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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
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ADVISORY COMMITTEE ON NUCLEAR WASTE

136th MEETING

+ + + + +
TUESDAY,
JULY 23, 2002

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ROCKVILLE, MARYLAND

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The ACNW met at the Nuclear Regulatory
Commission, Two White Flint North, Room T2B3, 11545
Rockville Pike, at 12:30 p.m, George M. Hornberger,
Chairman, presiding.

COMMITTEE MEMBERS:

GEORGE M. HORNBERGER, Chairman
RAYMOND G. WYMER, Vice Chairman
B. JOHN GARRICK, Member
MILTON N. LEVENSON, Member
MICHAEL T. RYAN, Member
MARTIN J. STEINDLER, Consultant

1 ACNW STAFF PRESENT:

2 JOHN T. LARKINS, Executive Director, ACRS/ACNW

3 SHER BAHADUR, Associate Director, ACRS/ACNW

4 ANDREW C. CAMPBELL

5 TIMOTHY KOBETZ

6 MICHAEL LEE

7 HOWARD J. LARSON

8 RICHARD K. MAJOR

9 RICHARD P. SAVIO

10

11 ALSO PRESENT:

12 ROD McCULLUM, NEI

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C-O-N-T-E-N-T-S

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 George Hornberger, Chairman

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

12:31 p.m.

CHAIRMAN HORNBERGER: The meeting will
come to order.

This is the first day of the 136th
meeting of the Advisory Committee on Nuclear Waste.
My name is George Hornberger, Chairman of the ACNW.
The other members of the Committee present are
Raymond Wymer, Vice Chairman. John Garrick, Milt
Levenson, and Michael Ryan are also participating in
today's session. Also, Marty Steindler is a
consultant for the Committee and he is participating
in today's meeting.

During today's meeting the Committee
will:

One, hear presentations from industry
and government representatives on the proposed Yucca
Mountain Review Plan and discuss elements of a
Committee letter report.

Two, discuss preparation of ACNW
reports.

John Larkins is the Designated Federal
Official for today's initial session.

This meeting is being conducted in
accordance with the provisions of the Federal

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1 Advisory Committee Act. We have received no
2 requests for time to make all statements from the
3 members of the public regarding today's sessions.
4 Should anyone wish to address the Committee, please
5 make your wishes known to one of the Committee's
6 staff.

7 It is requested that speakers use one of
8 the microphones, identify themselves, and speak with
9 sufficient clarity and volume so that they can be
10 readily heard.

11 Before proceeding, I would like to cover
12 some brief items of current interest. We welcome to
13 today's meeting Dr. Michael T. Ryan, who has been
14 appointed the fifth member of the ACNW. Welcome
15 officially, Michael.

16 The relevant Senate subcommittee has
17 approved the reappointment of Commissioner Jeffrey
18 Merrifield. However, the full Senate was unable to
19 take up his confirmation prior to the June 30th
20 expiration of his term. He is now doing a special
21 study for Chairman Meserve on the agency's public
22 relations policy.

23 The Committee notes the departure of Mr.
24 Mike Markley from the full-time office staff. Over
25 the past several years, while serving principally

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1 the ACRS, Mike has also been particularly helpful to
2 the ACNW on several projects, including serving as
3 the Designated Federal Official and Senior Staff
4 Engineer for the Joint ACRS/ACNW Committee. We wish
5 him well in his new assignment with IMNS, which the
6 last two letters must mean "Nuclear Safety," but --

7 DR. BAHADUR: Industrial and Medical --

8 CHAIRMAN HORNBERGER: Industrial and
9 Medical Nuclear Safety, IMNS.

10 They are the items of interest. We are
11 going to proceed to our agenda.

12 The main item on our agenda for this
13 afternoon is to discuss our comments on the Yucca
14 Mountain Review Plan, Revision 2. We are going to
15 start off hearing from Rod McCullum with the Nuclear
16 Energy Institute, who has some comments from NEI's
17 perspective on the WMRP. Rod?

18 MR. McCULLUM: Yes, I appreciate the
19 opportunity to come share our comments with the
20 Committee at the time you are considering yours.
21 What I will be talking about today is pretty much
22 our final draft comments. We had them all poised
23 and almost ready to go when the deadline was
24 extended. So, in keeping with the time-honored NEI
25 tradition of never submitting anything until the

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1 very last minute, we will hang on. In that vein,
2 any discussion or feedback from the Committee would
3 certainly be most appreciated.

4 We have taken a pretty significant look
5 at the Yucca Mountain Review Plan. It is something
6 we consider an important part of the process. I
7 have had industry experts from a number of our
8 member companies in licensing, quality assurance,
9 look at it with me, as well as the folks from EPRI,
10 from the scientific perspective.

11 Next slide. Of course, it goes without
12 saying how important Yucca Mountain is to the
13 industry. It is an important strategic objective
14 for us in terms of minimizing business uncertainties
15 at the back end of our fuel cycle, and it is to our
16 customers, too. I think the recent strong votes in
17 Congress on what was politically a very difficult
18 issue -- you had a very strong mandate coming out
19 there -- really show how people are customers, as
20 well as, of course, the folks inside the industry
21 appreciate the value of nuclear electricity and the
22 clean air benefits that it brings and understand
23 that this project is important to the continuance
24 and advancement of those things.

25 Of course, from the very beginning, in

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1 order for us to maximize or to realize the potential
2 of this project to our industry, the NRC's review of
3 the project is key, because, as the first sub-bullet
4 here says, it is not really that we have a place to
5 put the stuff that gives people confidence in
6 nuclear. It is that they are assured in the safety
7 of disposal. The NRC's review is a key component of
8 assuring the safety and providing confidence in the
9 safety of disposal.

10 It is also very important because,
11 again, as the President and the Secretary of Energy,
12 and a number of Members of the Congress
13 communicated, this is an urgent national priority,
14 that the process be constructed in a way that it
15 provides a workable framework for the project to
16 move forward. We have this incredible vote. We
17 should go strongly forward from there.

18 The Review Plan is at the very front end
19 of that. I was thinking the other day that, I think
20 it was in 1963, that President Kennedy told
21 Congress, "Let's put a man on the moon." Congress
22 agreed. In 1969, there was one standing there. Now
23 here we are in 2002; the President said, "Let's put
24 nuclear waste in Yucca Mountain," and Congress has
25 agreed. It is going to take until 2010.

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1 So I am not sure why it should take
2 longer, but when you look at difficult undertakings,
3 clearly, somebody had to make some very good
4 decisions at the very beginning. Having the right
5 regulatory framework, as defined by the Yucca
6 Mountain Review Plan, is certainly one of those
7 decisions.

8 Next slide. There are really two
9 aspects of the Review Plan. We feel that the
10 preponderance of our thinking is more positive than
11 negative, although I will certainly show you the
12 comments where there is room for improvement that
13 are most important in this review plan.

14 One is its risk-informed nature. We
15 found, as industry has evolved and progressed and
16 gotten better at safety, and improved performance at
17 the same time, that really risk-informed regulation
18 is a key part of that. We think there's even more
19 reasons to be risk-informed at Yucca Mountain, and I
20 will get into that in a little bit.

21 In fact, these two elements here are
22 both intrinsically related. Of course, the second
23 one is the stepwise approach, because it is
24 something we believe very strongly in, and it is
25 because there is a time component to risk. In

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1 reactor space, you make a decision to start a
2 reactor, and then if things go wrong, you have to
3 react very quickly.

4 In repository space, if things start to
5 go wrong on you, you have months, years, perhaps
6 decades, at least from the post-closure performance
7 standpoint, and most of our comments are in there.
8 So at the same time you have these lengths of time,
9 you also have progression of science. You will know
10 more in 2010 than you know today, and we should
11 certainly build the process to take advantage of
12 that, to license in steps as we go forward. So what
13 we were really looking for mainly in review was to
14 see that the Review Plan supported a risk-informed
15 approach as well as a stepwise approach.

