated that they are interested

3 not in a total in-service inspection program change but

4 changes in selected areas. In fact, that may be more of the

5 direction for this program, where selected changes are

6 envisioned.

7 COMMISSIONER McGAFFIGAN: Could I ask one

8 question. It's a process question. Last Tuesday morning

9 Nuclear News Flashes mentioned that there was going to be a

10 meeting that day on how to do in-service inspection more

11 broadly, working on the Surry and the Westinghouse Owners

12 Group report, getting approved, and it said the meeting

13 hadn't been on the web page, et cetera. I looked at the web

14 page that day. It was on the web page by Tuesday. Did

15 anybody have a chance to look at that complaint as to

16 whether that meeting between the staff and the industry was

17 properly noticed? I'm pretty sure it was last Tuesday.

18 MR. COLLINS: We looked at that. The answer is it

19 was properly noticed. There was a meeting notice that was

20 put on in mid-December, as I recall.

21 COMMISSIONER McGAFFIGAN: It wasn't mid-December.

22 MR. COLLINS: A hard copy of the meeting notice,

23 which is our guidance. This is all staff guidance.

24 The meeting notice guidance goal is ten days,

25 although we have the ability to do it on an expedited basis

1 if necessary. There are follow-on activities, however,
2 including the toll-free number for call in. We put out a
3 consolidated list of meeting notices and make that
4 available; we put the hard copy in the PDR; and then we have
5 a web page. All of those are meant to be somewhat
6 redundant.
7 The web page is an enhancement to our normal
8 process. Clearly we have some implementation issues to work
9 through there. In this particular case we had difficulty in
10 getting the hard copy to the people who put it on the web
11 site within the normal amount of time, although eventually
12 it did end up there and it was caught by the project
13 manager, I believe, at the last minute.
14 As early as today I met with the admin staff and
15 our program staff in NRR. We will be working with the CIO
16 to try to refine that process in its EDO initiative to
17 update the management directive.
18 We are almost at a point in our effort where we
19 have processes that are almost too complicated and
20 redundant. So I think we have to take a look at those. The
21 web is the easiest but the hard copy is the staff guidance
22 or requirement.
23 COMMISSIONER McGAFFIGAN: The specific complaint
24 was on the web page. By the time I looked at it the day of
25 the meeting it was on the public web page, not just the

1 internal web page, but maybe it wasn't on for the sufficient
2 period of time or whatever.
3 MR. COLLINS: I think that's the case. Clearly
4 the PDR, which used to be the only tool, is now not as
5 convenient as some of the supplemental tools we have. So we
6 need to look at the priorities of which one do we want to
7 maintain given the level of effort.
8 CHAIRMAN JACKSON: I just think there is an
9 opportunity, and you've already said it, to conform whatever
10 your guidance is about noticing meetings to the electronic
11 opportunities, which is what I think the Commissioner is
12 concerned about.
13 Why don't we move along.
14 MR. HOLAHAN: Viewgraph number nine.
15 In terms of the graded QA program, we approved the
16 South Texas program in November of 1997. I think that was a
17 success conceptually. It identified that improvements can
18 be made. What South Texas found in the process of
19 implementation was that there were some limitations on how
20 far they could go with the graded QA program, and we have
21 been using that experience as part of developing the
22 thoughts for risk informing Part 50. So we already know
23 that those issues would be addressed by option 2 or option
24 3.
25 CHAIRMAN JACKSON: Either because the Commission

1 decides the policy issue in the absence of full risk
2 informing Part 50 or part 50 is risk informed; is that what
3 you are saying?
4 MR. HOLAHAN: Either a voluntary or a mandatory
5 option 2 would allow a licensee to address those issues,
6 yes.
7 Viewgraph ten, please.
8 Grade QA inspection procedures are under
9 development. There have been discussions with the CRGR.
10 Those were developed while South Texas was implementing
11 their program. So we used that as a pilot activity. This
12 is a little behind schedule, but I think that experience is
13 working reasonably well.
14 There are a couple of other licensees who have
15 indicated an interest in graded QA. I think they are
16 waiting for the South Texas experience to sort out for a bit
17 before they move ahead with their programs.
18 CHAIRMAN JACKSON: How does this draft graded QA
19 inspection procedure and its management review play into or
20 derive from the risk-informed baseline inspection program?
21 MR. COLLINS: They were created separately. I
22 think the philosophy should be consistent, Chairman, but the
23 tracks that they were on when they were initially developed
24 were separate. We didn't have the opportunity to overlap
25 those, although there is some commonality in the people.

1 The shortcoming in the procedure itself is a lessons learned
2 for the oversight process.
3 CHAIRMAN JACKSON: What I'm trying to say is if
4 you are going to the trouble of doing a risk-informed
5 baseline inspection program and you have this graded QA that
6 has come out of a risk-informed initiative, that goes back
7 to my first question I was asking you at the beginning of
8 this briefing, which is how are you going to ensure that you
9 aren't doing these duplicative things, first of all, and
10 secondly, that if you they are duplicative that they may in
11 fact have something that is somewhat different? How are you
12 going to have a draft graded QA procedure out of a
13 risk-informed pilot initiative that is somehow not exactly
14 tied in with the risk-informed baseline inspection program?
15 MR. COLLINS: As we develop the scope, which is
16 the next phase of the oversight process, we will determine
17 whether this is a target for review either by the industry
18 or by the agency. Then the guidelines will be developed for
19 the content of those procedures. This would be folded in
20 along with other similar procedures that are currently under
21 way. This is a little bit ahead of that effort.
22 CHAIRMAN JACKSON: Again, it's not unlike the long
23 discussion we've just had about doing things in a piecemeal
24 way vice doing the comprehensive approach.
25 MR. COLLINS: Yes.

1 CHAIRMAN JACKSON: Okay.

2 MR. HOLAHAN: In terms of technical

3 specifications, this is an area where there has been a

4 rather large number of activities completed over the last

5 several months.

6 Five topical reports from the CE owners group and

7 one from the Westinghouse Owners Group were approved.

8 Individual plant extensions of allowed outage

9 times have been done for about ten units with diesel

10 generator changes and about 14 units getting changes in the

11 ECCS allowable outage times. So there is substantial

12 interest and activity in that area.

13 Next viewgraph.

14 Another activity we've been involved with using

15 risk information recently is reducing requirements for the

16 BWR vessel shell welds. In effect, the staff has agreed and

17 has put out guidance to licensees that would effectively

18 reduce the vessel weld inspection by about half. We've

19 identified that the circumferential welds and the axial

20 welds can be treated basically separately in the process. I

21 think that will be a substantial savings to the BWR

22 licensees, because it again is the kind of activity that has

23 a substantial effect on outage length.

24 CHAIRMAN JACKSON: Let me ask this question. Did

25 the BWR study that justified the vessel weld inspection

1 proposal and the changes also point out vulnerabilities due
2 to cold overpressure conditions?
3 MR. HOLAHAN: I wouldn't choose the word
4 "vulnerability," but I think it identified a significant
5 issue with respect to cold overpressurization. The staff
6 identified that issue. It was included in the evaluation
7 that went to the Commission and the licensees. The BWR
8 owners group has agreed to address that issue. They have
9 given us some information on the subject.
10 CHAIRMAN JACKSON: So what are we doing about it?
11 MR. HOLAHAN: There is a meeting. I don't
12 remember the date. I think the staff and the licensees have
13 recognized the issue.
14 MR. COLLINS: Dr. Sheron can address that issue.
15 CHAIRMAN JACKSON: Thanks.
16 MR. SHERON: The evaluation showed that the
17 original numbers that were submitted by the BWR owners,
18 which were very, very small if you remember, when we asked
19 them to look at the cold overpressurization brought the
20 number substantially up, but they were still small enough
21 that we could from a risk standpoint allow the elimination
22 of the circumferential weld inspections.
23 For the vertical welds the numbers were not that
24 small. However, we thought the analysis was conservative in
25 the sense that they were only looking at welds that were in

1 the worst location from the standpoint of flux and so forth.
2 So we have asked the owners group to go back and readdress
3 the vertical welds and to do further analyses and refine
4 their numbers and see what the final answer is. That is
5 where that stands right now.
6 CHAIRMAN JACKSON: Thank you.
7 MR. HOLAHAN: With respect to the NEI whole plant
8 study, task zero was some initial licensing activities.
9 There were three cases to be submitted. Two of them have
10 already been submitted to the staff, one on hydrogen
11 monitoring, which staff has approved through the issuance of
12 a confirmatory order.
13 The staff went on to send a copy of that order to
14 all the licensees and to ask which other licensees would be
15 interested in following on that subject. To date two or
16 three licensees have indicated that they are also interested
17 in that sort of relief. So we will go ahead and process
18 those shortly.
19 The second item on the task zero was the San
20 Onofre request effectively to remove the requirements for
21 hydrogen recombination. That issue was submitted back in
22 September. It's actively under staff review. Staff is
23 looking at some analyses of severe accidents to determine
24 the value of hydrogen recombination for some realistic
25 severe accident scenarios.

1 We expect shortly to meet with the San Onofre
2 licensee and hopefully complete that evaluation by the
3 middle of this year.
4 I think it's important to understand that we are
5 trying to make judgments in this case which are not just
6 specific to this plant, but it would form the basis either
7 for exemptions or more likely for a rule change. Hydrogen
8 recombination is currently a requirement of the regulations,
9 and if we find that isn't necessary or is necessary in less
10 rigorous fashion, I think this issue really applies to all
11 large dry containments.
12 The suggested third task, which has to do with
13 start time for diesel generators, has not been submitted.
14 South Texas, our last information is they are still
15 considering whether to submit that or not as part of their
16 overall plans.
17 Viewgraph 12, please.
18 The issue of PRA quality was raised earlier. I
19 think Tom and Ashok mentioned that progress is being made on
20 the ASME standard.
21 CHAIRMAN JACKSON: When do you expect that to be
22 completed?
23 MR. HOLAHAN: Tom.
24 MR. KING: The final meeting of the writing group
25 is taking place today. We expect that they will release it

1 for public comment later this month; approximately 60-day
2 public comment period. When it comes back, any changes are
3 made. It goes through the ASME approval process. We expect
4 it to be out final in June of this year. That is phase I.
5 That's the internal events level 1 full power operation. We
6 are going to embark on phase II, which picks up the other
7 pieces.
8 COMMISSIONER McGAFFIGAN: Can we ask when phase II
9 is going to be completed?
10 MR. KING: I would estimate it would take about a
11 year.
12 CHAIRMAN JACKSON: Okay.
13 MR. HOLAHAN: Viewgraph 13.
14 There are a number of staff guidance and training
15 issues that are going on to try to put consistency and
16 quality in the activities we are undertaking.
17 The PRA steering committee which was mentioned
18 earlier has met a number of times both with the staff and
19 with the corresponding group in industry.
20 We formed a risk-informed licensing panel which
21 has met numerous times in dealing with licensing type
22 issues.
23 A number of implementation guidance documents have
24 been put out. We put out some additional guidance to the
25 staff on how to deal with licensing activities.

1 There has been continuation of the staff training
2 program. There are training courses for managers, for
3 reviewers and for inspectors. All of those are continuing.
4 In addition to that, as part of the response to
5 the tasking memo we've established a communications plan for
6 all of the risk-informed activities. So we are working
7 through that process as well.
8 CHAIRMAN JACKSON: The only comment I would make
9 is that from what I'm hearing the staff training and the
10 communications part needs to be elevated on your list.
11 MR. TRAVERS: Fundamentally, that completes our
12 presentation.
13 COMMISSIONER MERRIFIELD: I've got one last
14 question.
15 CHAIRMAN JACKSON: Yes.
16 COMMISSIONER MERRIFIELD: Going to the issue of
17 PRAs, we have a presentation that Mr. Lochbaum is going to
18 be making. He raised a question in his written testimony.
19 I was wondering if you could respond to it. He states that
20 plant-specific risk assessments are flawed because you have
21 outcomes with virtually identical nuclear power plants that
22 have widely disparate risk profiles and you need different
23 assumptions and level of detail in those. I was wondering
24 if you could comment on that and give us your response.
25 MR. THADANI: In fact, a very important element of

1 risk assessment is to understand this is a very unique tool
2 that brings design and operational aspects together in an
3 integrated fashion. You can have similarly designed plants
4 with different results because some licensees may choose on
5 their own initiative to do more than minimally required, or
6 they have much better operational experience. An issue came
7 up earlier about how you use plant-specific data, for
8 example. It may be much better than the generic or sister
9 plant data.
10 Those kinds of variabilities in fact, in my view,
11 would be there almost all the time because of some of these
12 factors. In this country I don't believe there are really
13 any two plants which are alike. When you look at what we
14 mean by Westinghouse designed plants, that is just the part
15 of the plant that is designed by Westinghouse. There is the
16 architect-engineer. There is a larger number of --
17 CHAIRMAN JACKSON: What's the bottom line?
18 MR. THADANI: The bottom line is that I would
19 expect differences, and those kinds of things are in fact
20 addressed as part of the risk assessment. One would expect
21 to see those differences.
22 COMMISSIONER MERRIFIELD: But the fact that there
23 are differences isn't necessarily a concern?
24 MR. THADANI: Absolutely not.
25 CHAIRMAN JACKSON: Okay.

1 For the record, I want to indicate that
2 Commissioner Diaz did raise a question. I think we have
3 addressed much of it, but I would like to read it.
4 He says, assuming that voluntary conformance is
5 established for risk-informed regulatory activities, has the
6 staff determined the usefulness and effectiveness of a few
7 risk-informed rules and regulations, that is, 50.59 and the
8 maintenance rule versus a plan that phases in a
9 risk-informed Part 50? Essential to the success of such a
10 plan would be to establish the hierarchy of pertinent rules
11 and regulations.
12 Any commentary?
13 MR. KING: I think the options we have laid out
14 are consistent with the feedback we have gotten from
15 industry regarding what are the ones that received the
16 biggest safety payoff as well as unnecessary burden
17 reduction which deals with those rules that we call special
18 treatment. That is the way we have laid out the sequence,
19 to hit those first and then go into the others.
20 CHAIRMAN JACKSON: Okay. Thank you very much.
21 Let's hear from NEI.
22 Good afternoon. Mr. Beedle, Mr. Floyd and Mr.
23 Pietrangelo. Happy New Year.
24 MR. BEEDLE: Happy New Year to you.
25 I think the audio system has achieved day one

1 status in the maintenance rule.

2 CHAIRMAN JACKSON: Yes. I think you're right.

3 MR. BEEDLE: We'd like to talk about two issues

4 relative to the discussion that you've just completed. Not

5 to belabor the points, but we would like to talk a little

6 bit about the rulemaking under risk-informed regulation and

7 also talk about the maintenance rule. Steve Floyd is going

8 to talk about the risk-informed rulemaking.

9 Steve.

10 MR. FLOYD: Thank you, Ralph.

11 Chairman and Commissioners, we do have a few

12 general remarks to make about the proposed SECY paper.

13 First of all, we are in, I would say, substantial agreement

14 with the NRC staff's suggested approach. We think option 2

15 with option 3 as a follow-on is a logical sequence to

16 pursue.

17 I'd like to emphasize a point that I think Mr.

18 Holahan made. This is not a risk-based approach; it truly

19 is a risk-informed approach; and we are in total agreement

20 with that. We know that there is some concern about whether

21 or not the actual plant as-built is reflected accurately in

22 the PRA models.

23 That is a legitimate concern, but I would point

24 out that that concern also exists today with the

25 deterministic set of analyses and deterministic set of rules

1 that we have. To the extent that the plant has been
2 licensed and has been judged to be able to respond to
3 certain events is also highly dependent upon whether or not
4 the as-built plant meets what those deterministic
5 requirements were. So I think you have the same problem
6 with basically the same result occurring. So it's important
7 whether you use a deterministic approach or a risk-based
8 approach.
9 CHAIRMAN JACKSON: Risk-informed.
10 MR. FLOYD: Risk-informed. Excuse me. I just
11 violated my own rule here.
12 We do believe that it is appropriate to
13 concentrate on the scope issues. First, we think that would
14 allow for the maximum closure, if you will, and consistency
15 between what is being developed under the assessment process
16 and the move to make Part 50 more risk-informed.
17 COMMISSIONER McGAFFIGAN: On that point, do you
18 have an opinion about -- I will use an analogy -- if there
19 are 12 rules that have the scope change whether that happens
20 all at once or in a series of rulemakings?
21 MR. FLOYD: Yes, sir. We think there is and
22 should be one definition for what constitutes the scope of
23 SSEs to which the body of regulations apply. However, we
24 do, for implementation reasons, mostly resource constraints,
25 see the need to have some phasing, but we really don't see a

1 multiple phasing.

2 We see two approaches. One is to test out the

3 overall concepts under the maintenance rule because that's

4 the rule that we believe we have the most experience with

5 both in terms of the agency and the industry in applying

6 risk insights, but then to take this broader set of what I

7 think has been referred to here today as the interlocking or

8 interlaced regulations that really go to the pedigree to

9 which the regulation should apply that could be addressed in

10 the next set of requirements. Again, that would largely

11 address the concerns that were raised in the South Texas

12 project graded QA pilot activity.

13 CHAIRMAN JACKSON: The staff's approach is to

14 continue the ongoing rulemakings to change parts of 10 CFR

15 part 50. You are suggesting that one should be holding up

16 the promulgation of the maintenance rule to define this

17 scope?

18 MR. FLOYD: I'm going to defer that question to

19 the second half of our presentation and we will address that

20 point specifically.