16 Next slide. Of course, there are some
17 other areas we are interested in. I mentioned that
18 this is an important and urgent national priority.
19 It needs to be on the front end fairly quickly here,
20 and I think that it is good that NRC is moving
21 forward with the Review Plan. DOE is in the process
22 of preparing a license application right now.
23 Having the Review Plan finalized will help that
24 process.

25 The distinction between license review

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1 and inspection activities, there's been a lot of
2 pre-licensing review of DOE by NRC. This has been
3 down at a high level of detail, which is a good
4 thing. It has helped strengthen and prepare both
5 agencies to move forward.

6 There needs to be a caution, especially
7 in a stepwise approach, where the level of detail
8 will grade as you go further along, that the Review
9 Plan reflect what is a licensing review, recognizing
10 that, as the program moves forward, NRC will
11 continue to inspect and look at things in more
12 detail. So this is communicated in there very
13 effectively, and I will talk about that just a
14 little bit more.

15 The difference between reasonable
16 expectation and reasonable assurance, we feel there
17 is one, and it should be communicated in here. We
18 will have some specific comments on terminology,
19 clarifications, and the role of that pre-licensing
20 process.

21 Next slide. On the risk-informed side,
22 we feel that there is a strong commitment to the
23 risk-informed approach in the Review Plan. I did
24 not try to count the number of times the words
25 "risk-informed" were mentioned in there, but it was

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1 probably the most often-appearing word that you
2 would see in it.

3 But just saying you are risk-informed
4 doesn't always make you risk-informed in every
5 respect. So we do feel that there are some
6 improvements needed. I will discuss the specific
7 ones, but in general there needs to be a strong
8 upfront recognition that it is really up to the
9 licensee, DOE to propose, and NRC to approve, these
10 approaches, and the converse of that, a refraining,
11 if you will, from defining too much in advance in
12 the licensing review guidance what those are; less
13 detailed and prescriptiveness in some areas.

14 Again, this flexibility is very
15 important in stepwise licensing. We need a Review
16 Plan that appreciates that this process will evolve
17 and that, as you get to different steps, you will
18 know more. So being very prescriptive in the early
19 steps could inhibit that or at least mean you have
20 to keep revising the Review Plan quite frequently,
21 if you want to accomplish that.

22 Next slide. So we feel that in doing
23 this, there needs to be universal -- I started to
24 try to think of using the word "holistic," although
25 I am not sure that is appropriate here, but really a

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1 broad, comprehensive approach to risk-informing
2 this. Yet in the Review Plan, starting with Section
3 1.3, we see a lot of qualification, and I know this
4 slide is not very risk-informed because I run the
5 risk of hurting somebody's eyesight here, and not
6 informing anybody because you can't read it.

7 But the reason I have included or force-
8 fit all these quotes in here was "developing a risk-
9 informed," "the extent," "this area will be risk-
10 informed because," "where suitable," "will be risk-
11 informed there" -- it is almost like, well, we will
12 be risk-informed here because we have an excuse to
13 be over here or it is okay over there but not as
14 okay over here. That could lead to an uneven
15 review. It could lead to a situation where
16 different reviewers in different aspects of the
17 review might see the extent to which they are risk-
18 informed differently, and there would be not an
19 overall focus of, what are the most significant risk
20 contributors? Are we focusing most appropriately on
21 those? Are we focusing on them at the appropriate
22 steps in the process and in the appropriate detail
23 for that step of the process? It is less risk-
24 informing by exception, but risk-informing as a
25 rule, we would like to see in the Review Plan.

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1 Next slide. Three specific areas where
2 this is evident: Section 3, the General
3 Information, that review, the type of things that
4 were being asked for, I almost thought I was reading
5 the Review Plan, the details further deep into the
6 license application. It is simply the general
7 information and probably should pull back a little
8 bit there. It is just to make sure the summary
9 information is an adequate summary. It is not
10 really to test the information the way you would at
11 a further level of detail, either in a licensing
12 review or on into an inspection review.

13 Model abstraction, we noted that in each
14 of the 14 areas where you have the different types
15 of model abstraction they had a specific set of
16 guidance. There was an extreme amount of redundancy
17 in this. We do not feel that this is necessary;
18 that you could, in fact, save yourself 109, or maybe
19 90-some of 109, pages by simply having one set of
20 guidance applicable to model abstraction.

21 If there's needs to make exception, then
22 define by exception, well, why does it have to be
23 different for this type of model or why does it have
24 to be different for that type of model, as opposed
25 to the rule being that each type of model

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1 abstraction will have its very own comprehensive,
2 detailed description of how it will be reviewed in
3 there. It tends to set reviewers in different
4 disciplines off on different paths. Again, it is
5 redundant and doesn't facilitate a more consistent
6 look at the review plan. So we will actually in our
7 comments propose a streamlining and put out how we
8 would write this in terms of a more general
9 approach.

10 Another aspect of this is that right now
11 we have these 14 areas we are focusing in, these 14
12 types of modeling, but as science advances, the
13 repository evolves, maybe there's 15, maybe there's
14 13, maybe there's still 14 but there's two that are
15 different than they were before.

16 So, again, by being that detailed and
17 that specific, you are generating a need to
18 continually keep revising the Review Plan through a
19 notice and comment process that takes some time to
20 stay a step ahead of DOE. In fact, it in this
21 aspect is really written to where DOE and NRC have
22 together come as a result of their significant pre-
23 licensing interactions, and this reflects the
24 significance and the quality of those interactions,
25 but it is a snapshot there. Keeping the guidance

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1 more general would still guide the reviewers to look
2 at these things and be more useful.

3 Performance confirmation, there's some
4 -- overall, our view I will get into later in
5 stepwise. The performance confirmation provision in
6 here is a positive one.

7 But there are some prescriptive elements
8 in monitoring and test requirements in there that we
9 feel, again, not appropriate to define at this
10 level. It is curious that some of those same
11 elements were in Draft Part 63. A number of
12 commenters said, no, that's too prescriptive. NRC
13 agreed in Part 63 and said, yes, you're right. And
14 now they have found their way back into the Review
15 Plan.

16 Quality assurance, probably our most
17 significant area of concern here. We agreed strict
18 adherence to QA is a must, but it has to be the
19 right QA. Industry has learned over time that
20 overprescriptive QA isn't necessarily the right QA.

21 Our QA experts from industry looked at
22 this and they found it more detailed and more
23 prescriptive, at a lower level of detail than what
24 you would get in Part 50 space. They also found it
25 curious that you have 22 criteria, whereas we only

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1 have 18, and the additional four criteria are for
2 things like software, physical samples, scientific
3 investigation, and field surveys. We have these
4 things there, and we assure them to be high quality
5 with the other 18 criteria that are applicable to
6 everything you do. We get fine without having --
7 again, you are setting up a specific review path for
8 a specific thing, instead of taking a broader look.

9 And there's other things in there, like
10 requesting the naming of individuals in the QARD.
11 It would tend to lead to DOE's QARD being
12 significantly at a lower level of detail than a QAPD
13 at a nuclear plant, than a QA Program Description at
14 a nuclear plant would be.

15 Again, looking at the risk and
16 opportunity to risk-inform, when you look at the
17 hazard of an operating nuclear reactor versus the
18 more static hazard of fuel in a tunnel, why is more
19 detailed QA appropriate in this context than in the
20 former context?

21 Next slide. Of course, NRC, getting to
22 the stepwise approach, NRC has strongly recognized
23 this as stated here. I think this is a very good
24 quote from the Part 63 rulemaking. It provides the
25 flexibility to make decisions in a logical time

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1 sequence, accounting for the collecting and
2 analyzing of additional information.

3 It is really an opportunity you have in
4 repository that we don't have in any other endeavor.
5 If there is a question, how will this material
6 perform at that temperature, you don't have to have
7 that question answered before you start putting
8 stuff in the mountain; you can, in fact, see how it
9 performs over decades, if you would like.