21 CHAIRMAN JACKSON: Okay.

22 MR. FLOYD: We agree that voluntary implementation

23 is the proper way to proceed at least initially. One of the

24 concerns that the industry certainly has is, is the benefit

25 really going to be here with the adjustment to risk-informed

1 regulation? We think the voluntary approach is the right
2 way to go to demonstrate that the benefits do indeed exist
3 and that we do get an improvement to safety with less burden
4 coincident with that.
5 We do believe, as I mentioned earlier, that
6 changing the scope of the maintenance rule should be an
7 early part of the reform effort once we reach a consensus or
8 decision on what is the proper scope of SSEs to which the
9 regulation should apply, largely for the reasons that it's
10 the one regulation that we have the most risk insights
11 available and most experience with applying risk insights.
12 Next slide, please.
13 I do want to report to you that we are developing
14 a new executive working group that has exclusive focus on
15 following risk-informing the regulations. We got the
16 agreement from our executives in December to form this
17 group. We sent out a request to the licensees for their
18 participation as members of the working group, which is
19 fairly standard practice.
20 I have to tell you we've been quite overwhelmed by
21 the amount of response that we have gotten. About half of
22 the utilities thus far have indicated a desire to
23 participate on this working group either at the executive or
24 senior manager level. I think it speaks to the promise that
25 this holds in risk informing the regulations and the benefit

1 that at least the industry thinks could be derived from
2 this. So there is a great deal of interest in this.
3 I know there has been some concern expressed by
4 the agency as to whether or not there is wholehearted
5 support within the industry for this type of approach, and I
6 think the response that we have gotten says that there is
7 certainly a great of interest but that we still have to
8 complete the show-me part of it, and that's an important
9 piece.
10 COMMISSIONER MERRIFIELD: One quick question. We
11 talked a lot earlier about our two-track approach. Do you
12 have any sense at this point as to the number of plants that
13 would choose to go down the track of being risk-informed
14 versus those that would choose the more traditional approach
15 under Part 50?
16 MR. FLOYD: No. I think it is difficult to get an
17 accurate count at this point. I think we probably have
18 three or four plants that are interested in being pilot
19 plants to test out the concept right now, but I think the
20 rest are pretty much waiting to see what are the benefits
21 from it.
22 I think one of the things that has added to the
23 amount of interest in this area is the success that Mr.
24 Holahan talked about on the ISI and the IST pilots as well
25 as the tech spec pilots. I think the word is starting to

1 get out within the industry that there were indeed some
2 benefits in pursuing those initiatives. I think that is
3 helping to spark further interest, but I don't have an
4 accurate count as to how many would go down one path. I
5 think the obvious answer is if turns out to be cost
6 beneficial to go down the risk-informed pathway, the
7 majority of the industry would certainly go down that
8 pathway.
9 We really see this working group as being a
10 counterpart for the NRC's PRA steering committee chaired by
11 Mr. Thadani. In fact we formed this working group
12 specifically with that thought in mind.
13 We will be conducting our first meeting early in
14 1999, and we do see a number of industry task forces,
15 certainly the various pilot activities, as falling under the
16 purview of that working group.
17 The goals that we have with the working group are
18 to work with the NRC in the public forum to develop an
19 approach for defining both what we mean by the
20 safety-significant scope to which the regulations should
21 apply in part 50 as well as risk significant configurations.
22 We really see the need to make this consistent with the
23 approaches that are being defined and outlined in the
24 assessment and overall reactor oversight process.
25 One thing I think is interesting is we had a lot

1 of discussion here a little bit earlier about the need for
2 plant-specific PRAs and the quality and certification of
3 PRAs that you would have to have to go down the
4 risk-informed pathway. Yet I would point out that at least
5 on the assessment area most of the risk information that has
6 been applied thus far has been using generic risk insights
7 from across the industry with very little plant-specific
8 insight fit into that process. It seems to be more of a
9 bracketing approach, which may be a lesson learned that we
10 can apply in this approach and not have to perhaps get so
11 involved in the details of the plant-specific PRA, depending
12 on how we structure the process as we go forward.
13 We do intend and do agree with the staff
14 recommendation to use the whole plant pilot plants to test
15 the approaches. As was mentioned, there are three willing
16 plants today that want to participate in that effort. We
17 have put out the word that we are looking for a boiling
18 water reactor, which is currently not one of the mix of
19 plants, to round out the types of plants that would be
20 involved in that study. We do expect to have a boiler
21 participate in the study.
22 We look forward to establishing the rule changes
23 to codify the new definitions and the changes to the
24 requirements to allow the balance of the industry to adopt
25 these changes once the pilot studies and insights are

1 completed.

2 That concludes my remarks.

3 CHAIRMAN JACKSON: Mr. Pietrangelo.

4 MR. PIETRANGELO: Thank you, Chairman. I want to
5 start out by talking a little bit about why the maintenance
6 rule is important to this whole risk-informed Part 50
7 effort. When the rule was promulgated in 1991 there was a
8 lot of talk and intent about it being the first
9 risk-informed, performance-based regulation. We've put a
10 lot of resources into it from both NEI and industry
11 perspective in terms of developing the guide and sending
12 people out in teams to look at maintenance rule
13 implementation and such. We really saw it as a new way of
14 defining what the regulatory framework would be. We've
15 talked to it as our flagship.

16 The implementation has not worked out that way.
17 We've gotten a lot of feedback from our members that the
18 baselines were principally programmatic inspection; they
19 weren't performance based; risk was used to some extent to
20 determine the level of monitoring, but yet the scope of the
21 rule was still very, very broad and what we have determined
22 as deterministic-plus.

23 At this point in the progression toward risk
24 informing Part 50 we don't think it has fulfilled its
25 original intent or promise yet, but we still think there is

1 a tremendous opportunity to do so.

2 What we are hearing from our members is that risk
3 informing the scope of the rule is the place to start. It
4 provides for the proper focusing given that we are going to
5 have a new assessment requirement.

6 It would codify in fact what the current
7 assessment models and tools we are using in the industry are
8 today. When the staff in the SECY that described the
9 proposed revision to the maintenance rule talked about some
10 of the weaknesses in the programs, to a large extent they
11 were weaknesses with regard to what do you do when you come
12 off your risk model or risk matrix for all the rest of the
13 SSCs. There is a potential here to exacerbate that problem
14 if the scope is not addressed in this current rulemaking.

15 Getting to Commissioner Merrifield's question
16 about participation and what Steve talked about a little
17 bit, we are starting to kind of fill out the foundation with
18 successes and the things Gary talked about in in-service
19 inspection and IST and QA and tech specs. But they've been
20 on a handful of pilots. It hasn't been the whole industry
21 participating in those efforts. That's why we think the
22 maintenance rule is one that can get the whole industry
23 moving in this direction versus just a handful of utilities
24 who have already made a big investment in this. We think
25 it's the right way to do this in terms of risk informing

1 Part 50.

2 Next slide, please.

3 This slide pretty much summarizes our comments on
4 the proposed revision. You've already talked to some degree
5 about some of the new terminology that would be introduced
6 in the rule. There hasn't been implementation guidance
7 developed to define these terms yet.

8 In fact, when we were trying to revise NUMARC 9301
9 in anticipation of this rulemaking this summer, a lot of the
10 iterations we went through with the staff was how to do deal
11 with the rest of the scope in the assessment process and we
12 never did nail that down.

13 When we were discussing this with the staff, our
14 tack was to take issue with the words that the Commission
15 put in the SRM in terms of risk-significant configuration
16 and try to come up with some other words. Quite frankly,
17 the words we came up with weren't any better.

18 We have changed tack since then and believe that
19 rather than argue the scope issue through these different
20 words that the scope ought to reflect what the intent of the
21 process is. That is, we don't argue with the premise that
22 you shouldn't place the plant in a risk-significant
23 configuration as long as that is well defined and
24 understood, but the scope to which you apply that assessment
25 also ought to be risk informed to make those processes match

1 up.

2 CHAIRMAN JACKSON: Do you believe that "minimal"

3 in 50.59 is better defined?

4 MR. PIETRANGELO: Yes.

5 CHAIRMAN JACKSON: How so?

6 MR. PIETRANGELO: We have Reg Guide 1.174 which

7 deals with permanent changes. There is no parallel criteria

8 that deals with configuration changes. You cannot use the

9 criteria in 1.174.

10 CHAIRMAN JACKSON: Is 1.174 being used to define

11 "minimal" in 50.59, Gary?

12 MR. HOLAHAN: No. We haven't really said that it

13 should. It seems to me there are some insights you could

14 derive from 1.174, but I don't think we have equated those

15 at this time.

16 MR. PIETRANGELO: We're going to talk about 50.59

17 on Wednesday, and I can tell you how we are going to do it

18 for this particular rulemaking.

19 CHAIRMAN JACKSON: How you hope to do it, not how

20 we do it.

21 MR. PIETRANGELO: I'm saying what our guidance

22 document says. That's what I'm referring to. In fact, we

23 are not preparing to change it at all. We'll talk about

24 that Wednesday.

25 MR. FLOYD: I would like to add one point to that.

1 Going back to the work that the staff has done on the
2 overall assessment process, there may be a fairly, not
3 lengthy path to resolution on this issue.
4 To the staff's credit, I think they have come up
5 with a very interesting approach under the assessment
6 process for taking inspection findings and trying to judge
7 the significance of inspection findings consistent with the
8 thresholds that have been established at least in draft with
9 the performance indicators. What it really looks at is
10 three parameters: What's the duration of the condition?
11 What is the likelihood that that particular piece of
12 equipment or system would be needed? And what is the degree
13 of redundancy or backup capability for that function?
14 Through a matrix fashion it tries to characterize
15 whether it's risk significant, significant or not
16 significant in terms of its configuration or condition.
17 There may be some very good translatable lessons from that
18 over into this.
19 CHAIRMAN JACKSON: Hence my comment that the
20 various things we are trying to do do need to be consistent
21 with each other.
22 MR. FLOYD: I couldn't agree more, Chairman.
23 CHAIRMAN JACKSON: Secondly, we need to be equally
24 comfortable or equally uncomfortable with undefined terms as
25 we go across the regulatory spectrum. If one looks like it

1 has more to it than you want to do and therefore the lack of
2 definition is a problem, then from my point of view, from a
3 public policy point of view, not having sufficient
4 definition, even if it allows you to do less under the rule,
5 is an equally important issue. So it can't be an issue
6 because of the potential to have you do more than you want
7 to do and not be an issue if it allows you to do less than
8 you heretofore have had to do. I'm just telling you kind of
9 an operating caveat from my point of view.
10 MR. PIETRANGELO: Right. Before we get to the
11 next slide, let me comment that I think from our perspective
12 you ought to have them all defined so you know what it is
13 when you do the rulemaking. At least with the other rule we
14 are going to talk about Wednesday with regard to
15 consequences there are options that the staff provided in
16 the proposed rulemaking to define what minimal means. I
17 think there is a contrast here.
18 The second bullet on here, I think this came up in
19 the previous discussion about other places where there could
20 be conflicts between a risk-informed approach versus the
21 existing deterministic. I think Gary touched on that, this
22 reconciliation of the existing technical specifications with
23 this new assessment provision in the maintenance rule.
24 Yes, licensees would have to live with the
25 minimum, but I think that is kind of what has been feared

1 all along, that you take the most restrictive things out of
2 a risk-informed approach and the most restrictive things out
3 of a deterministic approach, and that is what the licensee
4 has to live with. If that's the case, you're not going to
5 get many takers from a licensee perspective.
6 COMMISSIONER McGAFFIGAN: Madam Chairman.
7 CHAIRMAN JACKSON: Yes, please.
8 COMMISSIONER McGAFFIGAN: When we started the
9 "should" to "shall" stuff sometime ago Ken Rogers was still
10 on the Commission. I remember a meeting where we almost
11 voted to change "should" to "shall" as we were sitting here
12 after Ken made an intervention. The notion was that there
13 was already NUREG-9301 guidance that really went beyond the
14 rule, in all honesty. It almost changed the "should" to
15 "shall" and there were a lot of people out there acting as
16 if "should" were "shall" and so it was not going to be any
17 big deal to changing "should" to "shall." We did something
18 more. We introduced these terms which came from the
19 statements of consideration of the rule that everybody was
20 already following.
21 Is it the transition into the rule of the terms
22 having previously been in the statements of consideration
23 and the "should" to "shall" that suddenly leaves this
24 concern that we had better make sure everything is darn well
25 defined?

1 MR. PIETRANGELO: Yes.

2 COMMISSIONER McGAFFIGAN: I was a little
3 disappointed. You said you tried last summer. We gave the
4 staff very specific instructions in the SRM to work with the
5 industry to be in a position to update. I guess you are on
6 Rev. 2 or 3 of NUREG-9301.

7 MR. PIETRANGELO: Rev. 11, in draft form.

8 COMMISSIONER McGAFFIGAN: That we would be in a
9 position in our 1.160 -- I hope it's not Rev. 11, but it
10 must be -- to endorse yours. We've broken that off for the
11 last three months.

12 MR. PIETRANGELO: In retrospect, Commissioner, I
13 think had we not been as sensitive to the words in the rule
14 and just went ahead and developed the criteria, both
15 quantitative and qualitative for that, we probably would
16 have been better off, but again our tack was to try to
17 propose different words.

18 To sum it up, the words the Commission proposed in
19 the SRM call for a judgment: don't place the plant in a
20 risk-significant configuration. What does that mean? The
21 way the configuration risk management program that people
22 have been committing to to get their extension in their AOTs
23 for tech specs is more of an action oriented requirement:
24 you will have provisions for this, this and this if you
25 enter the AOT, and it's less judgmental in terms of having

1 them develop the criteria.

2 We are gearing up to do this now. We should have

3 probably been working more on the criteria than arguing with

4 the words in the rule.

5 COMMISSIONER McGAFFIGAN: The problem with the old

6 rules even without the "should" to "shall," we've always

7 told you to do an assessment, but we always told you to do

8 something more to take it into account. The rule that is on

9 the book says you should take it into account.

10 I think as we parsed that old sentence, which was

11 a monstrosity, we were trying to figure out what do you do

12 beyond just doing an assessment. What do you do with the

13 results? What are you supposed to do with the results?

14 So you had this sentence that came from the old

15 statements of consideration and you tried in the current

16 Rev. 11 or whatever it is of 9301. This particular chapter

17 hasn't changed a lot. You tried to tell people what to do

18 with the results and you used words almost like "avoid

19 risk-significant configurations."

20 I'm just a little frustrated that we haven't come

21 together on what these words mean and in the last few months

22 we have sort of started down this other path.

23 MR. PIETRANGELO: To be honest, I don't think we

24 came to the conclusion that the scope change was needed

25 until well after a lot of that discussion to get over the

1 hump that we couldn't get over this summer.

2 CHAIRMAN JACKSON: Yes, and the hump when we were

3 talking about 50.59, which you know is a neuralgic point

4 with me about scope, because it's the same issue in the end

5 at a fundamental level.

6 MR. PIETRANGELO: I'd agree with that, Chairman.

7 CHAIRMAN JACKSON: I understand your point.

8 MR. PIETRANGELO: I think that's enough on the

9 maintenance rule.

10 [Laughter.]

11 COMMISSIONER McGAFFIGAN: You skipped a slide.

12 MR. BEEDLE: We talked about all these enough that

13 I don't think it's worth belaboring.

14 CHAIRMAN JACKSON: Okay. We're not trying to cut

15 you short.

16 MR. PIETRANGELO: That slide kind of speaks for

17 itself.

18 MR. BEEDLE: I think the plan that Dr. Travers

19 described along with members of his staff this morning

20 clearly represents an opportunity for the Commission and the

21 industry to move farther down the line of safe operation for

22 these nuclear plants.

23 Our thrust and scope and the maintenance rule and

24 50.59 has all been an effort to try and capitalize on an

25 opportunity to move in that direction. Whether it gets done

1 today or tomorrow, probably sooner the better. I think I've
2 heard those words before. It is one of those things where
3 if we make the maintenance rule change today, I hope that it
4 doesn't forestall making another rule change that would get
5 this scope problem resolved for us.
6 CHAIRMAN JACKSON: Let me ask you two questions.
7 I'm chastened by how long we've been talking about margin
8 and minimal. Do you have a sense of how long it would take
9 to come to some concurrence on the definition of terms.
10 MR. PIETRANGELO: For scope, we think we can do it
11 within six months. The reason, Chairman, is that every
12 licensee under their current maintenance rule implementation
13 has to take a cut at this in terms of establishing the level
14 of monitoring in the rule, and that used both risk insights
15 and an expert panel process. So we are not starting from
16 ground zero.
17 We had experience at each licensee that has gone
18 through this. The work South Texas has done as far as their
19 graded QA effort I think we are intending to incorporate in
20 the development of this. I think it's an approach. You are
21 not going to get a set. It's an approach that has to be
22 used. I think we are very close to defining what that
23 approach is.
24 CHAIRMAN JACKSON: But because you have this issue
25 of linkages across the board, you may want to take the

1 maintenance rule as a laboratory relative to risk informing
2 Part 50, but when you really have to go through and do the
3 kind of analysis that will ensure that that consistency
4 exists, while you may feel comfortable that within a certain
5 time frame you could do it for this specific rule, when you
6 are going across the board, then I think you are talking an
7 inherently longer time frame.
8 I have a question for you in terms of a compromise
9 kind of approach. If the Commission went forward with the
10 maintenance rule as it is proposed but it did not become
11 implemented until these definitions in the new form were
12 resolved and that could form the basis of the full
13 risk-informed rulemaking whether the maintenance rule is the
14 first part of that or part of an omnibus one, would that not
15 go some way toward addressing what the greatest concerns or
16 fears are?
17 MR. BEEDLE: I think if the Commission goes
18 forward with a maintenance rule that leaves some ambiguity
19 and puts that off until some subsequent guidance is issued,
20 it would serve the purpose, if it was accompanied by
21 guidance to the staff, to resolve the scope and the risk
22 implications. Then I think it would have some value. If it
23 doesn't direct the staff to deal with the scope issue, then
24 I'm not sure that it would serve a useful purpose.
25 CHAIRMAN JACKSON: I understand.

1 MR. BEEDLE: It's either the purpose of changing
2 the rule or it's a signal to the staff and the industry that
3 the Commission is intent on changing the direction of the
4 regulations.
5 CHAIRMAN JACKSON: Okay.
6 Commissioner.
7 COMMISSIONER McGAFFIGAN: Last Friday, unless it
8 was disrupted by the snowstorm, there was a meeting on 50.59
9 between the staff and the industry to go over the industry
10 comments. It was a public meeting.
11 MR. PIETRANGELO: It was not disrupted.
12 COMMISSIONER McGAFFIGAN: It was well noticed.
13 There is also described in some of the literature I saw an
14 effort at convergence on this margin of safety issue where
15 scope considerations also come in.
16 Would there be any value in having similar
17 meetings with the staff on the maintenance rule as they try
18 to deal with your comments and see if there is a convergence
19 path?
20 MR. PIETRANGELO: We had a convergence meeting
21 even before Friday on that very issue, Commissioner. I'm
22 not saying it can't be done. Clearly, though, being very
23 candid with the Chairman's question, our preferred
24 alternative is to do it in a one-step process. If we don't,
25 then we are going to have these kind of meetings trying to

1 address maintenance rule guidance and define those terms.
2 We don't have that many resources either to divert and say,
3 all right, we want this group working on the importance to
4 safety scope and another group trying to finesse the
5 maintenance rule guidance and this assessment provision. It
6 almost puts us on a two-track path.
7 We'd prefer to do it starting with the scope issue
8 in terms of risk informing Part 50 and then apply it to the
9 maintenance rule. From a licensee perspective and thinking
10 through this, even if we did say, all right, let's finesse
11 this in the guidance, then six months later you come up with
12 a scope change to the rule and say never mind about all that
13 stuff, it's done; it's not even in the rule anymore.
14 COMMISSIONER McGAFFIGAN: As I understand it,
15 saying, yes, we will look at risk-significant configuration.
16 MR. PIETRANGELO: That one we could start working
17 on right away.
18 COMMISSIONER McGAFFIGAN: That primarily means the
19 more safety-significant or the risk-significant systems.
20 That's what gets modeled in the PRA and engineering
21 judgments are made on and operational experience gives you
22 information on. At the moment I think the concern of the
23 industry, as I hear it, is that if it isn't de-scoped in
24 this round and we go for another round of comment because it
25 would be a significant change from what we proposed, then

1 people will be chasing their tails looking at whether
2 changing this lightbulb that burned out somewhere is risk
3 significant.
4 That's not our intent. I think we could make that
5 clear in the guidance, but if that is the fear, then the
6 later rule change will absolutely clarify that beyond
7 whatever clarification we provide in the guidance today,
8 that we are really looking at times when core damage
9 frequency for a period of time gets into ten to the minus
10 two, ten to the minus three for a few hours or something. I
11 thought from the discussions last summer it was clear that
12 that is what we were talking about, and screwing a lightbulb
13 in isn't going to affect that.
14 MR. PIETRANGELO: We never had any question about
15 the intent of the staff in trying to do the right thing.
16 That's not it. From our perspective the cleanest way to do
17 it is to do it in the scope of the rule, because it's
18 risk-informed regulation risk informing Part 50. I know we
19 can risk inform guidance.
20 It's message-sending by the Commission too in that
21 regard. This rule was the flagship. It ought to be the
22 example.
23 COMMISSIONER McGAFFIGAN: But then you get to the
24 discussion we had earlier. Say we are going to make this
25 change and say it's your change, the famous 42 rule changes

1 which are really mostly one, which is to change words, the
2 definition of "important safety" in numerous places in the
3 regulations and conform them all so that they are all the
4 same scope for this set of regulations that bears on
5 operation. The words are "operating experience," "PRA
6 insights," or "engineering judgment." Those are the things
7 that will determine what is important to safety.
8 Does it make sense to do it in the maintenance
9 rule first or does it make sense to do it everywhere in a
10 comprehensive approach so that you don't have one scope for
11 the maintenance rule and one scope for all these other
12 rules?
13 MR. PIETRANGELO: Let me clarify that. Steve,
14 please chime in.
15 I think our intent is to do it once and for all.
16 That's just the definition. There would be an approach
17 behind that definition as to how you get there.
18 COMMISSIONER McGAFFIGAN: Those are big words.
19 There would be a desperate need for guidance mutually agreed
20 between you and the staff as to what those words mean in
21 practice.
22 CHAIRMAN JACKSON: So you are willing to put the
23 50.59 rulemaking on hold to do that also?
24 MR. PIETRANGELO: No, we're not, Chairman. There
25 is a whole separate reason for that 50.59 rulemaking. They

1 are not the same.