10 Building that into the license, and in
11 the next slide you see a little more detail. The
12 most important thing to realize here, the two most
13 important things are the fact that there are steps
14 down a couple of places on the curve, and the normal
15 operation -- and, again, this is in the post-closure
16 sense. In the pre-closure sense the expectation
17 should be the same as they are for any operating
18 nuclear facility in terms of fuel-handling or
19 whatever.

20 But in terms of the post-closure sense
21 in normal operations, it does occur until the time
22 the NRC has to make a decision about whether or not
23 to close the repository. All the way up before that
24 time, they will be moving up and down this curve.
25 It ceases to become steps and starts to become more

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1 of a continuing here, because it is such a long
2 period of time, and so much is continuously being
3 gathered here by the scientific program.

4 So at each of these points your
5 confidence grows as you learn more, as time goes by,
6 and there are times when something will be
7 discovered that will cause your confidence to go
8 down. If it happens here before construction, it is
9 a paper issue. It is design changes that can be
10 made on drawings perhaps or analytical changes that
11 could be made in the total system performance
12 assessment.

13 If it happens up here, perhaps it could
14 necessitate some physical modifications. You've
15 already begun to build canisters of one material,
16 and you find, well, no, I need another material. So
17 now your first so many canisters would have to be
18 recalled and brought in.

19 While that might not be desirable, the
20 process should facilitate that. The process should
21 facilitate the stepwise building and continuous
22 building of confidence over time.

23 Down here in the reactor world, again,
24 there is a time component to risk here. When you
25 get to starting up a reactor, then your timeframes

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1 to react are very short. But you have literally
2 decades to construct startup testing, low-capacity
3 testing, full-capacity testing, to continue to
4 learn. The Review Plan should allow for this. In
5 fact, it does.

6 If we go to the next slide, two elements
7 of the Review Plan that we think are -- and, of
8 course, of the regulation as well -- except for the
9 few prescriptive elements in performance
10 confirmation, they are effectively executed here.

11 The research and development program to
12 resolve safety questions, and the sub-bullet here
13 says, "Our vision of how this should be applied,"
14 which I think may be a little bit different from the
15 way it is currently being construed, in that this is
16 issues where you don't have agreement, or don't need
17 agreement, until a later stage, when information is
18 available; whereas, performance confirmation you
19 have agreement, you have closure of an issue. You
20 just want to make sure as you learn more, it stays
21 closed or stays agreed.

22 There is a tendency, I think, because of
23 the unreviewed safety question precedent in the
24 commercial world, to view these as something that
25 you deploy when a problem arises and you don't have

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1 the answer. In fact, in repository space they
2 should actually be much more positive and much more
3 forward-looking than that. In fact, it is actually
4 desirable to construct some of these in advance in a
5 forward-looking manner, as opposed to, "Oh, we can't
6 answer this question. So we will have to carry it
7 forward." Well, deliberately, no, it is more
8 appropriate to answer this question later on. We
9 would like to see that more effectively communicated
10 in the Review Plan.

11 The performance confirmation program, on
12 the previous graph, this really undergirds
13 everything. Whatever conditions and agreements have
14 been made and whatever backs the license should be
15 continued. I think that's, except for the
16 prescriptive elements, that is well-communicated in
17 the Review Plan.

18 So the improvements in the stepwise
19 area, as I already alluded to, we would like to see
20 the Review Plan instruct the reviewers in a way that
21 explicitly recognizes the value of the stepwise
22 approach that thinks about safety questions a little
23 bit differently than you think about them in the
24 commercial world, communicating the why behind what
25 these sections do, not just putting them out there.

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1 I think that would also help in terms of
2 the tension regarding level of detail that exists in
3 various sections of the Review Plan. If the
4 reviewers are thinking in a forward-looking manner,
5 it is okay to only have this much detail on my
6 question now because I know that the license is
7 going to require the following to go on forward.
8 Again, that could simply, the existing elements that
9 are in there could simply be communicated in this
10 context that would really fill the goal there.

11 Again, quality assurance needs to
12 recognize all those different phases: the
13 construction, the testing. Quality assurance, there
14 is a gradation of quality assurance as you move
15 through the phases. It should recognize that.

16 And definition of the path forward,
17 because, you know, I talked earlier about it being
18 overly detailed and overly fixated on where we are
19 in this stage of the process would necessitate the
20 need to revise the Review Plan continuously. By the
21 same token, no matter what you do, you can't have a
22 Review Plan that says nothing. You will need to
23 update it as the process moves forward.

24 Laying out how you are going to update
25 it -- also, again, that gives people confidence that

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1 this process going forward is more than empty
2 promises, that there really is some meat to this.
3 So laying out the process for updating the Review
4 Plan goes hand in hand with that.

5 So that's it for really the two
6 fundamental things that we are concerned about,
7 which is risk-informing and stepwise licensing.
8 Really, this first bullet on even our more detailed
9 comments is almost a subcategory of both of those.

10 Section 1.1.1 of the document, and it
11 has that pyramid figure, does an excellent job of
12 laying out the distinction between inspection
13 activities and a licensing review. There are areas,
14 some of which I have already pointed out, where we
15 felt that that line gets crossed in the Review Plan.
16 This is understandable because, again, there's been
17 so much highly-detailed interactions between DOE and
18 NRC so far that has really strengthened this
19 process.

20 Some of those are down at a level of
21 inspection. I know that the NRC observes QA audits
22 of DOE's all the time. There is a tendency, I
23 think, to want to capture that same level of detail
24 in here, but needs to recognize that there will be
25 an inspection program, in addition to a license

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1 review program, and keeping that in concert.

2 The reasonable expectation versus
3 reasonable assurance, I think the notion of
4 reasonable assurance in the pre-closure context and
5 reasonable expectation in the post-closure context
6 is a good one. NRC needs to more clearly define
7 this distinction. The terms are almost used -- I
8 mean it is pre-closure/post-closure, but they are
9 almost used as if they essentially mean the same
10 thing, and they really don't.

11 Because, again, in the post-closure
12 sense, you've got that time, that time component of
13 risk, and that forward-looking notation is that, in
14 terms of pre-closure safety, you want to know before
15 the first worker starts manipulating the first batch
16 of fuel that he is protected, as well as everybody
17 who lives and works around the site. In the context
18 of protecting the person who is going to live there
19 10,000 years from now, you have a few years to
20 continue to investigate whether or not you think
21 you've got that person protected.

22 So there really is an expectation
23 component to reasonable expectation and more of an
24 assurance component to reasonable assurance, and
25 that should be communicated in the Review Plan.

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1 Again, as I mentioned, we should
2 recognize the extensive pre-licensing interactions.
3 Right now it recognizes it by bringing a lot of that
4 stuff in. You know, it should really take a step
5 back and, without needing to put all the stuff in
6 the Review Plan, recognizing explicitly the
7 contribution that the pre-licensing review makes to
8 the review. The reviewers have that base of
9 knowledge to rely on.

10 Very specific comments, perhaps I am
11 getting too prescriptive here in terms of my own
12 comments, but the meaning of the term "complete" in
13 the acceptance review, you've got that 90-day clock
14 for the acceptance review. What is complete? That
15 is something that different reviewers could
16 interpret differently, and we would like to see
17 better defined.

18 There's three terms in here: important
19 to safety, important to waste isolation, and
20 important to performance. Two of these are defined
21 in 63.2, and we feel are used consistently with
22 their definitions, but we didn't find important to
23 performance. I mean, if it is not important to
24 safety and it is not important to waste isolation,
25 why is it important to performance? What are we

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1 looking for here? That term either needs to be
2 defined or dropped. In most cases, probably one of
3 these other two terms is what is really appropriate
4 there.