2 CHAIRMAN JACKSON: They are the same.

3 MR. PIETRANGELO: There is a stability question in

4 50.59.

5 CHAIRMAN JACKSON: Don't tell me about the design

6 basis rule and all that in terms of a fundamental

7 risk-informed approach to changes, tests and experiments in

8 the plant and dealing with degraded. Don't get me started.

9 [Laughter.]

10 MR. BEEDLE: We are really pleased to see the

11 NRC's approval of a number of specific risk-informed

12 activities, and we thank you very much.

13 [Laughter.]

14 CHAIRMAN JACKSON: Thank you. Any further

15 questions?

16 [No response.]

17 CHAIRMAN JACKSON: I think we understand your

18 point. We have to kind of weigh this.

19 MR. BEEDLE: Let me make one observation. The

20 effort that the staff has put in to dealing with this

21 assessment process has been, I think, Herculean in nature.

22 I think they have come a long way in trying to resolve those

23 problems. I'd like to take some credit for the industry's

24 contribution, but I think the real bulk of the effort was on

25 the part of the staff. They've come up with a lot of good

1 ideas. Given the same approach to solving the scope issue
2 on these complex rules and regulations that we deal with, I
3 think it is something that is achievable in a relatively
4 short period of time.
5 CHAIRMAN JACKSON: Thank you.
6 We will now hear from Mr. Lochbaum from the Union
7 of Concerned Scientists.
8 MR. LOCHBAUM: Good afternoon.
9 Slide two, please.
10 The Nuclear Regulatory Commission must resolve
11 three key issues before proceeding any farther down the road
12 towards risk-informed regulation. Two of these issues deal
13 with technical deficiencies in the plant-specific risk
14 assessments. The third issue is regulatory effectiveness.
15 Slide three, please.
16 Plant-specific risk assessments are flawed because
17 of the way they handle, or more accurately, the way they
18 ignore passive design problems. Examples of recently
19 reported passive design problems include the severed pipe
20 from the sodium pentaborate tank to the reactor vessel at
21 Big Rock Point, the undersized emergency core cooling piping
22 at Haddam Neck, the inadequate cooling water system for
23 emergency equipment at Maine Yankee, a handful of problems
24 affecting the recirculation spray system at Millstone Unit
25 3, and the inadequate ventilation system for the emergency

1 diesel generators at Davis Besse.

2 COMMISSIONER McGAFFIGAN: Can I ask a question?

3 CHAIRMAN JACKSON: Sure.

4 COMMISSIONER McGAFFIGAN: The point was made

5 earlier that this is also true for deterministic analyses.

6 Gosh knows we don't want equipment that is inoperable for

7 long periods of time like Big Rock Point, but presumably a

8 deterministic analysis also counted on that system working,

9 not just the PRA.

10 MR. LOCHBAUM: The difference is that under

11 risk-informed regulation if you are just swapping equal, it

12 wouldn't matter, but along with the swap to risk-informed

13 regulations the reduction in testing frequency, inspection

14 frequency, what you look at, there are a lot of things that

15 are associated with the risk-informed regulation. It's not

16 just a change in the name of the regulatory model.

17 COMMISSIONER McGAFFIGAN: To stay on that Big Rock

18 Point case, if we had determined that that was a

19 risk-significant item, whatever testing requirements we have

20 today didn't capture that system. It was so inaccessible

21 that they made the judgment that they wouldn't go and see

22 that that pipe had been severed. But if it turns out in a

23 risk-informed approach that the item turns out to be

24 important, then maybe you make a judgment. This is all

25 hypothetical. Maybe it would have made a judgment that, by

1 gosh, we'd better go in and make sure that thing is really
2 working because it's a critical backup system in accident
3 scenario Q.
4 CHAIRMAN JACKSON: Or conversely, there could be a
5 requirement relative to systems like that and maybe a robust
6 risk analysis would indicate it is not as important as we
7 might have thought it was. So the real issues is to
8 rationalize the decision making. I guess the real question
9 has to do with trying to get at the root of the criticism.
10 Is it something that you feel is fundamental with
11 risk-informed regulation or does it have to do with how NRC
12 implements its regulatory program, period?
13 MR. LOCHBAUM: I think it's a little of both. I
14 don't think it's quite as easy as just answering one.
15 You asked a question earlier about as-built plant.
16 The Commission has made several attempts to get the industry
17 to comply with that requirement, with mixed success. If we
18 had that foundation, knowing that the plants' as-built
19 configuration matched their design requirements, then you
20 could go to risk-informed regulation because you are looking
21 at the right things. We would think that would be a good
22 move. Our concern is that we don't have that assurance.
23 This proposed change would allow lesser degree of
24 safety at the plants because you are looking at things less,
25 what you are looking at is less, all those things. Besides,

1 we are already stuck with what we have. We are concerned
2 that this would be going from what we have, which has
3 problems with it, to something that is of lesser safety
4 margin. Our recommendation would be to take the resources
5 it would take to go to this approach and fix the first
6 thing, which is that the as-built plants are not good.
7 CHAIRMAN JACKSON: Do you feel that the NRC's
8 prescriptive approach, if implemented in the sense that you
9 mean, is fundamentally sound?
10 MR. LOCHBAUM: Yes. I look at it not only from my
11 own experience, but I look back at UCS's experience back to
12 the creation of at least the Nuclear Safety Department. We
13 very seldom question the rule itself, but we are almost
14 always concerned that the adherence to the rule is suspect
15 or problematic. I think that would be the problem we have
16 with the current regulatory scheme.
17 CHAIRMAN JACKSON: Okay.
18 MR. LOCHBAUM: The current plant-specific
19 assessments account for mistakes made by operators. The
20 probability of an error is based on an extensive human
21 performance database. Thus, although these mistakes have
22 been made and remedial training has been conducted to
23 prevent recurrences, plant-specific risk assessments
24 conservatively assume that the errors will be made at the
25 same rate as they have been in the past.

1 The same applies to active equipment failures.
2 Examples are valves that fail to close or open when needed,
3 pumps that fail to start or stop prematurely when needed are
4 treated like operator errors. There is a large database of
5 equipment failures, and even though this equipment has been
6 fixed and preventive maintenance programs have been upgraded
7 to address these things, the risk assessments assume that
8 they occur at the same rate as they have in the past.
9 Slide four, please.
10 CHAIRMAN JACKSON: Let me ask you a question. I'm
11 going to ask Mr. Thadani. Is this true? If it's not true,
12 then how do we understand that it's not true? If it is,
13 then what are we going do about it?
14 MR. THADANI: First of all, yes indeed, Mr.
15 Lochbaum is correct. When there is a problem identified,
16 the problem is corrected and you would hope that at least at
17 that particular facility that failure mode or cause is not
18 going to lead to some problem down the road. This whole
19 process is a random process. At least that's how we treat
20 it, as a random process.
21 There are several contributors to any given
22 undesired state. When you use either plant-specific data or
23 generic industry data, if the corrective action has led to a
24 reduction in repeated failures, that will show up in the
25 database, and that would then be accounted for to that

1 extent.

2 In the development of the fault tree the cause

3 would still be identified but the data that goes into it

4 would be different.

5 CHAIRMAN JACKSON: Except that Mr. Lochbaum, if I

6 am correct, is saying that in point of fact there isn't this

7 updating.

8 MR. LOCHBAUM: There is no feedback for design

9 failures, just active component failures.

10 CHAIRMAN JACKSON: There is no feedback for design

11 failures, just for active components.

12 MR. THADANI: For design failures that is correct.

13 That is an area that is not dealt with in the risk

14 assessments. That's a recognized weakness.

15 CHAIRMAN JACKSON: So how do you handle that?

16 What do you do about that?

17 MR. THADANI: Design failure is like -- pardon me

18 for using this language -- a blunder in my view. It's not

19 really a random issue. At a plant there is or is not a

20 design problem. It is not the sort of thing you can deal

21 with in a probabilistic manner.

22 CHAIRMAN JACKSON: But you can in the sense of

23 evaluating its importance.

24 MR. THADANI: We use what we call importance

25 measures. Thank you for saying that. There are different

1 types of importance measures we use. One, which is called
2 risk achievement worth, we assume a system is unavailable
3 and then rack it up in terms of what would be the impact in
4 terms of safety if that system were just not available,
5 period. The conditional probability is one for that system
6 not being available. What is the impact on safety?
7 You can rank order, and we do, the systems in
8 terms of their importance to say protection system appears
9 in sequences, but if you assume protection system is not
10 available, say for a design problem, it would show up
11 immediately.
12 CHAIRMAN JACKSON: What about the severed line at
13 Big Rock Point? Actually, one that is of more interest to
14 me is the piping failure in the fire protection piping that
15 leads to internal flooding.
16 MR. THADANI: It would show up in the database. A
17 failure that leads to internal flooding would show up in the
18 database. The distinction I'm trying to draw is not knowing
19 for that specific plant that that condition exists. In the
20 case of that specific plant the probability is pretty high,
21 and the only way you can get at it is through things like
22 importance measures.
23 CHAIRMAN JACKSON: Are those importance measures
24 systematically used?
25 MR. THADANI: It's difficult for me to say that we

1 have systematically used them in the past, but it is an area
2 that we have said the evaluations have to look at,
3 sensitivities and sensitivities coming through the kinds of
4 things we are talking about. I would note that it is driven
5 by the relative application, the relative importance of some
6 of these issues there.
7 CHAIRMAN JACKSON: Thank you.
8 MR. LOCHBAUM: Slide five, please.
9 The final example of passive design problems is in
10 the fire protection area. It's our understanding the
11 plant-specific risk assessments assume that fire barrier
12 penetration seals are 100 percent effective in preventing a
13 fire from propagating from one fire area into an adjoining
14 fire area.
15 The information in NUREG-1552, either the original
16 or the supplement, demonstrates that these assumptions are
17 non-conservative. Many penetration seals have been found to
18 be improperly installed. Others have been found not to be
19 installed at all. Thus it is absolutely wrong for the risk
20 assessments to model these barriers as being 100 percent
21 effective. Reality doesn't support that assumption.
22 The NRC needs to clearly define how passive design
23 problems are to be handled within plant-specific risk
24 assessments and then conduct evaluations to ensure that
25 plant owners are meeting those expectations.

1 Slide six.

2 Plant-specific risk assessments are seriously
3 flawed because virtually identical nuclear plants can have
4 widely disparate risk profiles due to different assumptions
5 and level of detail.

6 As UCS will document in an upcoming paper on risk,
7 having the highest core damage frequency at one plant is not
8 even among the top five events at a sister plant. A Boeing
9 737 aircraft with United painted on its side is not orders
10 of magnitude safer or riskier than a Boeing 737 aircraft
11 with Delta painted on it. Yet a Westinghouse PWR operated
12 by utility X can, on paper, appear to be much safer than an
13 identical PWR operated by utility Y.

14 CHAIRMAN JACKSON: Their being identical really
15 has to do with the nuclear steam supply system, right?

16 MR. LOCHBAUM: The plants that we are looking at
17 is Calloway and Wolf Creek, which were built as SNPPS
18 plants. They paid a premium to be identical. So we are
19 going to look at those two plants and show that there is a
20 widespread difference. The reason the difference is
21 significant is that if I was making a change to the plant or
22 a procedure that controlled the plant, I would tweak the
23 input parameters to my peer and get any number I wanted to
24 out of it, up, down, sideways, whatever. There is that much
25 float in the numbers. And I've done it before. So it's not

1 a theoretical basis. I did it at Indian Point.

2 CHAIRMAN JACKSON: You did?

3 MR. LOCHBAUM: Yes.

4 CHAIRMAN JACKSON: This is when you were on the

5 licensee side?

6 MR. LOCHBAUM: That's when I was paid with a

7 different thing, yes. It was recently done again at Indian

8 Point 3 with the HPSI ADS submittal. There was some very

9 interesting work done on that one.

10 The concern is that the risk assessments have such

11 large uncertainties and so much float that you can change

12 them to get any answer you want. You could double the

13 actual risk at the plant with a proposed change, alter the

14 number and show that it's actually in fact safer if you do

15 that. Or you could show that it's the riskiest thing you've

16 ever done in your life. The whole thing is smoke and

17 mirrors.

18 CHAIRMAN JACKSON: Let me back you up here. Even

19 if it were smoke and mirrors, isn't the point of a

20 risk-informed approach that it's not just this smoke and

21 these mirrors, that in fact you are using the risk

22 assessments within a larger context that involves the use of

23 deterministic and other engineering analyses?

24 MR. LOCHBAUM: That should be the approach. I

25 think our concern is that it won't be the approach; it will

1 be loosey-goosey, and thus you could do anything you
2 virtually wanted to and justify it with the math. That's
3 what our concern is, how it has been done in the past and
4 how it is headed right now.
5 CHAIRMAN JACKSON: Gary Holahan's job depends on
6 that not happening.
7 MR. LOCHBAUM: I wouldn't trade jobs with him for
8 anything.
9 COMMISSIONER McGAFFIGAN: I'm trying to understand
10 the difference between getting a license amendment that is
11 deterministic. David Lochbaum's work and firm are pretty
12 good at manipulating deterministic analyses too. Is a
13 deterministic analysis any less, in your view, smoke and
14 mirrors than PRA analysis?
15 We had the ACRS in front of us. The ACRS tells us
16 the benefit of a risk-informed approach, use of more risk
17 insights is that a typical PRA at least makes these things
18 transparent, whereas a deterministic analysis, the argument
19 goes, there is a tendency to have a certain degree of
20 opaqueness.
21 You are saying that good staffers and industry can
22 make PRAs as opaque as deterministic, but we're trying to
23 make a judgment: stay purely deterministic, which is not
24 what the Commission decided in 1995, or bring in these risk
25 insights. Presumably the staff is not quite as

1 loosey-goosey as you suggest. Is there greater transparency
2 or not in the risk-informed approach as opposed to the
3 purely deterministic approach?
4 MR. LOCHBAUM: We don't think so. If we were the
5 Union of Concerned Scientist Fictionists, we would love this
6 approach. Based on what we know about how these are being
7 used, this is not good science. Not yet. It might be some
8 day. Once you correct the problems with the design basis
9 and the other things we are pointing out, they might be very
10 great tools, and they should be, but right now they are so
11 flawed that they are not transparent when you are neglecting
12 that reality. I will go into some of that a little bit
13 more. When I initially made these comments I didn't have
14 98-300 in front of me.
15 CHAIRMAN JACKSON: How much do your comments
16 relate to the numbers as opposed to the logic of the
17 approach?
18 MR. LOCHBAUM: I don't think you can separate the
19 two.
20 CHAIRMAN JACKSON: Yes, you can.
21 MR. LOCHBAUM: I can?
22 CHAIRMAN JACKSON: I think you can.
23 MR. LOCHBAUM: I know I can't. Let's put it that
24 way.
25 CHAIRMAN JACKSON: Come around and see me.

1 MR. LOCHBAUM: We're concerned about the numbers
2 more so than the logic. If we corrected the problems of the
3 deficiencies, the logic is pretty sound.
4 CHAIRMAN JACKSON: I understand.
5 MR. LOCHBAUM: Slide seven.
6 The third issue that we feel needs to be resolved
7 before moving any further is regulatory effectiveness. By
8 that I'm referring to the public perception of your
9 effectiveness as a regulator. The current regulatory scheme
10 is prescriptive and rule based. To the public that implies
11 a system with clearly defined lines between what is allowed
12 and what is not allowed.
13 Given that impression, you might understand why
14 the public lacks confidence in the NRC's regulatory ability.
15 After all, if the rules are black and white, why did the NRC
16 sit and watch while things at Millstone, Salem, D.C. Cook,
17 Clinton, Lasalle, Indian Point Three, Crystal River get so
18 bad that multiple year outages were required to restore the
19 safety margins?
20 What do these perceptions have to do with
21 risk-informed regulation? The public believes that the
22 nuclear industry favors moving to this performance-based,
23 a/k/a touchy-feely system, because it wants to continue
24 enjoying the benefits of non-regulation while losing the
25 disadvantages of appearing on the cover of Time. Why should

1 the public believe that the NRC would be more effective
2 protecting them using a touchy-feely system than it has been
3 in the past using the prescriptive system?
4 It's a rhetorical question. After all, adequate
5 nuclear safety margins can be maintained in theory using
6 either regulatory scheme. But theories are immaterial.
7 What matters is that the public feels that the agency has
8 not been effective using the prescriptive regulatory scheme.
9 The public also senses that this agency is being dragged
10 kicking and screaming by the nuclear industry and being
11 shoved by the U.S. Senate towards risk-informed regulation.
12 I also would cite the culture survey that was done
13 by the inspector general's office last year that would seem
14 to indicate that there is a big break between senior
15 management and the working --
16 COMMISSIONER MERRIFIELD: I've only been here for
17 eight or nine weeks. You again quote from your written
18 testimony that the NRC is being dragged kicking and
19 screaming by the nuclear industry and congress towards
20 risk-informed regulation. In the conversations I've had
21 with the Commissioners I certainly don't believe that that
22 is the case. In the conversations I've had with staff I
23 haven't found that to be indicated either. Are there
24 particular staff actions that you have that would lead you
25 to the perception, or is that just an anecdotal perception?

1 MR. LOCHBAUM: It was based largely on the culture
2 survey that was done by the inspector general's office last
3 summer. It noted that the senior management at the NRC has
4 embraced risk-informed regulation but everybody else is a
5 little more skeptical or is a little doubtful that it will
6 be a productive path. That's the larger number of folks.
7 That's the data I'm basing that conclusion on, and those are
8 the folks I talk to most often.
9 COMMISSIONER MERRIFIELD: They haven't made me
10 informed of it. I don't know if the other Commissioners
11 have been aware of that.
12 CHAIRMAN JACKSON: I think it's fair to say that
13 when one is migrating the regulatory paradigm that there is
14 a cultural issue, and that issue exists not only within the
15 NRC but outside of the NRC, and would daresay even with our
16 licensees. You have varying levels of comfort and
17 understanding of what the approach is meant to accomplish,
18 which is why definitions and working together to resolve
19 differences, whether everyone gets exactly what he or she
20 wants, is an important part of that migration. That is why
21 we are all here.
22 MR. LOCHBAUM: I've been at plants where a
23 substantial change in direction was made. It takes a while
24 for everybody to face in the same direction. I recognize
25 that as reality. That culture survey is a little bit larger

1 than I guess I would have expected at this stage of the
2 game.
3 COMMISSIONER DICUS: My understanding is that some
4 of the concerns expressed by the staff on the issue really
5 had to do with ensuring that on the one hand they have the
6 training that they need to buy into this issue and have the
7 support of management. I don't think I would characterize
8 that as kicking and screaming, being dragged to a certain
9 position. I think they were expressing some sound concerns
10 and we are addressing those concerns.
11 MR. LOCHBAUM: We've heard some feedback from
12 various inspectors that under the current system if they
13 find a problem in the plant, it has to go up through NRC
14 ranks to either get a finding or not a finding. They feel
15 that it's difficult to do that now and it would be a greater
16 burden to show a finding as a concern in the future under
17 this new system. So they are reluctant to go to something
18 that reduces the value of their job function. Those are the
19 concerns that affect me the most, because I guess I identify
20 myself most closely with the resident inspectors or the
21 people in the field. I guess I am echoing their concerns.
22 COMMISSIONER McGAFFIGAN: We talked earlier about
23 the new assessment process. My understanding is you've been
24 involved in it. Don't the same issues come up? It's
25 supposed to be performance based, and you indeed, if I

1 recall, have urged us to focus on most important things and
2 have clear indicators and these cornerstones and all that.
3 It's risk-informed to some degree also, isn't it, the new
4 assessment process?
5 CHAIRMAN JACKSON: Yes.
6 COMMISSIONER McGAFFIGAN: Why is it okay in
7 assessment and inspection but when we apply it to rulemaking
8 and to the scope of rules and all that it becomes
9 problematic?
10 MR. LOCHBAUM: I think it's problematic from the
11 standpoint of the amount of resources it will take in order
12 to get to risk-informed regulations, which I will get to a
13 little bit more. There are no safety benefits, according to
14 your staff. So it's all burden reduction.
15 COMMISSIONER McGAFFIGAN: Our staff said earlier
16 today that there are potential safety benefits. The
17 specific example was Comanche Peak. While giving relief in
18 two areas they added 25 components to the enhanced testing
19 regime that wouldn't have been captured by the current
20 version of Part 50. That was the result. So there is a
21 safety benefit. We deregulate to some degree and we capture
22 a bunch of systems that were not previously captured as a
23 result of a more thorough analysis.
24 MR. LOCHBAUM: In Attachment 4 to that SECY paper
25 the staff says, "More fundamentally, it may be very

1 difficult to show that the risk-informed changes, in any
2 form, either will result in a substantial increase in the
3 overall protection of public health and safety or common
4 defense and security, the initial backfit threshold finding,
5 or are necessary for adequate protection."
6 In other words, they couldn't apply the backfits
7 that will make people do that.
8 COMMISSIONER McGAFFIGAN: Right, but the backfit
9 rule is a different test than a cost benefit. A substantial
10 increase is very high threshold. Those words are a term of
11 art in this agency. That is different from saying that
12 there isn't a benefit.
13 Like they said earlier, those 25 systems, when I
14 asked the question, aren't necessarily going to be the same
15 25 in another place. So they can't do a generic rule that
16 says those 25 systems are important and incorporated in the
17 ASME code, but yet they felt they got a benefit out of it.
18 It will not pass a 109 substantial benefit test,
19 but it passes at the margin a cost-benefit test, and from
20 the licensee's perspective, because they are getting the
21 deregulation, they are happy to give the additional
22 oversight over those 25 systems. So it's a win-win
23 situation, properly done. That's what I heard earlier.
24 CHAIRMAN JACKSON: To be fair, I think there are
25 two points that do come out from your comments. I think one

1 is one has to be very careful in language. I've actually
2 talked with the staff about this. The language has been
3 burden reduction and not unnecessary burden reduction or
4 definition of appropriate burden. So when you start down a
5 path and you are describing it as burden reduction as
6 opposed to unnecessary burden reduction or defining
7 appropriate burden, you are going to lose part of your
8 people from the beginning.
9 The second part, which is the pregnant question,
10 and the Commissioner spoke to it at least in the specific
11 instance, and that is again, is the agency prepared and are
12 all those involved prepared to understand that it is a
13 two-edged sword and will structure regulatory processes and
14 act accordingly? That relates to your credibility issue.
15 MR. LOCHBAUM: Exactly.
16 I have a few final comments I saw on 98-300 that
17 came out since I prepared the earlier comments. NUREG-1560
18 came out a few years ago that summarized all the IPEs that
19 were done. Figure 3-11, for example, illustrates the core
20 damage frequencies for Babcock & Wilcox plants.
21 This figure is very tough to see and almost
22 impossible for the people behind me to see.
23 The range is anywhere from three in 10,000 years
24 to less than one in 100 million years per reactor year for
25 core damage frequency for all the Babcock & Wilcox plants.

1 But there are some data missing from this table. TMI Unit 2
2 operated for one year and had one core damage event. That's
3 a core damage frequency of one per reactor year, but that
4 data point is not included. If my bad test scores had been
5 tossed out when I was in school, I would have been a
6 straight A student.
7 This morning I added up the operating lifetimes of
8 every U.S. reactor that has ever been licensed. That total
9 through this morning is 2,392.15 reactor years. That
10 doesn't exclude time that the plants were shut down; that's
11 the entire operating lifetime. So far we have experienced
12 one reactor core damage event in 2,392 reactor years. That
13 reality is not reflected in this document.
14 That goes back to our concern that we are cherry
15 picking the data, let alone the systems and what rules we
16 follow, and throwing out the stuff that tends to look a
17 little bad or a little risky.
18 Addressing the concern of design basis issues,
19 section 14.2 of this document describes the general elements
20 of a full-scope PRA. "The following assumptions are usually
21 found in a quality PRA: The plant is operating within its
22 technical specifications and other regulatory requirements;
23 the design and the construction of the plant are adequate."
24 The evidence of the last couple years would show
25 that one or both of those assumptions are flawed and the

1 PRAs are not quality PRAs because those assumptions cannot
2 be considered valid. Until those assumptions are made valid
3 and the PRAs are then quality PRAs, we shouldn't be
4 progressing any further, and UCS would recommend option 1 on
5 the staff's statement.
6 The SECY paper talked about, and it was discussed
7 in the earlier session, the potential for improving safety
8 decisions and increasing public confidence. We were kind of
9 interested in seeing how this came about, but you've already
10 asked the questions. We didn't think there was a survey or
11 a checklist or anything. Those are really nice attributes,
12 and I thought it would be good to throw in there, which we
13 agree with, but we are not sure how that would be
14 accomplished.
15 Thank you.
16 CHAIRMAN JACKSON: Thank you.
17 Let me thank you, Mr. Lochbaum, from the Union of
18 Concerned Scientists, the Nuclear Energy Institute, Mr.
19 Beedle, Mr. Pietrangelo and Mr. Floyd, and the NRC staff for
20 a very informative briefing. It's a long briefing because
21 of us.
22 As we have heard, there are some significant
23 accomplishments that have been made in the area of
24 risk-informed regulation.
25 Nonetheless, there do remain, first, some

1 implementation issues on the risk-informed pilots that are
2 being addressed, and second, several policy issues overall
3 have been identified for Commission consideration. Some of
4 them are examples that Mr. Lochbaum has raised.
5 Also the issue of the proposed modification of the
6 scope of the maintenance rule which received a lot of
7 discussion today should perhaps be looked at closely in
8 concert with a risk-informed scope of another important
9 rule. You know which one I'm talking about.
10 Nonetheless, the Commission will provide guidance
11 on these policy issues shortly, and I hope that all feel
12 that today's meeting has provided for an open discussion
13 regarding proposed direction as well as cautions that need
14 to be considered.
15 Whatever difficulties may lie ahead of us, the
16 fact that we are proceeding in these directions I think
17 bodes well for the future as we do sharpen our focus on
18 those things that most significantly impact public health
19 and safety and let go of those things that do not, but, as
20 Mr. Lochbaum has told us, with the right focus on
21 follow-through.
22 Unless any of my colleagues have any further
23 questions or remarks, the meeting is adjourned.
24 [Whereupon at 5:05 p.m. the briefing was
25 concluded.]

CERTIFICATE

This is to certify that the attached description of a meeting of the U.S. Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING ON RISK-INFORMED INITIATIVES PUBLIC MEETING

PLACE OF MEETING: Rockville, Maryland

DATE OF MEETING: Monday, January 11, 1999

was held as herein appears, is a true and accurate record of the meeting, and that this is the original transcript thereof taken stenographically by me, thereafter reduced to typewriting by me or under the direction of the court reporting company

Transcriber: John Ulmer

Reporter: Mike Paulus

BRIEFING ON RISK-INFORMED INITIATIVES

S. Collins, NRR
A. Thadani, RES
G. Holahan, NRR
T. King, RES

January 11, 1999

RISK-INFORMED INITIATIVES - OVERVIEW

- Activities are underway in a number of areas to take a risk-informed approach to regulation in both plant-specific and generic activities:
  - regulations
  - licensing
  - plant oversight
  - events assessment
- Risk-informed activities build upon current infrastructure, policies and practices:
  - PRA Policy
  - Risk-informed regulatory guides/SRPs
- Activities are an interoffice effort as described in the PRA Implementation Plan and response to the Chairman's Tasking Memorandum

RISK-INFORMED MODIFICATIONS TO 10 CFR 50

- SECY-98-300 proposes a two-phase review and modification of 10 CFR 50:
  - Changes to scope, definitions, and processes
  - Modifications to specific regulations
  - Clarification of staff authority
- Relationship to NEI whole-plant study:
  - Interaction on whole-plant study subsumed into overall effort to risk-inform Part 50
  - Agreement with industry to integrate study's pilot plant activities to facilitate potential Part 50 modifications
  - Specific activities and interface will be determined after SRM received on SECY-98-300.

RISK-INFORMED MODIFICATIONS TO 10 CFR 50-OBJECTIVES

Specific objectives of 10 CFR 50 modification:

- Enhance safety by focusing NRC and licensee resources in areas commensurate with their importance to health and safety
- Provide NRC with the framework to use risk information to take action in all regulatory matters
- Allow use of risk information to provide flexibility in licensing and operational areas

RISK-INFORMED 10 CFR 50 - OPTIONS

OPTION 1

- Continue only ongoing rulemakings to change parts of 10 CFR 50 (e.g., 50.59, 50.65, 50.72/73) and voluntary license amendment requests under risk-informed regulatory guides.

OPTION 2

- Continue Option 1 activities
- Develop risk-informed definitions, processes, and scope changes to systems, structures and components needing special treatment in terms of quality. Utilize maintenance rule as a first step.
- Utilize industry pilot studies to assist in scope and definition revisions
- Staff recommends implementation

RISK-INFORMED 10 CFR 50 - OPTIONS

OPTION 3

- Modification of specific regulations to make them risk-informed:
  - "Acceptable alternative" provisions in selected regulations
  - Modification of technical content to be risk-informed
  - Deletion of regulations with little safety significance
- Utilize industry pilot studies to assist in development.
- Staff recommends further study.

RISK-INFORMED 10 CFR 50 - POLICY ISSUES

- Voluntary or mandatory conformance with modified 10 CFR 50
  - Staff recommends voluntary
- Exemptions for pilot plants
  - Staff recommends use of exemptions for pilot plants
- Modification of Maintenance Rule scope
  - Continue near term rulemaking
  - Staff recommends utilizing maintenance rule as an initial step in revising the scope under Option 2
- Clarification of staff authority for risk-informed decision making
  - Staff recommends development of guidance to clarify application of risk-informed decision-making

SPECIFIC RISK-INFORMED ACTIVITIES - PROGRESS AND STATUS

- Inservice inspection:
  - Safety evaluation on Westinghouse Owners Group topical report issued - December 14, 1998
  - Safety evaluation of EPRI methodology underway
  - Vermont Yankee, Surry, Arkansas Nuclear One SERs issued
- Inservice Testing:
  - Comanche Peak safety evaluation report issued August 14,1998
  - Staff evaluating lessons learned from pilot plant

SPECIFIC RISK-INFORMED ACTIVITIES - PROGRESS AND STATUS (continued)

- Graded quality assurance:
  - South Texas proposed GQA program approved November 1997
  - South Texas Project experienced barriers to full implementation
  - Part 50 rulemaking would address the major issues

SPECIFIC RISK-INFORMED ACTIVITIES - PROGRESS AND STATUS (continued)

- Draft GQA inspection procedure undergoing management review and resolution of CRGR comments
  - Staff responding to CRGR issues and internal review comments

- Technical Specifications:
  - Several topical reports from CEOG and WOG approved
  - Plant-specific allowable outage time extensions approved

SPECIFIC RISK-INFORMED ACTIVITIES - PROGRESS AND STATUS (continued)

- Other Licensing Initiatives
  - BWR vessel shell weld inspections -SER provided to Commission
  - Whole plant study, Task 0:
    - ANO Hydrogen monitoring SER completed and issued;
    - San Onofre Hydrogen recombiner application under staff review (SER due 6/30/99)

GUIDANCE DOCUMENTS AND TRAINING - PROGRESS AND STATUS

- PRA quality
  - Draft ASME standard for Level 1 PRA (full power, internal initiators) being finalized prior to release for public comment
  - Industry peer review process - Perry pilot
- Inservice inspection regulatory guide/SRP
  - Regulatory guide and SRP completed and published for trial use (pending completion of ISI topical report reviews)

GUIDANCE DOCUMENTS AND TRAINING - PROGRESS AND STATUS (continued)

- Staff guidance and training:
  - PRA Steering Committee and Risk-informed licensing panel
  - Implementation guidance issued to raise priority of risk-informed licensing actions
  - Process guidance on implementation of risk-informed regulation
  - Staff training and communications

POLICY ISSUE
(Notation Vote)

December 23, 1998 SECY-98-300

FOR: The Commissioners

FROM: William D. Travers
Executive Director for Operations

SUBJECT: OPTIONS FOR RISK-INFORMED REVISIONS TO 10 CFR PART 50 - "DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES"

PURPOSE:

This paper proposes high-level options for modifying regulations in 10 CFR Part 50 to make them risk-informed and to delineate associated policy issues for Commission consideration. The staff seeks guidance on the Commission's preferred approach in order to develop a detailed rulemaking plan.

SUMMARY:

The staff has proposed a high level approach for incorporating risk-informed attributes into the Part 50 regulations, and is seeking Commission approval to proceed with a phased implementation strategy. After receiving Commission guidance, the staff will develop a rulemaking plan which includes more complete resource and schedule estimates. Two primary objectives of this effort are to develop a risk-informed regulatory framework that will enhance safety as well as reducing unnecessary staff and licensee burden. To initiate this phased effort, the staff is recommending (Option 2) changes to the regulatory scope of SSCs needing special

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treatment in such areas as quality assurance, environmental qualification, Technical Specifications, 10 CFR 50.59 and ASME code. This will be accomplished, in part, by developing risk-informed definitions for safety-related and safety important SSCs. While this approach would allow "grading" of special treatment requirements on SSCs based upon their risk importance, system functional capabilities would not be removed. Rather, the SSC functional capabilities (for low risk important SSCs) would remain in the plant and be expected to perform their design function but without additional margin, assurance or documentation associated with high safety significant SSCs.

The staff is also planning to undertake a study (Option 3) to explore changes to the body of the Part 50 regulations, to incorporate risk-informed attributes. These changes could involve such actions as developing a new set of design-basis accidents, adding provision to Part 50 allowing for risk-informed alternatives to the present requirements, revising specific requirements to reflect risk-informed considerations, or deleting unnecessary or ineffective regulations. After the completion of this study, the staff will make recommendations to the Commission on any specific regulatory changes that should be pursued, and the corresponding schedules and resource needs.

In addition, the staff has identified four policy issues for Commission consideration and guidance. Direction with respect to these issues would be needed to proceed with a risk-informed Part 50 program. The staff has recommended that: 1) Licensee conformance with a modified Part 50 should be voluntary rather than mandatory, 2) Industry pilot studies with selected exemptions to Part 50 should be utilized as part of the risk-informed development process, 3) The scope of the maintenance rule should be changed as an early part of the risk-informed program, and 4) The staff should develop clarification of its authority for applying risk-informed decision making in areas beyond those associated with licensee initiated risk-informed licensing actions.

BACKGROUND:

In 1995, the Commission published a Policy Statement on the Use of Probabilistic Risk Assessment (PRA). Since then, the staff has developed guidance on the use of risk information for reactor license amendments and is currently processing license amendment applications that use risk information as part of their technical justification. However, the fundamental reactor regulations remain largely deterministic. In addition, in recent meetings between the Commission and various stakeholders, the concern was expressed that the NRC is not placing enough emphasis on risk-informing its reactor requirements with the results of risk assessments. It is generally believed that our current reactor regulatory framework (based largely upon design-basis events rather than on core-damage-accident scenarios) results in sufficient safety regulation but in some cases also results in unnecessary regulatory burden. In its September 2, 1998, briefing to the Commission on the status of the PRA Implementation Plan, the staff discussed this issue with the Commission and proposed the development and assessment of various options for making requirements in 10 CFR Part 50 risk-informed. In a staff requirements memorandum dated September 14, 1998, the Commission asked the staff to present a set of options that contain an assessment of the implications of each option, and to also present resource impacts and the role pilot studies would play in the development of new or modified requirements.