5 Bounding values, multiple barriers, the
6 use of the words "spent nuclear fuel" and "high-
7 level radioactive waste" interchangeably need
8 clarification as well.

9 So, in conclusion, I've stressed on the
10 things we, of course, would like to see improved
11 about the Review Plan, but, overall, the scope and
12 high quality of the document is really evidence that
13 NRC has done a lot to prepare to review this license
14 application. People should take confidence from
15 that, the fact that there is already a tremendous
16 amount of thinking, and that you have an agency that
17 is well-prepared for what will be maybe not putting
18 a man on the moon, but a big challenge.

19 It does contain a strong commitment to
20 the principles we feel are the most important, the
21 stepwise and risk-informed, performance-based
22 principles. However, as I have discussed in some
23 detail, we feel that in order for those principles
24 to be implemented, that there are some specific
25 improvements needed in the Review Plan.

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1 That is all I have.

2 CHAIRMAN HORNBERGER: Thanks very much,
3 Rod. I am sure that there are a number of questions
4 for you.

5 Raymond?

6 DR. WYMER: I think I will pass for
7 right now and come back later maybe.

8 CHAIRMAN HORNBERGER: Milt? John?

9 DR. GARRICK: Rod, I was trying to
10 understand a little better your point with respect
11 to the frequent reference to "risk-informed." I
12 think your point was that there is some indication
13 that they are going to be risk-informed on some
14 things, but no reference to being risk-informed on
15 other things, and therefore, the appearance is that
16 it is going to be an unbalanced review?

17 MR. McCULLUM: Yes, the idea is that,
18 especially from Section 1.3 and then throughout in
19 the document, got the impression that they were
20 really risk-informing by exception as opposed to by
21 the rule. Your feedback would be valuable here, but
22 I think the very nature of risk-informing is in the
23 whole scope of the review you focus where the risk
24 is the most significant, and you grade according to
25 the risk. But if you are taking a piecemeal

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1 approach, where we will be risk-informed over here
2 because of this, we will be somewhat risk-informed
3 over here because of that, I don't see how you can
4 truly risk-inform the whole scope of the review.

5 DR. GARRICK: Maybe the answer to this
6 is that, if the NRC, indeed, is adopting the tenet
7 of risk-informed regulatory practice, to say it
8 upfront once and --

9 MR. McCULLUM: Yes.

10 DR. GARRICK: -- then forget it.

11 MR. McCULLUM: Yes. Less use of the
12 word would make the document a lot shorter. Yes.

13 DR. GARRICK: I am very curious about
14 industry's view of the Review Plan. Is there any
15 way you could characterize that by giving us a hint
16 as to the two or three things they consider to be
17 the most important, either in terms of failings of
18 the plan or in terms of things they would like to
19 change?

20 MR. McCULLUM: Yes. The two things, of
21 course, we feel in any nuclear licensing endeavor
22 that it has to be risk-informed, performance-based
23 for it to be successful. The high level of detail
24 in a Review Plan, a high level of prescriptiveness
25 is counter to that. We feel there is some of that

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1 in here.

2 I would say the area where we feel that
3 is the most significant obstacle would be in quality
4 assurance. Then, of course, the second thing is
5 stepwise. It is really in our interest to see this
6 project move forward. We don't see how that can
7 happen if the reviewers all try to put themselves
8 10,000 years in the future and expect to have
9 perfect knowledge of 10,000 years in the future at
10 step one.

11 So if the Review Plan does not
12 explicitly recognize it -- and in some areas that
13 may be taking away some of the prescriptiveness and
14 at the same time explicitly recognizing that, hey,
15 you can use the safety question tool as the bridge
16 to the next step. You can use performance
17 confirmation to the bridge to the two or three steps
18 beyond that. That would be all that it takes.

19 But, really, again, you are getting back
20 to our central interest, which is moving fuel. The
21 stepwise approach is really central to that, as well
22 as, of course, risk-informed. But I would say in
23 both areas I think the area we would like to see
24 most improved is quality assurance, because we have
25 made an incredible journey in the field of quality

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1 assurance. We would like to see the repository not
2 have to start that journey from the beginning over
3 again. It was not always a pleasant journey.

4 DR. GARRICK: Yes, this Committee was
5 very active during the Part 63 development in
6 keeping as much prescriptiveness as possible out of
7 the regulation, particularly with respect to things
8 like subsystem requirements.

9 MR. McCULLUM: Right.

10 DR. GARRICK: Now you have identified
11 quality assurance as an example of where they might
12 be overprescriptive. What other areas do you think
13 the overprescriptiveness kind of creeps back into it
14 that is not in Part 63?

15 MR. McCULLUM: Well, the most obvious
16 one was the one I mentioned about performance
17 confirmation, where the NRC lays out in some detail
18 what it expects in terms of monitoring and tests, as
19 opposed to -- and I think the Committee may have
20 been, along with us and several others, instrumental
21 in commenting on those things in Part 63, that don't
22 be that prescriptive. The NRC recognizes, yes, we
23 shouldn't be.

24 Also, I kind of brushed over the model
25 abstraction section. I mean, you've got 109 pages

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1 of how to review a model abstraction, and you've got
2 specific guidance of how to do it for each kind of
3 abstraction. In each one of those areas, you really
4 are going beyond the reg., because you will remember
5 in Part 63 you stay on very general terms as opposed
6 to what DOE will do to define its safety case. Now
7 you are going down and saying, the safety case
8 consists of these 14 things and here's how you
9 review this one, here's how you review that one,
10 here's how you review the next one.

11 Again, we think you could develop a very
12 strong set of generally-applicable guidance for how
13 you review model abstraction, and looking at how you
14 get to a model that could apply even if they come up
15 with new techniques, new ways of looking at it in
16 the future. So I think there's probably a lot
17 within each one of those 14 sections that crosses
18 over that line.

19 DR. GARRICK: Yes.

20 CHAIRMAN HORNBERGER: Can I interrupt
21 for just a second?

22 DR. GARRICK: Yes.

23 CHAIRMAN HORNBERGER: So I do understand
24 your use of the word "prescriptive" with respect to
25 QA and Section 4.4 as well, the performance

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1 confirmation. But what you just described in terms
2 of the other sections, the 109 pages, doesn't strike
3 me as prescriptive; you are using the word
4 "prescriptive" in the same sense, because those
5 acceptance criteria and model abstractions certainly
6 do not preclude DOE from deciding exactly how they
7 want to make their case, do they?

8 MR. McCULLUM: Well --

9 CHAIRMAN HORNBERGER: I mean, I
10 understand they are detailed. And believe me, I do
11 understand that it is repetitive, because we have
12 all read parts of this.

13 MR. McCULLUM: Yes.

14 CHAIRMAN HORNBERGER: But I just want to
15 clarify, make sure that I understand you are using
16 the word "prescriptive" consistently.

17 MR. McCULLUM: Well, if DOE wanted to
18 make its case using, instead of breaking it up into
19 those 14 models, if they wanted to break it up into
20 only 10 things, combining a couple, if there is one
21 where one of them overlaps into another, I think it
22 would make the Review Plan more cumbersome.

23 Also, there are interrelationships
24 between the areas, and you almost, by telling the
25 reviewers in each discipline that, "This is your

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1 section. This is how you review a model
2 abstraction. This is your section," you almost
3 facilitate a stovepiping and cut off the cross-
4 pollination. You are right, it is a different
5 sense. Overprescriptive doesn't do justice to what
6 I am trying to say. Instead of an up-and-down level
7 of detail thing, it is more of a cross-cutting
8 thing. But I think it is something we would still
9 like to see addressed.

10 DR. GARRICK: I think that is all for
11 now.

12 CHAIRMAN HORNBERGER: Raymond, do you
13 have a comment?

14 DR. WYMER: Yes, I had a comment. Your
15 understanding of the various qualifiers on risk-
16 informing is somewhat different from the way I
17 interpret it. I have really read that to mean that
18 they were merely pointing out in the YMRP that there
19 are different levels of risk information required
20 for different degrees of risk. That is how I read
21 that, rather than reading it --

22 MR. McCULLUM: Well, I can go back to
23 what John said on that, and just say that upfront,
24 because that is what risk-informing is all about.
25 But when you make a unique argument for risk-

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1 informing in each area, you've already essentially
2 attempted a linear risk-informing underneath the
3 context of -- I would just go back to saying that
4 upfront, as well as taking out the level of detail,
5 as opposed to trying to give a reason why you have
6 to do it here, why you have to do it there.

7 DR. WYMER: Yes. It is true that they
8 were sort of presuming the degree of risk in making
9 those statements, but it didn't hit me quite as hard
10 as it seemed to hit you.

11 MR. McCULLUM: Yes, and that's the way
12 it hits us.

13 (Laughter.)

14 DR. WYMER: Okay, that is what I wanted
15 to say.

16 CHAIRMAN HORNBERGER: Rod, I have just a
17 couple of things I want to clarify, make sure I have
18 your communication straight.

19 It strikes me that you identified
20 performance confirmation Section 4.4 as overly
21 prescriptive, and that was one comment, but you then
22 also had another comment on performance
23 confirmation. That is that you thought that there
24 should be specific mention or explicit mention that
25 performance confirmation should be viewed as an

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1 opportunity to resolve some issues or agreements
2 that haven't reached resolution in the current
3 terminology. Is that right?

4 MR. McCULLUM: Well, actually, let me
5 clarify. That goes back to the one slide on those
6 two elements.

7 Again, I want to distinguish between the
8 usefulness of performance confirmation as a tool to
9 implement stepwise licensing and maybe things that
10 are specific, very specific, very narrow problems
11 with what is in performance confirmation here. I
12 think those are -- again, risk-informing my comments
13 -- those are of a much lower level of importance,
14 the specific problems in the overall importance of
15 it.

16 But the way we see, you have two tools
17 in here. You have the research and development for
18 safety questions, and you have performance
19 confirmation. I would see research, it is a safety
20 question if you don't have agreement between DOE and
21 NRC. You recognize that information you will
22 collect over time will get you to an agreement, and
23 then you have, of course, provisions for, well, what
24 if it doesn't.

25 Whereas, performance confirmation is

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1 really where you do have an agreement, where the KTI
2 is closed, for example, and what you want to do is
3 confirm that, as you learn new things, that
4 agreement stays an agreement, that something that
5 both parties assumed doesn't turn out to be
6 incorrect, whereas in safety questions maybe both
7 parties are assuming, each party is assuming
8 something different, and that is okay for now.

9 CHAIRMAN HORNBERGER: Right, and so I
10 did understand you correctly then. This also ties
11 back in with your suggestion that reasonable
12 expectation should be defined. I mean, your
13 preference would obviously be to have reasonable
14 expectation tied back into this notion that you
15 could have a stepwise approach --

16 MR. McCULLUM: Right.

17 CHAIRMAN HORNBERGER: -- and using
18 performance confirmation to resolve some open
19 issues.

20 MR. McCULLUM: Yes, the term to me,
21 "expectation" versus "assurance," connotes a very
22 long forward look, you know, far into the future,
23 which does imply that you will keep looking as you
24 go into the future; whereas, assurance is that guy
25 is going to be moving the fuel tomorrow; is he safe?

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1 I think they are distinctly different terms, and
2 that should be communicated.

3 CHAIRMAN HORNBERGER: I guess, lastly --
4 and, again, this is all sort of part of one thought
5 almost -- you suggest that there should be explicit
6 mention in the Plan made of the stepwise procedure.
7 I am not quite sure that, having looked at the YMRP,
8 that I could myself say, okay, here's how I would
9 suggest you change the plan to do that.

10 Do you have any ideas on how that might
11 be done?

12 MR. McCULLUM: Yes. I would build --
13 and this is one where we are not proposing a
14 specific rewrite; we are just making a comment. But
15 I would propose in this case is I would build on the
16 statement that I had up here on the one slide, which
17 is a quote from the rulemaking -- actually, it was
18 in the response to comments --

19 CHAIRMAN HORNBERGER: Right.

20 MR. McCULLUM: -- which I think in one
21 very short paragraph elucidated taking in new
22 information and making decisions as you go along.
23 Then I would follow that with a couple of short
24 paragraphs, and this is how the safety question tool
25 helps you do that, and this is how the performance

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1 confirmation tool helps you do that, and maybe even
2 a sentence or two about, "and this is why you keep
3 the level of detail low, so that you can progress
4 forward," tying that in also to laying out what is
5 the path for updating the Review Plan as you go
6 forward.

7 CHAIRMAN HORNBERGER: Marty?

8 DR. STEINDLER: Well, I guess I have
9 just a couple of comments, but one of them I think
10 may be --

11 DR. GARRICK: One of them may last an
12 hour?

13 (Laughter.)

14 DR. STEINDLER: Yes, it that all right?

15 (Laughter.)

16 You made two comments which strike me as
17 strange interpretation of what this Plan is all
18 about. One of them, you said that the regulatory
19 framework is to be derived from the Review Plan.
20 The other one, it seems to me that what you are
21 doing is you are looking at the Review Plan as
22 though it were a regulation.

23 The Review Plan is neither the
24 determiner of the regulatory framework or any part
25 of the regulation, isn't that correct?

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1 MR. McCULLUM: Yes, absolutely, I agree
2 with what you are saying. If I jumbled up my words,
3 I apologize.

4 What I meant to say, if I didn't say it,
5 this is an important element of the regulatory
6 framework in that it is an implementing tool. It is
7 what guides the reviewers in terms of implementing
8 the regulation.

9 The comments I was making were intended
10 in the vein of, what are the reviewers going to do
11 with this guidance? If I didn't communicate that
12 appropriately, I apologize, but that was my intent.

13 DR. STEINDLER: Okay, and so you get
14 down to the question of, what is the reviewer going
15 to do with whatever is written in the Plan?

16 MR. McCULLUM: Right.

17 DR. STEINDLER: There are many aspects
18 of that Plan that basically said the reviewer can do
19 whatever the reviewer needs or wants to do based on
20 risk.

21 MR. McCULLUM: And we agree with that,
22 yes.

23 DR. STEINDLER: Okay. The reviewer does
24 not have to follow the Plan. DOE does not have to
25 follow the Plan. It is simply a functional outline

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1 to go through this massive license application, the
2 safety case, that is going to have to be looked at
3 by a whole bunch of people.

4 In that context, I guess I have a
5 difficulty trying to understand why it is, with the
6 flexibility that is already listed in here, that you
7 would object to somebody saying, "Oh, by the way, in
8 Abstraction 12 -- or 14 -- you need to look at the
9 following three items," those three items having
10 been derived from 10 years' worth of interactions
11 between NRC and DOE and other people looking at what
12 is important in that abstraction to the safety case,
13 the high risk.

14 Now what is wrong with specifying or
15 alerting the reviewer that that is something they
16 ought to look at?

17 MR. McCULLUM: Well, I think there is
18 nothing wrong with it. I really agree with the
19 first part of your comment. Of course, the Review
20 Plan, the reviewer has the option, DOE has the
21 option to do something different.

22 I would simply suggest that, when there
23 is something that -- and, remember, we made one
24 comment to describe the relationship of the pre-
25 licensing review to this Review Plan -- is that, in

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1 those various 14 areas where there are things that
2 are important enough that you feel that it is value
3 added to tell the reviewer, "Hey, you know, we went
4 through this whole thing in pre-licensing review in
5 this area," do that by exception, not by the rule.

6 The way it is structured now is the rule
7 is every type of model abstraction has its own
8 stovepipe, essentially, in the Review Plan. I think
9 it is possible to do what it is you are suggesting,
10 still having a more unified, consistent guidance.