In developing the options discussed below, the staff met with the public, the Nuclear Energy Institute (NEI), nuclear utilities, and other representatives of industrial groups on several occasions, including a 2-day public workshop[1], for the purpose of discussing the objectives of revising Part 50, different approaches for incorporating risk information into the regulations in Part 50, and issues that the staff should consider in evaluating the options for the Commission. These stakeholder activities produced significant information for developing the implementation options given below. A general consensus was also reached regarding the overall objectives of risk-informed modifications to Part 50. These include the following:

- Enhance safety by focusing NRC and licensee resources in areas commensurate with their importance to health and safety.

- Provide NRC with the framework to use risk information to take action in reactor regulatory matters.

- Allow use of risk information to provide flexibility in plant operation and design, which can result in burden reduction without compromising safety.

This paper discusses options and a phased approach for their implementation such that, when completed, the staff envisions that Part 50 would have the following characteristics:

- In concert with other NRC regulations, it would continue to provide reasonable assurance of adequate protection of public health and safety.

- It would contain requirements on specific attributes of nuclear power plant design and operations commensurate with their safety significance. This safety significance would be assessed using principles of risk-informed regulation including the following:

  - consistency with the defense-in-depth philosophy
  - maintenance of sufficient safety margins
  - consistency with the intent of the Safety Goal Policy Statement

- The requirements would be written in a manner that would accommodate the plant-specific nature of the safety significance of design and operational attributes.

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[1]The transcript of the 10/27-28/98 Public Workshop on Risk-Informing Part 50 are available on the NRC public website (http://www.nrc.gov).

At the NRC public homepage (www.nrc.gov),
Click on News & Info Icon
Click on Public Meetings
Click on Meeting Transcripts
Click on Public Meeting on Making 10 CFR Part 50 Risk-Informed
To read the transcript, choose and click on either of the two days

- It would provide a clear, consistent, and coherent set of requirements that would also facilitate consistency in treatment among the assessment, inspection and enforcement programs.
- It would provide a regulatory basis for all NRC reactor-related activities, including licensing, inspection, enforcement, and assessment.
- It would be performance-based to the extent practical.
- It would be practical to implement for both licensees and the NRC.

These characteristics reflect the long term holistic vision for a risk-informed Part 50.

DISCUSSION:

High-Level Options

As a result of our preliminary assessments and stakeholder activities, the staff has identified the following three options for risk-informed modifications of 10 CFR Part 50: (1) make no changes to current Part 50, (2) make changes to the overall scope of systems, structures, and components (SSCs) covered by those sections of Part 50 requiring special treatment (such as quality assurance, technical specifications, environmental qualification, and 50.59 by formulating new definitions of safety-related and important-to-safety SSCs)[2], and (3) make changes to specific requirements in the body of regulations, including general design criteria (GDCs). Options 2 and 3 could be implemented individually or in combination, since in many aspects they are complementary. The three options are discussed next.

Option 1. Make No Change to Current Part 50

This option would terminate staff action to develop comprehensive risk-informed changes to the current Part 50. Risk-informed approaches specified in Regulatory Guide (RG) 1.174, and associated application-specific RGs would continue to be implemented subject to existing regulatory limitations. One example of these limitations is in the area of graded quality assurance (GQA), where requirements other than those that govern QA (10 CFR 50.54 and Appendix B to Part 50 directly govern QA) limit the degree to which the risk informed process can be implemented. See Attachment 1 regarding the Graded QA implementation experiences at South Texas project (STP). This impediment could, if the Commission agrees, be eliminated by granting 10 CFR 50.12 exemptions on the basis of risk information. This approach, however, would be very resource intensive in the long term, assuming that many exemptions would be requested.

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[2]Changes to these definitions will have to be carefully assessed with respect to potential impact on the underlying definition of "basic component," which have specific requirement imposed as provided in Section 223.10 of the Atomic Energy Act. Modifying the treatment of safety-related and safety important SSCs without necessitating a change to the Atomic Energy Act would be desirable.

Under Option 1, ongoing Part 50 rulemaking activities, which have risk informed elements, would continue on their current schedules rather than be subsumed into an overall Part 50 revision process. These would include ongoing activities related to 50.65, 50.59, 50/72.50.73 and 50.55a as well as the revised source term rulemaking that will, if approved, create a new Section 50.67. Currently, the staff is going forward with each of these programs separately from the proposed Part 50 process.

Meetings with stakeholders have indicated the industry's desire that ongoing activities proceed on their current schedule, with the exception of the Maintenance Rule (10 CFR 50.65) rulemaking where the Nuclear Energy Institute (NEI) has indicated it will respond to proposed rulemaking with comments suggesting broader changes to the Rule's scope as part of current rulemaking. Discussions on various Maintenance Rule approaches, with associated advantages and disadvantages, are presented as a policy issue in a later section of this paper. The assessment of the advantages and disadvantages of risk-informing the Maintenance Rule (in Attachment 4) also addresses the possibility of developing more risk-informed guidance on application of the Maintenance Rule within the context of the existing rule without further modifications to the rule itself.

Ongoing rulemaking activities associated with 50.59 will provide increased clarity and implementation stability by defining a minimal (but non-zero) threshold for licensees to make changes to their facility without prior staff review and approval. The changes to the reporting requirements in 50.72 and 50.73 are intended to provide a better safety and risk focus to the reporting process and avoid unnecessary burden. The ongoing Inservice Inspection (ISI) code case endorsement process will incorporate staff guidance directly into the ASME code cases, allowing for more efficient implementation. The proposed 50.67 would enable operating reactors to voluntarily implement a more representative source term that would be used in assessing design-basis accident response against revised dose acceptance criteria. (A similar change in 50.34 in January 1997 enabled the use of revised source terms by applicants for Construction Permit, Combined Operating License, or Design Certification.) These alternative source terms reflect the release of fission products during design-basis accidents more accurately than does the current source term, making it possible for operating reactors to implement cost-beneficial plant modifications, thereby reducing unnecessary regulatory burden.

None of the ongoing revisions are anticipated to be inconsistent or incompatible with future Part 50 risk informed revisions. However the more extensive Part 50 revision process identified in Options 2 and 3 below, would likely identify additional refinements in some of the above regulations. For example, more specific risk-informed decision criteria may be developed for 50.59. Allowing these separate efforts to continue could necessitate revisiting some of the above regulations at a later date.

Option 2. <u>Make Changes to the Scope of Systems, Structures, and Components Covered by Those Sections of Part 50 Requiring Special Treatment</u>

The current scope of SSCs covered by most sections of Part 50 is based primarily on the evaluation of selected design-basis events, as described in final safety analysis reports (FSARs). These postulated events represent a small fraction of the potential accident sequences treated in risk assessments. As the primary part of this option, risk-informed

definitions of "safety-related" and "important to safety" could be developed. This would lead to changes in the scope of what receives special operational and qualification treatment.

This option only addresses implementing changes to the regulatory scope for SSCs needing special treatment in terms of quality (e.g., quality assurance, environmental qualification, Tech Specs, 50.59, ASME Code). It does not address changing the design of the plant or the design-basis accidents, which establishes the physical complement of plant systems included in the design. Under this option, SSCs of low safety significance (from a risk-informed assessment) would move from "special treatment" to normal industrial (sometimes called "commercial" treatment), but would remain in the plant and be expected to perform their design function but without additional margin, assurance or documentation associated with high safety significant SSCs.

As discussed in Option 1, one area that the industry has identified for early consideration of a revised regulatory scope is the Maintenance Rule (10 CFR 50.65). Revisions to the scope of this rule could be undertaken as part of Option 2 activities, or could be undertaken as part of the ongoing 50.65 rulemaking, which currently only address the 50.65(a)(3)/(a)(4) pre-maintenance safety assessment process. It should be noted however, that applying such changes would modify the original scope of the rule as intended by the Commission. A discussion on the intent and implications of the present Maintenance Rule scope is provided in Attachment 2. The question of whether the scope of the Maintenance Rule should be revised is discussed below as a Commission policy issue, as is consideration of alternative approaches that could reduce unnecessary burden without a rule revision.

Under implementation of Option 2, there could be extensive changes to treatment of SSCs, as those with low risk importance have their regulatory requirements reduced and others not currently regulated have requirements added. To prevent excessive industry and staff burden, it is essential that an efficient regulatory process be employed as part of any implementation process. That process should be structured to eliminate unnecessary prior staff review and approval as licensees implement the operational changes allowed by the changes in Part 50 scope. Therefore, as part of this option, the staff could place specific regulatory requirements in a revised Part 50 (and associated guidance in a regulatory guide) on what provisions and criteria should be utilized by licensees to implement these changes without having to submit them to the staff for prior review and approval. Since changes to requirements in the revised regulations would apply to those SSCs of low risk importance, it is anticipated that such an approach could be accomplished with no significant safety impact. However, as part of this process, the staff would have to ensure that the licensee had appropriate assessment and feedback programs in place to reflect SSC performance degradation back into the PRA and to modify SSC risk importance as necessary.

Additionally, in the time period before the Part 50 scope changes take final form, the staff believes that the current provisions of 50.12 would permit the Commission to approve regulatory exemptions that allow for early implementation of risk-informed reductions to operational and qualification requirements. An exemption to operational requirements that involve, in toto, no change or a decrease in risk could be granted pursuant to paragraph (a)(2)(iv) of Section 50.12. An exemption that involves an increase in risk could potentially be granted under paragraph (a)(2)(vi) if the Commission were able to find that quantitative risk

information was not considered in the establishment of the regulatory requirement which is the subject of the exemption. The rationale for granting an exemption under paragraph (a)(2)(vi) would be that quantitative risk information constitutes a "material circumstance" not considered when the regulation was adopted. The grant of limited exemptions to a limited number of plants for purposes of pilot testing does not pose any special problems but the repeated issuance of a large number of exemptions which, considered together, represent a fundamental alteration of the conceptual nature of the licensing basis, to more than a limited number of plants essentially constitutes a generic change to the regulatory requirements in Part 50. Such generic changes should be adopted through rulemaking, rather than the case-by-case approach inherent in the regulatory approach embodied in the issuance of exemptions. Similarly, the granting of a large number of exemptions to a single plant, should not be so extensive that the validity of the original license is called into question (i.e., grant wholesale exemptions to all GDC, and regulations for an extensive subset of SSCs.

Option 3. Changes to Specific Regulatory Requirements

Under this option, changes would be made to the body of the Part 50 regulations to include risk-informed attributes in the requirements. Approaches to revising the body of the regulations could include the following:

- adding provisions to Part 50 allowing the staff to approve risk-informed alternatives to current regulations,
- revising specific requirements to reflect risk-informed considerations,
- deleting unnecessary or ineffective regulations.

This approach could be as broad as a complete rewrite of 10 CFR Part 50, or it could be more limited in scope, focusing on the regulations that have the most significant potential for improving safety and efficiency and reducing unnecessary burden. A process that results in a comprehensive reassessment of the Part 50 requirements would offer the ability to develop a coherent risk-informed regulatory framework that can be propagated throughout the regulations. It is especially important that the process results in consistent requirements among the assessment, inspection, and enforcement programs. In addition to benefits to currently operating reactors, such a framework would be of benefit for future reactors, and potential impact on Part 52 should be considered in developing this option.

Changes to specific design provisions of the general design criteria (GDCs) in Appendix A to 10 CFR Part 50 or development of a revised set of design-basis events based upon risk significance are potential areas for action under this option. The changes envisioned under Option 3 would be necessary to accomplish the long term vision for a risk-informed Part 50 discussed earlier in this paper. Changes of this magnitude would involve extensive public comment and participation. Use of industry pilot programs would be helpful for selecting, prioritizing, and implementing such changes.

Assessment of Benefits/Impacts For Various Options

The staff has assessed each of the options for risk-informing Part 50 with respect to the following factors to determine the implications of pursuing them:

- potential for improving safety decisions and increasing public confidence
- potential for reducing unnecessary licensee and NRC burdens
- the anticipated complexity of changes
- NRC resources needed for putting changes in place
- licensee resources needed for putting changes in place
- calendar time for full implementation[3] (NRC and licensee)

These assessments are, for the most part, qualitative, although preliminary estimates or estimated ranges have been made for resources, burden reduction, and an implementation schedule. In addition, magnitudes of the impacts of the other factors have been judged in relative terms as either high, moderate, or low. The results of the staff's assessment are summarized below and presented in both a narrative and tabular form in Attachment 3.

RECOMMENDATIONS:

The staff recommends adopting a phased approach to making 10 CFR Part 50 more risk-informed by proceeding initially with Option 2. However, the staff acknowledges that the options developed here have not had the benefit of full internal and external stakeholder involvement and that additional discussions on the formulation of these issues and their costs and benefits are needed in the process of developing a rulemaking package for the Commission. A phased approach appears to be consistent with comments received from stakeholders and would allow for achieving meaningful benefits in the early stages, while additional study is conducted to identify where additional risk-informed insights can be factored into more extensive regulatory changes in later phases. The staff also recommends that the current rulemaking activities identified in Option 1 continue unimpeded.

The staff also recommends that pilot plants be solicited (1) to assist in the development of scope and definition changes to Part 50 and (2) to test proposed changes during the development and comment period. The staff seeks guidance from the Commission on whether the scope of the Maintenance Rule should be revised and included as an early part of Option 2 (see associated issue under "Policy Issues" below). With Commission approval (see associated issue under "Policy Issues" below), the staff would consider exemption requests from pilot plants related to risk-informed scope modifications for such operational and qualification requirements that could be justified by applying the guidelines of RG 1.174 or supplemental criteria developed as part of the rulemaking effort.

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[3]Full implementation means that all NRC and licensee actions needed to make the option become part of day-to-day operations have been completed. This includes rule changes, guidance documents, staff and licensee program and procedure changes and training.

The staff additionally recommends that Option 3 be studied further and that the industry and staff continue with such pilot programs as the NEI Whole Plant study, to identify specific requirements meriting change and possible risk-informed alternatives to the body of Part 50. At the conclusion of this study, the staff would make recommendations to the Commission on any specific regulatory changes that should be pursued and the corresponding schedules and resource needs. During this study phase, the staff would be receptive to identifying specific regulatory changes that provide very beneficial risk-informed enhancements. These could include identifying requirements that are not risk- or safety-effective (for deletion consideration) as well as identifying areas in which very well-focused revisions could significantly enhance safety and/or effectiveness. When such issues are identified, they will be brought to the Commission's attention on a priority basis along with staff recommendations for action.

POLICY ISSUES:

The policy issues for Commission consideration include the following:

(1) voluntary vs. mandatory conformance with modified 10 CFR Part 50,
(2) industry pilot studies with selected exemptions to Part 50,
(3) modification of scope of the Maintenance Rule,
(4) clarification of staff authority for applying risk-informed decision making.

An assessment of the advantages and disadvantages of these issues is discussed in detail in Attachment 4 to this paper.

In summary, (1) the staff recommends that risk-informed implementation of Part 50 should be voluntary for licensees; (2) the staff recommends allowing pilot plants to implement changes using exemptions, because it will provide a significant benefit to the process of developing risk-informed revisions to Part 50; (3) the staff recommends that the current rulemaking initiatives associated with paragraphs (a)(3)/(a)(4) of 50.65 continue and that the scope of the Maintenance Rule be revised to one that is risk-informed and that this activity be an early activity in support of the overall Part 50 revision process; and (4) the staff recommends that additional guidance be developed, such as in a regulatory guide, to provide clarification on staff authority for applying risk-informed processes in regulatory activities beyond risk-informed licensing actions.

IMPLEMENTATION ISSUES:

The modification of 10 CFR Part 50 to make it more risk-informed requires the resolution of a set of implementation issues as well as the policy issues identified previously in this paper. These implementation issues are described in Attachment 5, and are provided for the Commission's information at this time. Resolution of these issues will be addressed during the development of the rulemaking process.

REQUESTED COMMISSION ACTION:

The staff requests that the Commission (1) approve implementation of Option 2 (including additional early internal and external stakeholder discussion) with utilization of industry pilot

studies, and allow ongoing rulemaking actions identified in Option 1 to continue unimpeded; (2) note that the staff will initiate a study of Option 3; (3) approve the use of industry pilot studies involving the use of exemptions to assist in the development of the Part 50 modifications; (4) endorse using the Maintenance Rule (10 CFR 50.65) as part of the Option 2 effort, as an initial step in revising the scope to be risk-informed and to facilitate scope revisions being developed for other Part 50 operational requirements (Option 2); (5) approve work to develop regulatory guide or other staff guidance clarifying staff approaches for applying risk-informed decision making; and (6) provide guidance on the remaining policy issues discussed in Attachment 4.

After the Commission issues its guidance, the staff will develop another Commission paper (including a Rulemaking Activities Plan, as appropriate) to address in more detail a plan of action for implementing the guidance provided by the Commission.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objections. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections.

RESOURCES:

On the basis of experience with developing such programs as standard technical specifications, Maintenance Rule, and risk-informed regulatory guidance, the staff has made some preliminary estimates of NRC resources needed to implement the various options. These estimates, which the staff believes are the best possible at this point in time, are shown in Attachment 3. Also provided are preliminary estimates of the potential benefits from the various options with respect to decision making and burden reduction. Although these estimates vary among options, in all cases they are considered substantial in an environment of declining resources. Current Operating Plan budgets for FY 1999 and FY 2000 do not reflect the resources (dollars or FTE) needed to pursue Options 2 or 3 or the study of Option 3. Therefore, implementing these options would necessitate reprogramming resources from other activities from within the NRR and RES budgets. More specifically, this would have implications for the NRR operating plan and budget for undertaking rulemaking and review of exemptions, and the RES operating plan and budget for support of the development of technical bases and study of Option 3 alternatives. The staff proposes to make more refined resource estimates and identify adjustments in office operating plans after receiving guidance and direction from the Commission regarding specific options. The staff's initial judgment is that the resource

requirements for the recommended options could be accommodated without compromising the high priority issues of risk-informed licensing actions and risk-informing the inspection, assessment and enforcement processes.

William D. Travers
Executive Director
for Operations

Attachments:
1. Insights From Graded Quality Assurance Implementation at South Texas
2. Supplementary Information on Maintenance Rule Scope
3. Preliminary Assessment of Impacts of Various Options for Risk-Informing Part 50
4. Discussion of Policy Issues

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Commissioners' completed vote sheets/comments should be provided directly to the Office of the Secretary by c.o.b. Tuesday, January 19, 1999.

Commission staff office comments, if any, should be submitted to the Commissioners NLT Tuesday, January 12, 1999, with an information copy to SECY. If the paper is of such a nature that it requires additional review and comment, the Commissioners and the Secretariat should be apprised of when comments may be expected.