11 In terms of the reviewer being able to
12 do something different than the Review Plan, well,
13 yes, but the thing is we would like a Review Plan
14 that would help move -- again, our goal, to move
15 fuel -- that helps propel the review forward and to
16 propel it credibly forward. I guess, in our view,
17 having a Review Plan that is defined along 14
18 specific model abstractions, each one having its own
19 section, isn't necessarily as helpful as one that
20 had consistent, more general guidance with those
21 things that are important identified. But, you
22 know, that is just our opinion.

23 CHAIRMAN HORNBERGER: Mike?

24 DR. RYAN: Yes, one question on your
25 graph, if you would throw it back up on the board.

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1 CHAIRMAN HORNBERGER: The question is:
2 Is time a logarithmic scale?

3 (Laughter.)

4 DR. RYAN: That's right.

5 MR. McCULLUM: Where are the EPRI guys
6 when I need them?

7 (Laughter.)

8 You went past it. Go back that way
9 again (referring to the slide). There was only one
10 graph in there.

11 DR. RYAN: Thank you. That is fine.

12 In fact, that was an interesting curve.
13 It got me to think about the following: At some
14 point there is no longer a license application and
15 the Review Plan; there is a license and license
16 conditions.

17 MR. McCULLUM: Right.

18 DR. RYAN: How do you see this Plan
19 evolving, changing, going away on your timeline, and
20 how does that transition process work? How do we
21 get from a licensee review to a license itself?

22 MR. McCULLUM: I think what you are
23 talking about there, in large part, is the boundary
24 between the license review and the inspection
25 review. Because in a couple of key steps here, NRC

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1 is going to make a licensing decision. They are
2 going to authorize construction. They are going to
3 authorize operating, and they are going to authorize
4 closure.

5 After having made each of those
6 decisions, they are going to continue to inspect to
7 make sure that the facility is operating within the
8 constraints of what has been licensed, even as that
9 is evolving. That is, again, why we commented it is
10 important, and Section 1.1.1 does this, and I think
11 we would like to see it more rigorously, not
12 rigorously, more consistently carried out through
13 the document, of recognizing that distinction.

14 Maybe a lot of these more detailed
15 things do belong in an inspection plan. Maybe it is
16 easier in each of these areas and more useful to
17 revise the inspection plan more frequently, based on
18 successive inspections. The Review Plan does lose
19 its utility, at least in certain respects, in each
20 licensing decision. The inspection plan has to take
21 over.

22 DR. RYAN: Do you feel that transition
23 is explicitly laid out enough?

24 MR. McCULLUM: No. We would like to see
25 that -- I mean, it is eloquently defined, as I say,

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1 right up in Section 1.1.1, but laying it out further
2 into the document, again, I think that tends to --
3 remember, I am thinking in terms of what is the
4 reviewer going to do with this Plan. In the way the
5 Plan was written, and at the level of detail it was
6 written in in some areas, there's a thinking,
7 particularly since a lot of these reviewers have
8 already been in what is effectively inspection
9 space, because of all the detailed interactions,
10 there is a thinking, well, we've got to get all that
11 stuff in the licensing Review Plan.

12 You can approve a license that has
13 conditions in it that you have to live within, and
14 then the details of assuring you are within those
15 conditions then do become -- and I think reminding
16 the reviewers that that exists will help rein in the
17 tendency to want to make all the details part of the
18 licensing review, if that is clear.

19 DR. RYAN: Yes, it is helpful, and I
20 think it made the other point, that you don't want
21 the reviewers to be thinking about 10,000 years all
22 at once at the beginning.

23 MR. McCULLUM: Yes. I mean, they need
24 to map out; they need to have the steps in front of
25 them. They need to see that that is going to

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1 progress. They can't be up here way back there. It
2 is just not possible.

3 DR. RYAN: Thanks.

4 CHAIRMAN HORNBERGER: Richard? Anyone
5 else? Sher?

6 DR. BAHADUR: Rod, I just had a comment
7 on your slide 6, which is two slides before that.
8 This is in the similar vein as Marty was mentioning.

9 In Bullet No. 3 you talk about the
10 prescriptive elements being removed from the Part 63
11 and then returned to YMRP. To me, from my
12 perspective, this seems to be a strength in the
13 regulatory framework where we take out the
14 prescription from the rule, but then take the
15 similar ideas and put them in the guidance, either
16 for a licensee to meet the rule or for the NRC staff
17 to make sure that there is a compliance.

18 Yet, you consider that as a criticism.
19 I was just wondering, why? Where's the disconnect
20 here?

21 MR. McCULLUM: Well, the disconnect is
22 really very simple. It is because putting it back
23 in here misses the reason why it was taken out of
24 the regulation. The reason it was taken out of the
25 regulation was because it was decided that it should

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1 be up to DOE to propose what the monitoring and test
2 program should be, and for the regulator to say, "We
3 agree with that", "We don't agree with that," to ask
4 questions, to suggest improvements.

5 Putting it back in the Review Plan, it
6 is not a strictly linear relationship between
7 regulation at this level of detail and Review Plan
8 at this level of detail. You fundamentally now
9 cross the boundary between letting the licensee
10 define something and not letting the licensee define
11 it. We don't feel that is appropriate.

12 DR. BAHADUR: Yes, I think that is an
13 excellent point. Of course, you realize that YMRP
14 is only giving you one way of meeting the
15 regulation.

16 MR. McCULLUM: I realize that.

17 DR. BAHADUR: The licensee always has a
18 liberty and independence to come up with an equal
19 and comparable approach by which the rule could be
20 met.

21 MR. McCULLUM: Right, and we would like
22 to see DOE scientists be as creative as we know they
23 can be. The tendency to rest on the predefined way
24 in the Review Plan, we know it would be out there
25 again. We are thinking in terms of, what are the

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1 people in the system going to do with this plan and
2 will it help them get their job done, when we make
3 those sorts of comments.

4 DR. BAHADUR: Okay.

5 CHAIRMAN HORNBERGER: Mike?

6 MR. LEE: I am kind of troubled by your
7 comment or your observation about looking past or
8 not considering the 10,000-year issue right now.
9 The whole notion behind the repository is to locate
10 a geologic structure and do some limited engineering
11 and rely upon the combination of engineering and
12 geology to contain the waste over a 10,000-year
13 period.

14 So it seems that one of the principal
15 focuses of at least the construction authorization
16 review is to evaluate DOE's understanding of the
17 issues that would lead to a conclusion with
18 reasonable assurance or reasonable expectation that
19 the repository is going to perform as intended,
20 because that is the Commission's criterion in
21 issuing the construction authorization.

22 So somehow I think throughout the
23 licensing review you would have to keep your eye on
24 that 10,000-year criterion because that is
25 ultimately what you are going to be building the

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1 repository for. Do you want to elaborate on that?

2 MR. McCULLUM: Yes, absolutely.

3 MR. LEE: This isn't an MRS. It is a
4 geologic repository for the disposal of spent
5 nuclear fuel and other high-level waste.

6 MR. McCULLUM: Absolutely, and the
7 concept of disposal is very important to us. We
8 don't think an MRS gives us the kind of business
9 certainty that disposal does.

10 MR. LEE: Yes.

11 MR. McCULLUM: If we could go back to
12 the graph for a second, I am glad you asked that
13 question because I don't want to leave any
14 misperception here. I absolutely agree, you have to
15 keep your eye on 10,000 years. That is the
16 expectation here. I mean, everybody has agreed that
17 that is the appropriate length of time in the future
18 to look.

19 Saying that you take a stepwise approach
20 to getting to that does not mean you don't keep your
21 eye on it. It is really about -- and the reason I
22 bring this up -- it is about that word on the side
23 there, "confidence." We are well above zero
24 confidence now, and maybe the scale is confusing.

25 It is not not having a vision of what

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1 10,000 years looks like; it is how much confidence
2 you have in that vision. Another way to put it is
3 in terms of uncertainties. I mean, DOE right now
4 has on the table a TSPA that gives you a dose rate
5 at the end of 10,000 years.

6 Both the NRC and DOE have varying levels
7 of confidence in everything that goes into that. In
8 some areas you have the same level of confidence.
9 You've closed a lot of key technical issue
10 agreements. In some areas you would like to see DOE
11 do more. In that, both parties are keeping their
12 eye on 10,000 years.

13 What I am suggesting here is not that
14 you agree on a model and agree on the way the
15 process works and agree on a dose rate, but that you
16 understand that your confidence in what those
17 parameters are 10,000 years from now will increase
18 as time goes by. No matter how much confidence you
19 have now, you will have more 10 years from now, even
20 more 100 years from now.

21 In reviewing the license application,
22 you look at things in terms of safety questions, in
23 terms of confirmatory research, that are
24 specifically designed into the license to
25 deliberately build your confidence as you go

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1 forward. But there is a certain minimum level of
2 confidence down here. You can't get to a
3 construction authorization without at least this
4 much confidence, and this gets back to: Is it
5 linear or is it logarithmic, whatever it is?

6 I mean, there's some level of confidence
7 that you have to reach before you can do this.
8 There is even a higher level of confidence you have
9 to reach before you can do this. Indeed, on the
10 pre-closure side, the level of confidence you have
11 to reach here is the same for saying, "Go operate a
12 reactor."

13 Then, of course, the ultimate level of
14 confidence is here when you are saying, "We've done
15 the best that our civilization can do. We don't
16 feel we have done a disservice to anybody that will
17 be living here 10,000 years in the future." That is
18 what needs to the highest.

19 Getting back to your point, this whole
20 thing, this whole review does have to be carried out
21 with a very clear focus on 10,000 years. I think
22 that focus gets sharpened by building things into
23 the license that allow you to increase your
24 confidence.

25 MR. LEE: Thank you.

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1 CHAIRMAN HORNBERGER: I think we are all
2 conceptually talking about the same thing, but I
3 feel I should point out that we don't want to
4 misrepresent what agreements between NRC and DOE are
5 or are not. An agreement to close a KTI or a
6 subissue, I do not think means that NRC staff has
7 agreed that there's sufficient confidence in that,
8 but rather that there is sufficient information for
9 them to judge whether or not a license application
10 meets the requirements.

11 MR. McCULLUM: Yes, I would agree.

12 CHAIRMAN HORNBERGER: Perhaps that is a
13 fine distinction in your view.

14 MR. McCULLUM: No, it is a fine
15 distinction. Of course, the more information you
16 have, either the more or less confidence you have.
17 I mean, you look at these down ticks here. You
18 could have closed an agreement on a topic because
19 you thought you had enough information, and then the
20 one piece of information you didn't have comes in,
21 and now you are knocked back a step.

22 So the fact that you reached an
23 agreement at this level, you are right, there is a
24 fine parsing between confidence and the distinction
25 of what we have agreed to in terms of information.

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1 CHAIRMAN HORNBERGER: Other questions or
2 comments? Tim?

3 MR. KOBETZ: With regard to the quality
4 assurance, can you give us some specific examples as
5 to where it is too prescriptive? Because when I
6 looked through it, I thought it gave good acceptance
7 criteria and kind of told you exactly what an
8 acceptable program will look like.

9 MR. McCULLUM: Well, sure. One example
10 I kind of alluded to was when it talks about
11 organization issues, it asks for individual names as
12 opposed to broad descriptions of who is going to --
13 or how this is going to organizationally be
14 fulfilled.

15 There's topics where it appears that the
16 reviewer is going to be required to look -- in a
17 nuclear Part 50 QAPD, you would see merely an
18 affirmation that the requirement is going to be met,
19 that the criteria is going to be fulfilled.

20 There's a lot of looking into what
21 specifically fulfills that, what individual, what
22 procedure. A lot of this stuff certainly should be
23 addressed in inspection space. When you inspect,
24 when the licensee commits to "my QA program will do
25 this and this and this and the other thing," you

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1 don't just take that for the word. When you go in
2 inspection space, you will look at their this, their
3 that, and the other thing.

4 Also, the fact that there are 22
5 criteria, instead of 18 criteria, and I mentioned
6 those four additional criteria are things to which
7 you can apply all the other 18 criteria; they are
8 just specific areas in which you apply it, such as
9 your scientific program or your software. They are
10 areas that in the commercial world we apply the
11 traditional 18 criteria to with great success.

12 The notion that they somehow have to be
13 special, that they have to be specifically
14 addressed, again, that is getting back to George's
15 point earlier. That is a different -- that is more
16 of a cross-cutting than a linear type of
17 prescriptiveness.

18 In our detailed comments, we will cite
19 specific examples, quotations, those types of
20 things.

21 DR. GARRICK: Picking up on that, one of
22 the things we hear about now, once in a while, with
23 respect to QA is a graded QA philosophy; that is to
24 say, a quality assurance program that is
25 commensurate with contemporary risk-informed

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1 regulatory practices.

2 Were there any comments from industry at
3 all about how the tenets of risk-informing this
4 whole process, how that is mapped into the quality
5 assurance program?

6 MR. McCULLUM: Yes, we address in our
7 detailed comments -- and I just gave a broad
8 overview here, but we do address that in terms of
9 both our risk-informed comment we have a very
10 specific discussion of quality assurance, and in our
11 stepwise comment we have a very specific discussion
12 of quality assurance.

13 The notion is that, as you move through
14 the scientific analysis, the construction, the
15 startup, the testing, there are gradations of
16 quality assurance. So as you go forward in time,
17 there is a gradation. As you look pre-closure/post-
18 closure, there is gradations. There's gradations in
19 terms of certain aspects of the repository are more
20 significant risk contributors than others. We do
21 talk to that, yes.

22 DR. GARRICK: Is that part of the
23 flexibility issue?

24 MR. McCULLUM: Right, because when you
25 attempt to very specifically define all these areas

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1 in a Review Plan, when you tell all the reviewers,
2 you presuppose that those judgments have been made,
3 and it is really up to the applicant -- one of the
4 first points we made is the recognition in this
5 Review Plan that it is up to the applicant to
6 propose the risk-informing and, of course, up to the
7 NRC to say, "Yes, we agree" or "We don't agree."

8 DR. GARRICK: Thank you.

9 CHAIRMAN HORNBERGER: Any other
10 questions or comments?

11 (No response.)

12 Okay, thanks very much, Rod.

13 MR. McCULLUM: Thank you.

14 CHAIRMAN HORNBERGER: We appreciate it.

15 In continuing along on the same subject,
16 I would like to invite our consultant, Marty, to
17 make any comments that he wants. I see you have
18 drafted Part 6 while we have been talking.

19 (Laughter.)

20 DR. STEINDLER: Part 12.

21 (Laughter.)

22 Well, this particular document I guess I
23 viewed from the standpoint of not only the ACNW, but
24 also the Atomic Safety and Licensing Board, and
25 then, finally, of course, the Commission because

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1 that is where everything else ends up.

2 This discussion and some of the other
3 discussions have made it fairly clear that the
4 speakers sometimes have a great difference in what
5 they think the document is supposed to do, who it is
6 addressed to, and, equally important, what it is not
7 supposed to do. I don't see that people are paying
8 a whole lot of attention to the introduction to this
9 fairly thick document, which I thought made it as
10 clear as most things are in this document, which is
11 damning it with faint praise, about what it is
12 that --

13 CHAIRMAN HORNBERGER: You liked it, too,
14 huh?

15 (Laughter.)

16 DR. STEINDLER: It is a great read.

17 (Laughter.)

18 DR. WYMER: If you like mysteries.

19 (Laughter.)

20 DR. STEINDLER: That was the point I was
21 trying to make here, that it is clear that this is a
22 guide. It is a guide to a fairly large bunch of
23 people who are going to be stuck with looking at the
24 safety case, and they've got three years to go
25 through it.