INSIGHTS FROM GRADED QUALITY ASSURANCE IMPLEMENTATION AT SOUTH TEXAS PROJECT (STP)

In March 1996, the STP licensee asked NRC to approve a revised Operations Quality Assurance Program (OQAP) for STP, incorporating the methodology for graded quality assurance (QA), which was also based on probabilistic safety assessment (PSA) risk insights. Following extensive discussions with the licensee and substantial review, the staff approved the proposed revision to the OQAP by letter dated November 6, 1997. In its letter and accompanying safety evaluation, the staff concluded that the licensee's methodology for determining the relative safety significance of plant structures, systems, and components (SSCs) was acceptable; that appropriate QA controls had been defined for the established categories of SSCs; that adequate feedback mechanisms had been established to adjust the graded QA program if operational performance indicated such a need; and that all pertinent regulatory requirements continued to be satisfied.

Subsequent to NRC approval, the licensee has identified implementation difficulties associated with the graded QA program. For a number of low-risk-significant SSCs, for which the licensee has reduced the QA requirement, other regulatory requirements such as environmental qualification and American Society of Mechanical Engineers Code seismic requirements continue to impose substantial requirements. This has prevented the licensee from reducing additional burdens on these SSCs that have low importance.

The licensee has indicated its desire to solicit additional regulatory relief, to achieve its originally envisioned graded QA program benefits. As discussed with the staff at several meetings, the licensee would propose exemptions to 10 CFR 50.2 and 10 CFR 50.59, so that some components currently considered as "safety-related" or "important to safety" could be reclassified as non-risk-significant and low-risk-significant components, consistent with the NRC-approved graded QA process. This STP initiative could reduce the complexity and resources required for routine maintenance and replacement for specifically identified systems or components by removing them from the scope of specific regulations, such as those governing seismic and other qualification requirements. Commission approval of the policy issue allowing risk-informed exemptions would clarify the staff's ability to proceed with this pilot.

SUPPLEMENTARY INFORMATION ON MAINTENANCE RULE SCOPE

Scope Issues Related to Risk-Informing the Maintenance Rule

The staff has received comments from the Nuclear Energy Institute (NEI) that the industry intends to propose narrowing the Maintenance Rule (10 CFR 50.65) scope as part of the current Maintenance Rule revision.[4] It should be noted that the scope of the Maintenance Rule was intentionally broader than the scope of other regulations. In 1991, when the rule was written, the Commission specifically included non-safety-related structures, systems, and components (SSCs) in order to apply the NRC's authority to take action against poor maintenance practices in the balance of plant. The purpose of the Maintenance Rule is to "provide reasonable assurance that (1) intended safety, accident mitigation, and transient mitigation functions of the SSCs [in scope via (b)(1) and (b)(2)(I)] can be performed, and (2) failure of SSCs [in scope via (b)(2)(ii) and (b)(iii)] will not occur which prevent the fulfillment of safety-related functions, and failures resulting in scrams and unnecessary actuation of safety-related systems are **minimized**." The staff's current thinking on a risk-informed Part 50 is in conflict with the present scope of the Maintenance Rule, in that SSCs whose failures could result in transients and scrams are currently captured but would not necessarily be captured by a risk-informed scope. Also, equipment that is used to mitigate accidents and transients as well as equipment whose failure could prevent a safety-related SSC from fulfilling its intended function would not necessarily (dependent on their risk importance) remain in a risk-informed scope. Since risk-informing Part 50, including the Maintenance Rule, would change a previous Commission policy, a related policy issue has been included in the "Policy Issues" section of this paper. This policy issue addresses whether a scope change on the Maintenance Rule should be implemented, and possible alternatives to a rule change that offer potential reductions in implementation burden.

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[4]The current rulemaking is limited to the safety assessment (a)(3) recommendation; a separate proposed rule change (including scope revisions) would have to be issued for public comment.

PRELIMINARY ASSESSMENT OF IMPACTS OF VARIOUS OPTIONS FOR RISK-INFORMING PART 50

	Option 2 **Change Scope of SSCs Requiring Special Treatment**	**Option 3** **Change Specific Safety Requirements**
Improved safety decisions and public confidence	High	Moderate to High
Implementation costs NRC[5]	25 to 50 NRR FTE over 4 to 8 years; NRR tech. assistance $250K/yr 2 to 3 Research FTE and 500K/yr for approximately 2 to 3 years	100 RES/NRR FTE over not less than 5 years; RES tech. assistance of $1 million/yr[6]
Implementation costs licensees	High	High
Burden reduction NRC	Moderate[7]	Less than Option 2 but dependent upon specific changes implemented
Burden reduction licensees	Very High[8]	Potentially high
Complexity	Moderately high	High
Time to full implementation	4 to 8 years	Not less than 5 years after completion of Option 3 study

[5]Estimated direct FTE assuming that all policy issue recommendations are endorsed by the Commission. Industry implementation being mandatory or voluntary (i.e., policy Option 1) would not appreciably affect these estimates.

[6]Preliminary estimates for full Option 3 implementation, including rulemaking. Resources to conduct the study of Option 3 are in addition to the full implementation costs and are estimated to be approximately 5 RES/NRR FTE spread over 2-3 years, and RES technical assistance of $500k/yr.

[7]Once fully implemented, this option is estimated to result in increased staff efficiencies in the area of licensing reviews, inspection and enforcement to correspond to a net reduction in staffing levels of approximately 10-20 direct FTE per year.

[8]Reduction of 1 to 10 % of current operations and maintenance (O&M) cost assumed (~$100 million to 1 billion/year).

Assessment of the Implications of Pursuing Various Options

The staff has made a very preliminary assessment of each of the options for risk-informing Part 50 with respect to the following factors to determine the implications of pursuing them:

- potential for improving safety decisions
- potential for reducing unnecessary licensee and NRC burdens
- the anticipated complexity of changes
- licensee and NRC resources needed for putting changes in place
- calendar time for full implementation[9] (licensee and NRC)

Although the assessments are, for the most part qualitative, some preliminary estimates have been made for NRC resources, burden reduction on the part of NRC and licensees, and the schedules for implementation. In addition, magnitudes of the impacts of the other factors have been judged in relative terms as either very high, high or moderate, or low.

The results of the staff's assessment are discussed below and summarized in the table on the preceding page.

Option 2. Changing the Scope of SSCs Requiring Special Treatment

Changing the scope of SSC operational and qualification treatment requirements to be risk-informed would lead to better safety decisions in one of the most important areas with respect to safety at nuclear power plants-plant operations. Indeed, operating experience, research, and analyses of severe accidents have shown plant designs to be generally robust; also, with the completion of the individual plant examinations, plant-specific design vulnerabilities have been addressed. Consequently, the risk at plant sites is controlled on a day-to-day basis by decisions pertaining to operations. For this reason, the staff believes that this option would have the highest safety impact with respect to the regulatory decision making process, as well as offering the greatest potential for reducing unnecessary burden.

Changing the scope of operational and qualification treatment involves fundamental changes to a significant number of diverse requirements that would lead to many changes in procedures and practices for the licensees and NRC. Because of this, the staff believes that NRC and its licensees would face a significant number of complex issues in implementing this option. Along with resolving difficult issues, significant effort by both the NRC and licensees would be required to make changes to their respective "infrastructures" (e.g., procedures, training, regulatory guides) dictated by this option. Consequently, the staff expects that this option would require significant resource commitments from the NRC and licensees to develop and implement the option fully. The staff estimates 25 to 50 direct FTE expended over a 4-8 year period and $250K per year would be needed to implement this option. At the public workshop on risk-informing Part 50, industry representatives also expressed their expectation that this option could lead to significant reductions in operating costs (burden), especially when the changes lead to reductions in occupational exposure to radiation. The staff believes that a

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[9]Full implementation means all licensee and NRC actions needed to make the option become part of day-to-day operations have been completed.

1 percent to 10 percent reduction in current operations and maintenance (O&M) costs per plant per year following implementation of the option (≤$100 million to 1 billion/year for the entire population of operating plants) is a reasonable figure to use for the purpose of considering options. This estimate is consistent with the views of senior nuclear industry executives. In a November 10, 1998 e-mail to Annette L. Vietti-Cook, Mr. Harold B. Ray, Executive Vice President, Southern California Edison Company, submitted information in preparation of the planned November 13, 1998 Stakeholders meeting. In that e-mail, Mr. Ray stated in response, "In contrast, savings of at least 1 percent of annual O&M should certainly be achievable over the long term, and far more than this would be a reasonable goal. On another basis, only a few hours of avoided, market-based revenue loss per year, as a result of fully risk-informed regulation, would offset the assumed cost of plan implementation by any one unit. In our experience, this should certainly be achievable."

In regard to schedule, one licensee representative at the workshop who is a participant in the NEI Whole Plant initiative on Part 50 expressed his belief that this option could be fully implemented in approximately 5 years. Given the time it has taken to develop the Maintenance Rule and put it in place, and the lessons learned from Maintenance Rule implementation, the staff believes that a reasonable estimate is on the order of 4-8 years.

Option 3. Changes in Safety Requirements

Changes to safety requirements can vary substantially in cost and burden reduction, depending on the number of requirements being changed, the nature of each specific requirement being changed, and the complexity of the change being made to the regulation. Fundamental and far-reaching changes to cornerstone safety requirements such as 10 CFR 50.46 (emergency core cooling) or 10 CFR Part 50, Appendix A (General Design Criteria) would have a cost and schedule much higher than that associated with changes that simply permit licensees to propose an alternative risk-informed method for satisfying an existing Part 50 requirement. Resources needed on the part of the NRC and licensees to make substantive changes to safety requirements are expected to be large. In many cases such changes would include changes in codes, standards, NRC regulatory guides, NRC standard review plans, FSARs, and design-basis documents that implement the requirements in Part 50. For this reason, the staff believes this option would be the most difficult, most expensive, most time-consuming (no fewer than 5 years) to implement. The staff's preliminary estimate for NRC resources needed to implement this option is a total of 100 direct FTE with technical assistance of $1 million/yr. This estimate will be refined after the Option 3 study is finished. These are preliminary estimates for full Option 3 implementation, including rulemaking. The estimated resources to conduct the study of Option 3 are approximately 5 direct FTE spread over 2-3 years and technical assistance of $500k/yr.

Changes in safety requirements that eliminate the need for some systems, structures, and components, or that allow substantial flexibility in such areas as reactor fuel design, would lead to a reduction in the unnecessary burden to licensees. The staff estimates a reduction that could be potentially high, but that there is more uncertainty regarding the potential benefit, which will be dependent upon what rule revisions are actually implemented.

DISCUSSION OF POLICY ISSUES

The Commission is requested to provide guidance on the following policy issues in order to develop specific implementation approaches for the options discussed above. These include the following:

- voluntary vs. mandatory conformance with modified 10 CFR Part 50,
- industry pilot studies with selected exemptions to Part 50,
- modification of scope of the Maintenance Rule,
- clarification of staff authority for applying risk-informed decision making.

1. Mandatory versus Voluntary Implementation of Risk-informed Part 50

For any proposed risk-informed changes to Part 50, a fundamental policy question is whether all licensees would be required to implement the revised regulations, or whether the revised regulations would offer licensees an optional alternative set of requirements that each individual licensee can choose to adopt, (changes to the current Part 50) or not adopt (remain with the current Part 50). If the Commission directs that implementation of a risk-informed Part 50 modification be voluntary, a related policy question arises: can a licensee choose which elements of the revised Part 50 to follow, or does selection of the risk-informed track require utilization of the entire set of revised requirements.

Advantages of Mandatory Implementation

Requiring the mandatory implementation of a risk-informed Part 50 has a number of advantages. Regulatory clarity and stability would be enhanced since there would be a single set of regulatory requirements. The Commission's objective stated in the PRA Policy Statement, to increase use of PRA, would be furthered. The safety benefit and burden-reduction benefits of risk-informed regulation would be uniformly achieved throughout the industry as regulatory requirements would be more properly risk-focused. Problems inherent in having two classes of licensees, risk-informed and not risk-informed, would be avoided. The staff is currently committed to check on implementation of more than 500 safety enhancements identified by the IPE and IPEEE program and to consider the need for regulatory oversight of such safety enhancements to the extent that they meet the backfit rule. Under a mandatory, risk-informed program, important safety enhancements would receive appropriate regulatory oversight, reducing the need for staff IPE followup.

Disadvantages of Mandatory Implementation

Mandatory application of risk-informed changes to Part 50 could have a detrimental effect on the schedule, resources, and extent to which Part 50 could be risk-informed. This is because many in the nuclear industry oppose any mandatory application of risk-informed initiatives and would likely work to limit changes if they are mandatory. More fundamentally, it may be very difficult to show that the risk informed changes, in any form, either: (i) will result in a substantial increase in overall protection of the public health and safety or common defense and security, the initial backfit threshold finding; or (ii) are *necessary* for adequate protection. In the latter regard, it must be shown that the existing regulatory approach no longer provides reasonable assurance of adequate protection, such that mandatory imposition of the new regulatory scheme is necessary to provide such reasonable assurance. While there are several options

open to the Commission with respect to addressing the Backfit Rule, it is likely that the industry would oppose Commission adoption of any of those options.

Also, licensees that have limited in-house PRA capability, and who may not have anticipated using the optional risk-informed approaches of RG 1.174, will have to expend start-up resources to ensure that they have adequate technical capability and an adequate quality PRA to properly implement the revised regulatory framework. Licensees that have shorter remaining license periods or those that anticipate early decommissioning would have less time to gain the benefits from a reduced regulatory burden. Also, the implications for those plants currently seeking license renewal would need to be determined.

Finally, current requirements have led to plants that are judged safe. Mandatory application of sweeping changes to Part 50 could send a signal that current plants are less safe than desired. If the risk-informed changes to Part 50 do represent an improvement, the staff expects that licensees would eventually change voluntarily.

If the Commission does direct the staff to proceed with risk-informed Part 50 revisions on a voluntary basis as the chosen option, the policy issue that remains is whether licensees that wish to use risk-informed options can implement selected elements, or whether they should employ the entire complement of risk-informed regulatory requirements. For example, could a licensee reduce quality assurance (QA), operational requirements, and equipment qualification requirements (EQ, and code class) on low risk important SSCs in the emergency ac power system, even though risk-important elements in non-safety-related gas turbine generators or startup feedpumps are not identified for additional attention?

This approach would allow licensees to be selective about what systems or programs are targeted for risk-informed implementation, thereby reducing implementation costs, and possibly allowing for earlier implementation, but in a more limited scope. However, partial implementation, sometimes known as "cherry picking" would tend to reduce burden in areas that are over regulated, but without the commensurate benefit of additional quality or performance requirements where SSC risk importance has not been fully recognized by the current regulatory framework. Such selective implementation is not compatible with the intent of risk-informed regulation.

Staff Recommendation

The staff recommends that implementation be voluntary, but that selective implementation not be allowed.

2. Industry Pilot Studies With Selected Exemptions to Part 50 in Advance of Rulemaking

The rulemaking process associated with a structured phased approach to risk-informing Part 50 would likely require several years before significant changes are issued. As the staff develops proposed regulatory revisions and works with pilot participants, the policy question arises as to whether pilot plant licensees may implement risk-informed alternatives through exemptions.

Advantages of Industry Pilot Studies With Exemptions

Industry pilot programs would be a very useful vehicle to develop and test approaches for risk-informed revisions to our regulatory requirements. They also would offer the opportunity to explore the detailed impact on design and operational requirements. Allowing exemptions in advance of final rulemaking would offer an incentive for industry pilot participants to justify the resource costs of pilot cooperation. This would serve to increase the potential pool of risk-informed pilot programs, which would benefit the risk-informing process. Even without formal pilot programs, stating the Commission's receptiveness to risk-informed exemption requests would demonstrate the agency's commitment to be forward-looking in allowing appropriate use of risk-informed approaches in the most timely manner. Additionally, Commission endorsement of this approach would clarify the ability of the staff to respond to the South Texas Project initiatives for resolving problems associated with Graded QA implementation (discussed in Attachment 1).

Disadvantages of Industry Pilot Studies With Exemptions

Since the rulemaking process would not have been fully completed when some exemptions would be issued, there is a possibility that details of a licensee risk-informed implementation might not be identical with the final rule. However, once the rulemaking process is completed, the pilot plants could be required to comply with the final rule(s) if the exemptions authorizing each plant's pilot approach include a provision requiring the plants to comply with the requirements in the final rulemaking(s).

Staff Recommendation

The staff recommends that industry pilot programs be undertaken in all appropriate areas including, but not limited to, the Maintenance Rule scope (see policy issue #3 below) and NEI Whole Plant study, and that exemptions be granted to pilot participants in cases in which the staff has determined that adequate risk-informed bases have been provided and the provisions of 10 CFR 50.12 are met.

3. Modification of Scope of the Maintenance Rule

As discussed in Attachment 2, the intent of the Maintenance Rule was that licensee's maintenance of important SSCs is effective to assure the functional capability of a broad range of plant SSCs and to reduce (or minimize) safety challenges such as reactor scrams. If the scope of the Maintenance Rule were to be modified in a risk-informed manner, much of the current scope could be eliminated since many of the SSCs currently monitored have little impact on core damage frequency or large early release frequency. One of the proposed risk-informed assessment program cornerstones includes all plant scrams regardless of their safety significance. The impact of modifying the rule on the regulatory basis for inspection and enforcement related to those initiators should be carefully assessed and considered. Modifying the scope of the Maintenance Rule could also impact the implementation of the license renewal rules in 10 CFR Part 54. If the Commission directs the staff to modify the scope of the Maintenance Rule, the remaining issue is: should the present rulemaking (requiring assessment prior to taking equipment out of service for maintenance) continue on its present schedule, or should this rulemaking be suspended, and its content included in a later

rulemaking package which includes the scope changes. As an alternative for rulemaking to revise the scope of 10 CFR 50.65, the staff could revise its guidance to reduce the scope of non-safety-related SSCs and the implementation requirements for SSCs that are of low risk importance.

Advantages of Revising Maintenance Rule Scope

Modifying the scope of the Maintenance Rule along with other regulations to be risk-informed would result in a coherent and consistent scope of all operation-related requirements. In addition, the overall intent of risk-informing the regulations (i.e., to better focus NRC and licensee resources on issues commensurate with safety) would be better served. Having a common scope of all operationally oriented rules would also contribute to improved clarity and communications. The inspection and enforcement programs are clear areas that would benefit from a reduced Maintenance Rule scope by more closely focusing on risk-significant SSCs and activities. Additionally, risk-informing the scope of the Maintenance Rule could relieve licensee burden without significantly affecting plant safety. The process would also provide the staff and industry with an excellent pilot activity that could serve as a basis for scope development for other rule revisions.

If the Commission does direct the staff to implement a revised scope to the Maintenance Rule, the remaining policy question is whether the current rulemaking should continue and the scope changes be conducted as an early part of Option 2, or should current 50.65 rulemaking be suspended and the proposed (a)(3)/(a)(4) changes be incorporated into a single rulemaking which includes the scope revisions.

The advantage of continuing with the current rulemaking is that it allows for earlier implementation of the requirement for licensees to assess the safety impact of taking equipment out of service for maintenance, which is voluntary in the existing rule.

The disadvantage of continuing with the current rulemaking activities is that it will necessitate two separate rulemakings, one dealing with the assessment requirement and a later effort directed towards the scope change. This would likely result in a small overall increase in staff resources, versus a single rulemaking effort that included both elements.

Disadvantages of Revising Maintenance Rule Scope

Modifying the scope of the Maintenance Rule would eliminate one mechanism for getting early predictive information on licensees' performance and on equipment reliability and availability; therefore, such scope changes would have to be assessed relative to their impact on the reactor assessment process currently under development to ensure design consistency. Also, the Commission's longstanding desire to reduce challenges, such as reactor scrams, could be eroded to some extent, especially as related to performance of balance-of-plant (BOP) systems.

The Maintenance Rule was credited (along with the entire regulatory process) in establishing the scope and objective of the license renewal rule in 10 CFR Part 54. Prior to changing the scope of the Maintenance Rule, the potential impact of the proposed changes on license renewal must be carefully considered.

If the Commission directs the staff not to revise the scope of the Maintenance Rule to be risk-informed, the remaining policy question is whether revised guidance should be issued to remove some less risk significant non-safety-related SSCs from scope and to allow less monitoring and assessment for those in-scope low risk standby SSCs which are of low risk importance. A revised regulatory guide could be developed which outlines such reductions in implementation burden for low importance SSCs.

The advantages of issuing such guidance is that it would provide some amount of burden reduction for licensees on an expedited basis, without requiring the staff resources necessary to conduct additional rulemaking on 10 CFR 50.65.

The disadvantage of utilizing regulatory guidance documents, rather than a rule change, is that some monitoring and assessment burden would still remain on low risk importance SSCs due to the current scope definition in the rule. Therefore, this approach would only partially improve the risk-informed focus of the Maintenance Rule.

Staff Recommendation

The staff recommends that the present rulemaking effort on 10 CFR 50.65 continue unimpeded. The staff also recommends that the scope of the Maintenance Rule be revised to be risk-informed and that this effort be conducted in an early stage of Option 2 implementation. If the Commission directs the staff not to revise the scope of the Maintenance Rule, then the staff recommends that implementation guidance be revised to reduce the monitoring and assessment requirements on low risk important SSCs.

4. Clarification of Staff Authority for Applying Risk-Informed Decision making

Commission guidance presented in the final risk-informed regulatory guidance e.g., RG 1.174 and standard review plans, documents the process and criteria for licensees to use in justifying licensee-initiated (voluntary) risk-informed licensing actions. Although the Commission's 1995 PRA Policy Statement indicated that the staff should increase the use of PRA in its regulatory activities, no specific requirement exists for licensees to perform risk analyses in support of licensing actions.

Advantages of Clarification of Staff Authority

This action would clarify the staff's authority to question the risk implications of, and potentially reject proposed changes to, the license or licensing basis for specific instances where risk considerations indicate the change would be unacceptable, (i.e., would not ensure adequate protection). This guidance would specifically state the staff's responsibilities to consider risk in regulatory decision making where the staff has information that leads it to question whether there is adequate protection. Section 182.a of the Atomic Energy Act of 1954, as amended (AEA) provides the NRC the authority to require the submission of information in connection with a license application (including an application for a license amendment) and this includes requesting risk information where NRC has reason to question adequate protection in a specific case. In cases where the risk information raises a concern with respect to adequate protection, the Commission could deny the application or condition its approval upon a showing that the applicant has addressed the risk information such that there is reasonable assurance of

adequate protection. However, if the risk information does not raise a concern with respect to adequate protection, then the Commission could: grant the license subject to conditions or requirements beyond those required in the Commission's regulations if a backfit analysis pursuant to 10 CFR 50.109 were performed to demonstrate that the additional conditions or requirements represent a substantial increase in protection of public health and safety whose costs are justified in view of the increased level of protection. In either case, however, the NRC bears the burden of demonstrating that the additional conditions and requirements are justified.

Therefore, additional direct authority does not need to be stated in Part 50 itself. However, to provide clarity and consistency, additional guidance in such supporting documents as a regulatory guide could be established to assist the staff in identifying circumstances in which the relationship between meeting the regulation and demonstrating adequate protection should be further explored. The staff would utilize such guidance in deciding "if undue risk exists" (i.e., there is no adequate protection), even when all other regulatory requirements appear to be satisfied.

Disadvantages of Clarification of Staff Authority

Issuing staff guidance, rather than undertaking a rulemaking, to clarify the responsibility of the staff to apply risk-informed concepts in regulatory activities would rely upon our regulatory authority to take appropriate action whenever adequate protection is called into question. Absent rulemaking severe accident risk will be considered only in those instances where the staff believes adequate protection may be in question, or the backfit provisions of 50.109 can be satisfied. This sets a high threshold that the staff must achieve in pursuing severe-accident issues with licensees, who are not in the process of supporting risk-informed licensing actions. Pursuing the clarification approach discussed above would put the additional burden on the staff to demonstrate lack of adequate protection, where the staff would wish to take regulatory action based upon risk insights.

Staff Recommendation

The staff recommends that the Commission approve development of clarification guidance with respect to the staff's authority to use risk-informed approaches in appropriate regulatory activities. However, should the Commission decide to initiate rulemaking to go further and require licensees to consider severe accident risk in all licensing activities, the staff recommends that this issue be included into the scope of Option 3 for further study.

IMPLEMENTATION ISSUES FOR RISK-INFORMING 10 CFR PART 50

Issue	Description
Metrics and acceptance guidelines	What metrics are needed for the traditional engineering and risk parts of specific risk-informed regulations? What are the associated acceptance guidelines? Should the categorization of SSCs with respect to safety importance be graded? How should currently "non-safety-related" SSCs that are risk-important be captured in the new categorization scheme?
Required NRC review and approval	What risk-informed decisions can be made by licensees without NRC advance review and approval? What decisions will require such advance approval?
PRA quality	What is the required scope, level of detail, and quality of risk information needed for using PRA to support decisions for specific regulations?
Required documentation	What documentation is needed on site and is submitted to NRC for plant design and operational changes made as a result of the modifications to Part 50? Should the PRA be required to be docketed? How do potential changes to Part 50 to make it more risk-informed affect the ongoing process to make FSAR updates risk-informed?
Conforming regulatory guide and standard review plan changes	What regulatory guides (RGs) and standard review plan (SRP) sections need to be modified to reflect changes to Part 50? Should these modifications be made in parallel with or subsequent to rule changes?
Integration with risk-informed oversight	How do changes to make the oversight process more risk-informed affect potential changes to Part 50? How do changes to Part 50 affect the oversight process?
Integration with ongoing rule changes	Which ongoing rule changes should be combined with potential rule changes to Part 50 to make it more risk-informed?

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December 18, 1998

Mr. William Hill
Office of the Secretary
United States Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: NRC COMMISSION MEETINGS IN JANUARY 1999

Dear Mr. Hill:

UCS is pleased to accept the offer extended in our recent telephone conversation to provide short presentations during NRC Commission meetings scheduled in January 1999. Specifically, we can provide comments during the January 11, 1999, meeting on risk-informed regulation and during the January 20, 1999, meeting on the inspection, enforcement, and assessment processes. We cannot provide comments during the January 13, 1999, meeting on reactor licensing initiatives.

I have enclosed a copy of a paper recently issued by UCS that deals with nuclear safety risks. This paper is the first in a planned three-part series on risk. The remaining two papers will examine specific case studies that illustrate the significant problems with plant risk assessments that must be addressed before risk-informed regulation can be successful.

Sincerely,

David A. Lochbaum
Nuclear Safety Engineer

enclosure: *Nuclear Plant Safety: Will the Luck Run Out?*

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Nuclear Plant Safety: Will the Luck Run Out?

The twentieth anniversary of the worst nuclear power plant accident in the United States is approaching. On March 22, 1979, the reactor core at the Three Mile Island Unit 2 facility outside Harrisburg, Pennsylvania suffered a partial meltdown when a minor plant incident was complicated by equipment failures and personnel errors. According to surveys conducted by the Pennsylvania Department of Health, approximately 144,000 people living within 15 miles of the plant evacuated the area during the crisis. Nearby schools were closed for a week after the accident. Lethal levels of radiation prevented plant workers from entering the reactor containment building for nearly a year. The severely damaged facility never resumed operating and cost several hundred million dollars to clean up.

Although several nuclear plants have unexpectedly released radioactive gas or liquid to the environment and others have suffered incidents that required costly repairs, no other event in this country has approached the severity of the Three Mile Island (TMI) disaster. Some people suggest that this means the nuclear industry has fully captured the lessons learned at TMI. But closer examination of the available data reveals that even though many substantive improvements have been made in nuclear plant safety, luck is still playing a large role in protecting public health and safety.

The TMI accident began when workers making adjustments to a water purification system inadvertently stopped the cooling flow for the reactor core. The backup equipment installed specifically to cope with this situation failed. Emergency pumps designed to protect the reactor core automatically started, but the operators shut them down. They mistakenly relied on a broken instrument gauge and failed to look at a backup gauge that showed the emergency pumps were needed. The reactor core overheated, partially melted, and released more than ten million curies of radioactivity into the atmosphere.

According to the Nuclear Regulatory Commission (NRC), over the past decade US nuclear plants have reported more than 200 events very much like the one that triggered the TMI accident. The cooling water for the reactor core was unexpectedly lost in each of these events. In addition, there have been numerous other events caused by fires, pipe ruptures, and power failures. Yet none of these events led to reactor core meltdown. Why not? These events were not complicated by faulty backup equipment and worker errors as at TMI. Thus, the plants' design and operation limited these events to minor consequences. TMI was not the only potentially serious initiating event experienced by the US nuclear industry. It was simply the only such event that led to an accident.

One of the ingredients for an accident is faulty backup equipment. In recent years, the NRC and nuclear plant owners have reported several hundred instances where backup equipment was discovered to be faulty. A sampling:

- The NRC reported in July 1996 that the Haddam Neck Nuclear Plant in Connecticut had operated for its entire 28-year lifetime with the piping that supplies water to the reactor core too small to allow the necessary amount of water. As at TMI, the fuel in Haddam Neck's reactor core was not properly protected from severe damage by overheating.

- Two years later, the owner of the Big Rock Point nuclear plant in Michigan discovered that the facility had operated during the final third of its 39-year lifetime with the piping that would have supplied a borated solution to the reactor core completely severed. This vital emergency system would have been unable to shut down the reactor had there been an accident during this 13-year period. The borated solution is the only backup system for shutting down the reactor core. If the

primary system failed, as it did at the Browns Ferry nuclear plant in 1980, the backup system would have been unable to stop the nuclear reaction.

- The owner of the Sequoyah Nuclear Plant reported in March 1992 that 27 of the 48 doors from the Unit 2 reactor containment building into the ice condenser would not freely open because water had gotten under the floor of the ice condenser and frozen, buckling the concrete upward several inches and blocking the doors. Further investigation revealed that 11 of the 48 ice condenser doors on Unit 1 were similarly affected. The ice condenser is a large vault containing over two million pounds of ice. The ice functions to absorb the energy released inside the reactor containment building when a pipe breaks. With so many ice condenser doors disabled, Sequoyah's reactor containment building could easily have been overpressurized and failed in event of an accident. The reactor containment building is the final barrier between radioactive material and the environment. If it failed, large amounts of radioactivity would have been released directly to the atmosphere.

- In November 1997, the NRC reported that its inspectors had found fibrous material inside the containment of the Donald C. Cook Nuclear Plant in Michigan. In case of an accident, this material may have clogged the debris screens that protect the emergency pumps. If these screens became clogged, as they did at the Perry Nuclear Power Plant in Ohio in March 1993 and the Limerick nuclear plant in Pennsylvania during September 1995, the emergency pumps would not have been able to supply necessary cooling water to the reactor core.

- In 1997, the owner of the Quad Cities nuclear plant in Illinois informed the NRC that a fire could cut off the power to <u>all</u> of the emergency pumps and cause serious reactor core damage. Following the disastrous fire at the Browns Ferry nuclear plant in March 1975, the NRC required all owners to modify their plants to ensure that a fire could not interrupt the power to both the primary emergency pumps and their backups. More than 22 years later, the Quad Cities plant was still vulnerable. It took the plant's owners nearly a year to re-route power cables and revise emergency procedures to remedy the problems.

None of these backup equipment failures led to reactor core meltdown. Why not? These plants did not experience an initiating event, which required the backup equipment to function. Safety was achieved by not challenging the equipment rather than by having the equipment successfully fulfill the required safety functions. In other words, luck.

The remaining ingredient for an accident is worker errors. The NRC reported 728 nuclear plant problems caused by worker mistakes during a recent two-year period. That's an average of more than three mistakes per year at each nuclear plant. The Union of Concerned Scientists monitored safety performance at ten nuclear plants during 1997. The data indicated that worker errors contributed to 35 percent of the safety problems reported at the average nuclear plant. The River Bend nuclear plant in Louisiana led the list with nearly 68 percent of its safety problems involving worker mistakes. None of these worker mistakes led to reactor core meltdown. Why not? These errors were not made in conjunction with an initiating event and faulty backup equipment. It was simply a matter of timing

The abundance of initiating events, equipment failures, and worker mistakes can be interpreted two ways. Some argue that this data demonstrates the success of the defense-in-depth approach to safety at US nuclear power plants. They maintain that backup system upon backup system and multiple barriers enable nuclear plants to tolerate problems without undue risk to the public. They suggest that the large number of reported problems shows the soundness of the defense-in-depth safety concept. They point to the fact that only one major reactor accident, Three Mile Island, has occurred in the US as the ultimate proof of the industry's safety record.

This data can also be interpreted in a more ominous way. At a casino, a jackpot occurs when three spinning wheels on a slot machine all stop in a certain combination. A nuclear power plant can be compared to a slot machine having an event wheel, an equipment wheel, and a worker performance wheel. Sometimes the event wheel stops on some initiating event such as "fire," "broken pipe," or "loss of power." Sometimes the equipment wheel stops on "failure." Sometimes the worker performance wheel stops on "mistake." At Three Mile Island, the wheels stopped on "loss of feedwater," "failure," and "mistake" to produce a major reactor accident. At Chernobyl, the wheels stopped on "loss of control," "failure," and "mistake" to produce another major reactor accident. Will there be another major reactor accident? The abundance of initiating events, equipment failures, and worker mistakes demonstrates that the wheels still stop frequently on these symbols. The TMI accident demonstrated that the wheels can line up for a major reactor accident.

Even the most adamant nuclear proponent must admit that a major reactor accident cannot be ruled out for the nuclear plants operating today. The key question is when will the next reactor accident occur? The NRC told the US Congress in April 1985 that:

> "The most complete and recent probabilistic risk assessments suggest core melt frequencies in the range of [one in one thousand] per reactor year to [one in ten thousand] per reactor year. A typical value is [three in ten thousand]. Were this the industry average, then in a population of 100 reactors operating over a period of 20 years, the crude cumulative probability of [a severe reactor] accident would be 45%."

With 103 reactors currently operating in the United States, these data suggest that a major reactor accident may be fairly likely to occur in the near future. It seems only a matter of time before the initiating event wheel, the equipment wheel, and the human performance wheel stop in a combination that produces another accident.

Why should anyone be concerned about preventing another reactor accident? After all, the TMI accident produced some dramatic headlines and prompted a *Saturday Night Live* skit, but it did not leave portions of the Pennsylvania countryside uninhabitable. If TMI represented the worst-case reactor accident, then it might be acceptable to suffer one such disaster every generation. Unfortunately, things can be much worse than TMI. A study prepared in 1982 by the Sandia National Laboratory concluded that an accident at the Limerick nuclear plant outside Philadelphia could kill 74,000 people within the first year and cause 34,000 subsequent cancer deaths. Another 610,000 people could experience radiation-related injuries such as cataracts, temporary sterility, and thyroid nodules. The study estimated that an accident at Limerick could cost $200 billion for lost wages, relocation expenses, and decontamination efforts. The calculated results from an accident at the other nuclear plants were not as severe, but they were still significant. The study provided ample reasons for doing all that can be done to prevent another reactor accident.

What must be done to protect the public? The NRC has to rigorously enforce federal safety regulations at all nuclear plants. For example, regulations require nuclear plant owners to have programs in place to minimize the occurrence of worker mistakes and to prevent their recurrence. The high rate of personnel errors at the River Bend nuclear plant, accounting for 68 percent of the reported problems at this facility during 1997, strongly suggests that these regulations are being violated. The NRC must strictly enforce the regulations at River Bend, and at all nuclear plants, to reduce the frequency of worker mistakes. These measures will reduce the chances that the human performance wheel stops on "mistake."

In addition, the NRC must establish objective criteria to determine when a nuclear power plant with declining performance must be shut down. During the past decade, many nuclear plants, including Salem, Millstone, Clinton, D C Cook, FitzPatrick, LaSalle, Crystal River, and Indian Point 3, have been shut down for more than a year while their owners corrected numerous safety problems. Some of these safety problems required extensive repairs to emergency equipment that had been broken or improperly

designed. At these plants, the equipment wheel was essentially permanently stuck on "failure." The NRC must take actions to limit the time that any plant's equipment wheel spends on "failure."

Nearly twenty years have passed since the reactor core meltdown at Three Mile Island. There have been thousands of similar initiating events, backup equipment failures, and worker mistakes in the intervening years. Fortune played a large role in preventing one or more of these initiating events from being complicated by faulty backup equipment and human errors to create another nuclear disaster. Unless actions are taken to reduce the frequency of equipment failures and worker mistakes, that era of good luck will run out. Unless these actions are taken soon, we should not bet on going another two decades without a major reactor accident.

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Virtually Reality: Problems with Risk-Informed Regulation

David Lochbaum

Nuclear Safety Engineer

dlochbaum@ucsusa.org

January 11, 1999

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Introduction

- Three issues must be resolved by NRC:
  - plant-specific risk assessments must account for, and stop ignoring, the reality of passive design problems
  - uncertainty "cushions" in plant-specific risk assessments must be properly controlled
  - the public must understand why the NRC would be more effective at risk-informed regulation than it has been at prescriptive regulation

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Passive Design Problems

- Emergency equipment may not function during an accident due to an operator's error, an active component failure, or a passive design problem.
  - Operator may close a valve or stop a pump, thus preventing required makeup or cooling flow.
  - Valve may not open due to motor or limit switch failure or pump may not start due to motor or control relay failure, thus preventing required makeup or cooling flow.
  - Piping may be severed (Big Rock Point) or system may be undersized (Haddam Neck and Maine Yankee), thus preventing required makeup or cooling flow.

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Passive Design Problems (continued)

- Plant-specific risk assessments account for chances of operator error and active component failures using database of actual industry experience.
  - Despite training, operators are assumed to make errors at the same rate as in the past.
  - Despite repairs, components are assumed to fail at the same rate as in the past.
- Plant-specific risk assessments do not account for chances of passive design problems even though comparable database of actual industry experience exists.
  - Passive design problems are assumed to be isolated, non-recurring events.

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Passive Design Problems (continued)

- Example of how passive design problems are being ignored by plant-specific risk assessments:
  - NUREG-1552 (1996) and its supplement (1998) document numerous, repetitive, recurring problems with fire barrier penetration seals including some that were not installed and others improperly installed.
  - Fire barrier penetration seals are assumed to be 100% effective in preventing a fire from propagating to an adjacent fire area, *although experience shows that there's a chance the seals may not even be installed.*

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Disparate Results

- A Boeing 737 aircraft with United painted on its side is <u>not</u> orders of magnitude safer or riskier than a Boeing 737 aircraft with Delta painted on it.
- A Westinghouse PWR operated by utility X can, on paper, appear to be much safer than an identical Westinghouse PWR operated by utility Y.

- Disparate results due to modeling "softness" enables actual risk increase from modification or procedure change to be hidden by tweaking some of the input constants.

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Public Perceptions

- NRC currently uses a prescriptive, rule-based system.
- In public's view, that system implies clearly defined lines between right and wrong.
- Despite "clearly defined lines," NRC allowed conditions at Millstone, Salem, D C Cook, et al to get so bad that repairs required multi-year outages.
- NRC is considering a performance-based, risk-informed (a.k.a "touchy-feely") system.
- In public's view, that system implies muddled lines and huge gray areas.
- Why should the public think, yet alone believe, that such a system will improve NRC's regulatory ability?

NEI

NUCLEAR ENERGY INSTITUTE

Ralph E. Beedle
SENIOR VICE PRESIDENT AND
CHIEF NUCLEAR OFFICER
NUCLEAR GENERATION

December 14, 1998

The Honorable Shirley Ann Jackson
Chairman
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Chairman Jackson:

Enclosed for your information are NEI's comments on the proposed rulemaking to the maintenance rule to address performance of configuration assessments prior to maintenance activities. As you know, industry has identified the maintenance rule as the priority regulation for NRC's efforts to provide risk-informed regulatory improvements. The enclosed comments discuss an approach that would provide a truly risk-informed maintenance rule in 1999 and establish a foundation for additional regulatory improvements.

We would appreciate the opportunity to brief the commission in this regard in early 1999. In the meantime, please contact me if you have any questions regarding our proposal for this rulemaking.

Sincerely,

Ralph E. Beedle

c: The Honorable Greta Joy Dicus, Commissioner, NRC
The Honorable Nils J. Diaz, Commissioner, NRC
The Honorable Edward McGaffigan, Jr., Commissioner, NRC
The Honorable Jeffrey S. Merrifield, Commissioner, NRC
Dr. William D. Travers, EDO/NRC

12/18...To EDO to Prepare Response for Chairman's Signature....Date due Comm: Jan 5...Cpy to: Chairman, RF, SECY to Ack, Bill Hill...98-1137
OCM#16074

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NEI

NUCLEAR ENERGY INSTITUTE

Anthony R. Pietrangelo
DIRECTOR LICENSING
NUCLEAR GENERATION

December 14, 1998

Mr. John C. Hoyle
Secretary of the Commission
Attention: Rulemakings and Adjudications Staff
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555-0001

SUBJECT: Industry Comments on Proposed Rulemaking to 10 CFR 50.65, Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants (63 *Fed. Reg.* 52201 – September 30, 1998)

The Nuclear Energy Institute[1] offers the following comments relative to the *Federal Register* notice which solicited public comments on a proposed revision to the Maintenance Rule. The proposed rulemaking seeks to:

1. Explicitly denote applicability of the rule to normal shutdown operations;

2. Change the current section (a)(3) recommendation for an assessment of equipment out of service to a regulatory requirement for an assessment of plant configuration prior to any maintenance activity; and

3. Require consideration of the above assessment result to ensure the plant is not placed in a risk-significant condition, or configurations that would degrade the performance of safety functions to an unacceptable level.

---

[1] NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including regulatory aspects of generic operational and technical issues. NEI members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

The industry comments on the proposed revision were developed with extensive input from NEI's Regulatory Process Working Group, Maintenance Rule Revision Task Force, and personnel charged with maintenance rule implementation at our member companies. We are sufficiently concerned about the potential impact of these proposed revisions that we believe the proposed rule should be withdrawn and renoticed following substantial additional discussion and modification. While the industry generally supports the Commission's intent in promulgating a revision to the rule, this rulemaking represents a significant new requirement that raises a number of concerns that should be addressed before proceeding. These concerns include the following:

1. How the rule would be implemented in light of the introduction of subjective new terminology into the body of regulations (e.g., "risk significant configuration" and "degrade performance...to an unacceptable level). Either a mutual understanding of these terms must be achieved, or an alternative that accomplishes the same objective must be developed;

2. The establishment of duplicative regulatory controls for plant structures, systems or components (SSCs) that already have configuration and operability requirements through Technical Specifications and how this duplication should be reconciled; and

3. The impractical scope of SSCs that would be subject to the proposed assessment requirement, and how the burden of the overall scope of SSCs in the maintenance rule could be reduced to achieve a risk-informed scope that would properly focus licensee and regulatory attention and resources.

The enclosure provides additional details on the concerns noted above.

Further, we believe that proceeding with this rule, absent a mutual understanding of its impact and implementation, will lead to programmatic inspection and enforcement issues. We note that NUREG-1622, *NRC Enforcement Policy Review*, recommended that the staff should develop draft guidance at the proposed rule stage so that the Commission can be satisfied that the staff's inspection and enforcement guidance is consistent with the Commission's intentions. In this case, the staff did not provide regulatory guidance on the new provisions in the proposed rule.

While we have significant issues with the proposed rule, we have nevertheless identified revision of the maintenance rule as an industry priority in coordination with NRC's efforts to risk-inform the Part 50 regulations. The subject rulemaking, if properly revised and renoticed, could serve as a catalyst that generates widespread industry interest and participation. In this regard, this is a unique opportunity to fulfill the original promise of the maintenance rule as a model for risk-informed, performance-based regulation. The industry stands ready to work with the NRC and other stakeholders to accomplish this goal without unduly delaying the rulemaking. We have formed a new industry executive group to oversee development of Part 50 regulatory reform, and to ensure the additional proposed improvements to the maintenance rule and implementation guidance can be effected in a rapid manner.

We look forward to further dialogue with the NRC on this important matter.

Sincerely,

Anthony R. Pietrangelo

Enclosure
REB/

c: Mr. Sam Collins, NRC/NRR
Mr. Ashok C, Thadani, NRC/RES
Mr. Stewart L. Magruder, Jr., NRC/NRR

Enclosure

Comments on Proposed Rulemaking to 10 CFR 50.65

Industry recognizes the importance of plant configuration control during power operations and normal shutdown operations, and generally supports the intent of this rulemaking. In fact, equipment out-of-service assessments are currently performed at all plants in view of the industry's treatment of the existing rule language as a requirement. As part of the basis for the rulemaking, the proposed rule points to prior NRC concerns with on-line maintenance and suggests that competitive pressures in a deregulated market could encourage additional on-line maintenance in order to shorten outage times. To present a more balanced picture, it would be appropriate to note that licensees currently take significant measures to control performance of on-line maintenance, and that many maintenance activities are more safely performed during power operation as opposed to outage conditions when redundant systems and other safety systems may be out-of-service. These positive factors should be discussed in the Statement of Considerations in order to present a balanced picture of how licensees responsibly control necessary maintenance activities. Work control processes generally include reviews by experienced engineering and operations personnel to assess the impact of taking equipment out of service for maintenance and to avoid unsafe plant configurations.

Better quantitative tools have been developed and utilized by licensees to control risk during maintenance activities. Tools currently in use include on-line risk monitors and risk matrices. It has also been recognized that licensees have substantially enhanced their configuration management controls.

Our understanding was that NRC's intent was to effect rulemaking that would codify the current industry practices that were found to be effective in the Maintenance Rule baseline inspections. However, we believe the proposed rule represents a substantial new requirement that lacks a mutually acceptable understanding, duplicates existing regulatory controls, and fails to address both the safety implications (in terms of diverting attention) and practicality that the current broad scope of the rule entails. In short, we believe the proposed rule should be revised and renoticed to address these concerns.

The following is a more detailed discussion of our primary concerns with the rule as well as additional comments on the rulemaking package and its importance to further regulatory improvement efforts.

Introduction of Subjective, Undefined Terminology

The proposed regulation would introduce significant new and undefined terminology ("ensure the plant is not placed in a risk significant configuration or configurations that would degrade performance of safety functions to an unacceptable level") directly into the rule language. The rulemaking cannot proceed until industry and NRC reach an understanding of these terms, and make appropriate revisions to the rule language to codify this understanding, or develop an alternative approach that accomplishes the same objective. (One possible alternative approach would be to use the wording developed by NRC for the "configuration risk management program" requirement, as discussed later in this letter.) Regardless of what implementation guidance is developed, the language of the rule itself must be clear in this regard. Otherwise, the rulemaking could lead to regulatory instability, unnecessary inspection and enforcement issues, or to informal establishment of regulatory expectations through the inspection process.

The recent implementation history of a number of important operational regulations, including the change process (10 CFR 50.59) and the maintenance rule (10 CFR 50.65) makes clear that explicit understanding of the actual rule language is of paramount importance in achieving stable and predictable implementation. Understandings of terms reached at the outset of implementation tend to evolve through the inspection process, resulting in costly and unstable implementation. An example is the evolution of maintenance rule scoping requirements through the inspection process, based on rule language referencing SSCs that "could cause a scram" or are referenced in emergency operating procedures. Many plants have scoped 10,000 to 15,000 SSCs into the rule. A properly constructed rule should be implemented one time in a clear manner, enabling consistent understanding over time.

We have worked with the NRC staff to develop revisions to the implementing guidance for the maintenance rule, NUMARC 93-01, that would address the subject rulemaking, and this important effort should be continued. However, the rule language itself must correspond to the final agreed-on form of the guidance. Further, the proposed implementation guidance should be made available for review concurrent with the rule comments period, to allow commenters to have a clear understanding of the intent and effect of the proposed rule.

Reconciliation with Existing, Duplicative Regulatory Controls

The proposed regulation would establish a duplicative regulatory regime for SSCs currently subject to Technical Specifications allowed outage time requirements. The establishment of dual regulatory controls has not been reconciled. In conjunction with this rulemaking, NRC should undertake conforming changes in the format and nature of Technical Specifications to reflect the establishment of this configuration assessment requirement in the regulations.

We note that NRC has imposed "configuration risk management program" (CRMP) requirements on a number of licensees as a condition of risk-informed improvements to Technical Specifications allowed outage time requirements. The intent of the CRMP is identical to that of the proposed maintenance rule revision, and the CRMP's continuation should not be necessary following promulgation of the final rule. NRC and industry efforts to establish the CRMP have elucidated a number of points that are germane to the proposed maintenance rule revision, including the following:

1. The scope of the CRMP assessment is properly limited to the maintenance rule high safety significant components or the scope of components modeled in the PRA.

2. The Technical Specification imposing the CRMP avoids the use of subjective terminology by imposing the following requirements for content and use of the CRMP:

   Provisions for performing an assessment prior to entering the LCO [Action Statement] [Condition] for preplanned activities

   Provisions for performing an assessment after entering the LCO [Action Statement] [Condition] for unplanned entry into the LCO [Action Statement] [Condition]

   Provisions for assessing the need for additional actions after the discovery of additional equipment out of service conditions while in the LCO [Action Statement] [Condition]

The CRMP wording places more emphasis on actions versus judgments. Given the identical intent, we would suggest consideration of similar wording in addressing use of the result of the (a)(4) configuration assessment.

Broad Scope Imposes Undue Burden on Monitoring and Assessment

The current scope of the maintenance rule is very broad and encompasses a large majority of the total SSCs in the plant. Many plants have over 10,000 SSCs within the scope of their maintenance rule programs (in some cases, over 75 percent of all SSCs within the plant have been determined to meet the scoping requirements.) Typical for most plants, only one-third of the total is identified as risk-significant, while the remainder is of low or no risk significance. Monitoring requirements are still imposed on the remaining SSCs.

The proposed rule would add to this burden by establishing a potentially counterproductive requirement in applying the assessment to the entire scope of maintenance rule structures, systems, or components, including those of low or no risk significance. Applying the assessment requirement to this scope is contrary to the spirit of risk-informed regulation, and does not reflect the current programs of many plants that have made substantial investments in risk management techniques, models, and tools to support the assessment.

The draft implementation guidance developed by industry recognizes the ability to perform the configuration assessment in a quantitative, qualitative, or blended manner, and that the degree of rigor and sophistication of the assessment should be a function of the safety significance of the proposed maintenance activity as it relates to the overall plant configuration. Therefore, the question of "risk significance" or "significant degradation" would need to be capable of being addressed in either a quantitative, qualitative, or blended manner. This is an area where further dialogue is needed to attain mutually acceptable guidance.

Definition of "Availability"

While not addressed directly in the rule language, the definition of "availability" in the implementation guidance will be key to this rulemaking. This definition provides the foundation for the determination of an SSC's role in defining the plant configuration, and, thus, its risk significance. A risk-informed definition of unavailability should consider the ability of the SSC to perform its intended safety function within the needed time frame. NRC's currently accepted definition of "availability" for the purposes of the maintenance rule is overly restrictive, and does not comport with the definition used to develop PRA models that typically support the assessment tools. A more realistic definition should be developed that considers the time to restore functionality with respect to the component's mission in risk-significant scenarios.

Regulatory Analysis and Backfit Determination

By separate letter, Maintenance Rule Inspection Clearinghouse (MRIC), an industry group formed by the legal firm of Winston and Strawn, provided detailed comments on the backfitting implications of the proposed rule and the draft regulatory analysis. We endorse their comments, which are summarized as follows:

1. The Regulatory Analysis does not fairly weigh the alternatives in that the disadvantages of the "no change" alternative are not realistically portrayed, including the premise that licensees might terminate their existing programs absent rulemaking.

2. The analysis of the safety benefit from the proposed rule is purely qualitative. The Regulatory Analysis does not attempt to provide any quantitative assessment of the expected safety benefit, but rather appears to conclude that it is infeasible to do so in view of the variability of risk assessment practices. In light of the potential significance of this rulemaking, a quantitative analysis should be performed. The backfitting rule, in 10 C.F.R. § 50.109(a)(3), requires a finding that a proposed backfit will produce a "substantial increase" in the overall protection of public health and safety.

3. The regulatory analysis is predicated on the rulemaking essentially codifying existing licensee programs. As previously noted, the rule would appear to establish significant new requirements that are not addressed in current licensee programs. Thus, we believe the regulatory analysis has substantially underestimated implementation costs. As acknowledged in the Regulatory Analysis § 4.0, the "NRC's Regulatory Analysis Guidelines direct the NRC Staff to not consider the cost of voluntary licensee actions as the cost basis for decisions concerning contemplated regulatory actions."

NRC's Part 50 Regulatory Reform Efforts

In light of the Commission's recent directive to transition to a more risk-informed regulatory approach, and given the implementation and inspection history of the maintenance rule, we believe the rulemaking should become the pilot rulemaking for the Part 50 reform effort. The rule should be renoticed with a corresponding change to risk-inform the scope of the maintenance rule as described in 10 CFR 50.65(b). Reconsideration of this rulemaking to address maintenance rule scope provides an outstanding opportunity to initiate NRC's effort to apply risk insights to the Part 50 regulations. This effort is supported by the Commission and the NRC staff has been charged to develop rulemaking plans. Industry presented the concept of using the

maintenance rule to pilot the Part 50 effort at an NRC stakeholder meeting held on October 27 and 28, 1998, and NRC has expressed general agreement with the industry approach (ACRS PRA subcommittee meeting of October 29, 1998, and full committee meeting of December 3, 1998). The basic elements of the proposed approach to apply risk insights to Part 50 are as follows:

- Undertake a phased rulemaking approach building on sequential steps, with the Maintenance Rule as the pilot rulemaking.

- Concentrate first on scope of structures, systems, and components (SSCs) subject to regulation by defining a category of "important to safety" using a combination of risk insights, operating experience, and engineering judgment (to address deterministic aspects, safety margins, defense in depth, and incompleteness of quantitative models). Use the maintenance rule revision to establish this definition, and apply this definition to establish the revised scope of the maintenance rule.

- Follow with rulemakings to apply the new definition to other regulations.

The maintenance rule provides an appropriate first application for the risk-informed Part 50 effort for a number of reasons:

- The rule is a backfitted monitoring rule, and transitioning to a risk-informed scope will not involve implicit effect on design basis issues, conformance with general design criteria, etc.

- The maintenance rule has been touted as a "risk informed performance based rule," however, baseline inspections have been programmatic and prescriptive. Inspection issues relative to scoping have nearly always involved components of little or no risk significance. With the proposed revision in scope, and the expected evolution to a performance based inspection approach, the rule could live up to its promise.

- The proposed codification of the configuration assessment requirement would be more clearly, consistently, and correctly implementable under a risk-informed scope.

- The rule already contains provisions for establishing a scope of equipment that covers design basis events, mitigation, initiating events, emergency operating procedures, and expert panel considerations. The implementation guidance further provides methods to characterize SSCs on the basis of risk insights. With some adjustments, this process could provide the foundation to achieve the scope of SSCs that would meet the "important to safety" approach as outlined above.

NRC Briefing on Risk-Informed Initiatives

January 11, 1999

Ralph Beedle

Steve Floyd

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NEI

NRC Rulemaking Plan

- General agreement with NRC staff suggested approach
  - Phased rulemaking process
  - Concentrate on scope issues
  - Use 50.12 for pilot plants
  - Voluntary implementation
  - Change scope of maintenance rule as early part of reform effort

NEI

Industry Support for Regulatory Reform

- NEI developing new executive working group with exclusive focus on risk-informed regulation
- Industry counterpart for NRC PRA Steering Committee
  - First meeting early 1999
  - Industry task forces will provide technical support

NEI

Industry Goals

- Work with NRC to:
  - Develop approach for defining "safety-significant" scope
  - Develop criteria for defining "risk significant configuration"
  - Use pilot plants to test approaches
  - Establish rule changes to codify new definitions

NEI

Maintenance Rule

- Strong industry support for risk-informed scope
  - Provides proper focus for monitoring and assessment requirements
  - Reflects assessment models and tools now in use
  - Generates widespread participation in risk-informed regulation

NEI

Concerns with Proposed Revision

- Scope issue not addressed
  - Makes assessment provision impractical
- Introduction of undefined terms
  - Risk-significant configuration
  - Degrade to … "unacceptable level"
- Reconciliation of new (a)(4) requirement with existing tech specs

NEI

Generic Concerns with Proposed Rulemaking

- Lack of due process
  - Unable to assess impact when key terms left undefined (compliance w/ 50.109?)
- Cannot assure proper intent and consistency without supporting guidance
- Undermines NRC efforts to provide stability and predictability

NEI

Conclusions

- NRC plan provides opportunity to significantly improve the safety focus of regulations
- Recent NRC approvals of risk-informed licensing actions are building confidence
- Industry views maintenance rule scope change as essential to overall success

NEI