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1 It strikes me it is a great idea to give
2 that assembled company as much guidance as you
3 possibly can on what to do, what to pay attention
4 to, and as I point out in one of these notes that I
5 have fired around, by the time this gets around to
6 being reviewed, there are going to be an awful lot
7 of people who have participated in the NRC/DOE
8 interaction that are retired. You are going to have
9 a bunch of folks in here who may not know the
10 history in enough detail to be able to understand
11 and remember the nuances of the interactions and the
12 difficulties and the places where you had big
13 arguments, et cetera.

14 So I guess I come out of the notion that
15 if you provide some detail on what a fairly naive
16 but very technically-smart reviewer is supposed to
17 look at, that will give him some kind of clue as to
18 what to pay attention to. Those details ought to be
19 somehow related to the level of risk that is
20 involved with them. I suppose that is what people
21 mean by risk-informed, but that is another story for
22 another day, since I never could figure out what
23 risk-informed really means.

24 I can tell you what I think this
25 document is not. It is not a regulation. It is not

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1 a policy, and it is not a guide of how regulations
2 are going to be enforced.

3 It is a Review Plan, at least as I read
4 it, it is a Review Plan that tries to take the poor
5 person who is going to try and coordinate this whole
6 thing into a coherent, very short message to the
7 Commission, saying, "Yes, it flies"; "No, it
8 doesn't."

9 Ultimately, it is going to be the answer
10 that either the Atomic Safety and Licensing Board is
11 going to put together or the Commission is going to
12 put together. They are going to have to put it
13 together from the Safety Evaluation Report that is
14 presumably going to be the product of all these
15 reviews.

16 Therein lies another problem because I
17 think that the coordination issue is mechanical in
18 this document, but not substantive. It isn't clear
19 how the grades that they are going to instill on
20 each of the pieces are going to eventually come
21 together into a singular, or relatively singular,
22 opinion that, yes, it is or, no, it is not
23 satisfactory. I am talking about the safety case,
24 the DOE safety case.

25 DR. GARRICK: You gave a lot of emphasis

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1 to this not being a regulation. Of course, I am
2 sure you are sure that the NRC understands that very
3 clearly. Is your worry here that the licensee, the
4 applicant, may be reading this as something that it
5 isn't?

6 And it is not unprecedented because reg.
7 guides get in that same position.

8 DR. STEINDLER: Right.

9 DR. GARRICK: Reg. guides become law in
10 the minds of licensees when in fact they are not.

11 DR. STEINDLER: And those words are all
12 to be found here, addressed to whoever. The
13 applicant can do what it wants to, but it would be
14 nice if they followed the following reg. guide kind
15 of an approach. That is fine.

16 The Commission has had a long, and I
17 think fairly successful, history in reg. guides.
18 Have they been too prescriptive? Well, I think a
19 lot of people would say, "Absolutely." Have they
20 allowed for deviation from the reg. guide? Clearly.

21 There is a little bit of a concern. I
22 don't think, John, that the Department of Energy is
23 going to misunderstand this document. These guys
24 have been at it for 15 years with the staff.

25 DR. GARRICK: Right.

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1 DR. STEINDLER: They may not be all the
2 same for 15 years, but I think they understand
3 fairly clearly what Part 63 is and what this
4 document is.

5 It is not so clear that the other
6 potential intervenors, the other folks that
7 contribute, will look at it quite the same way. I
8 thought I heard -- and this is why I made my comment
9 -- NEI saying to me, "Hey, you know, this is almost
10 a regulation." It is not, in my judgment.

11 DR. GARRICK: Yes.

12 DR. STEINDLER: It is far from it.

13 Okay, well, having said all that, how
14 good is it? It is a terrible read. As I think Ray
15 pointed out, your eyes glaze over fairly quickly.
16 On the other hand, it is not supposed to be fun to
17 read.

18 (Laughter.)

19 Anyway, I share the concern of the
20 Commissioner who said this is awfully thick, but I
21 think, you know, so it's thick. It is redundant.
22 Yes, it is terribly redundant. Sometimes it looks
23 like it is written by a committee.

24 Finally, I think the biggest criticism
25 that I would have superficially is that I don't see

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1 how it is all going to come together into a focused
2 final report. That is assuming that a focused final
3 report is the end product. I think it is. I think
4 the Atomic Safety and Licensing -- if I sat on the
5 Atomic Safety and Licensing Board again, and all
6 this stuff would come in front of me for the two
7 years that it takes to hold a hearing, I would say,
8 yes, that's what I would be looking for, some kind
9 of bottom line.

10 Now the Commission has clear license --
11 a terrible pun -- to instruct the ASLB to do
12 anything it wants. In the case of the S-3 Table
13 that I was on, the Commission explicitly instructed
14 us to make a record, not to make a conclusion.
15 Okay, so we got a record, and it turned out to be a
16 thick document.

17 ECCS hearings I think in part were
18 20,000 pages of a record. So somebody could then go
19 and see what the world of ECCS was all about.

20 I have no idea what the Commission is
21 going to plan to do here. Eventually, they are
22 going to decide. But if I were sitting on the
23 Atomic Safety and Licensing Board panel, and the
24 Commission would basically come to the panel and
25 say, "Look, you guys do what you're set up to do, an

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1 orderly hearing with all participants being able to
2 cross examine, federal laws of evidence, et cetera,
3 et cetera, et cetera, and at the end we want to know
4 what the bottom line is because that is what we are
5 going to review before we, the Commissioners, give
6 our judgment."

7 I would expect to see in this document
8 some kind of hint as to how this whole thing is
9 going to come together. It isn't there.

10 Okay, that is perhaps the one
11 overarching issue that I have. Then my others are
12 on the specificity. I think this thing lacks
13 specificity on issues that 10-15 years of
14 interaction between the staff and DOE have clearly
15 pointed out to be important. Does it remain
16 important as you walk your way through the
17 abstraction process? Some do; some don't. But you
18 can't tell that from here.

19 It seems to me to highlight the issues
20 that are important, or have been determined to be
21 important to risk, as the abstraction process goes
22 through its machinations, it strikes me would be a
23 very useful thing to have, if I were a reviewer.

24 DR. GARRICK: But isn't the fact that
25 there are 14 abstractions a product of that kind of

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1 exchange?

2 DR. STEINDLER: Yes, but that is only
3 one product. I think that is more an organizational
4 issue than it is a risk-related topic issue.

5 As you look at the world of Yucca
6 Mountain, you've got something on the order of 25
7 technical and scientific disciplines that have to
8 interact in this system. Well, so they have picked
9 on 14 by combining several. They could have picked
10 on 12, for all I care.

11 I mean, the issue is, do you cover all
12 the phenomena? I think the 14 probably do. I
13 haven't looked that hard, but I think all of the
14 phenomenon of consequence that have been over the
15 years determined to be important to safety are
16 covered in the 14.

17 Now the concern that was raised, "Well,
18 gee, there may only be 12 that are important as far
19 as DOE is concerned, when DOE finally comes in,"
20 there is enough flexibility in this document that
21 that shouldn't make any difference.

22 DR. GARRICK: Yes.

23 DR. STEINDLER: Well, that is basically
24 it. Would I change this document? Well, it depends
25 on how much time I have. To really change it and

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1 turn it into a easily-read, you know, guide for the
2 reviewer, I think it would take a lot of work.

3 Can you patch it? Yes, I think you can
4 patch it, and I would patch it by specificity
5 because I happen to be a strong believer that
6 somebody is going to be doing the review process who
7 doesn't know everything that has gone on in the
8 past, and somebody ought to remind them.

9 DR. WYMER: Well, one of the things we
10 discussed among ourselves, Marty, was whether
11 different reviewers would come at this from a
12 different point of view, a different standpoint.
13 Considering one person might say this risk is the
14 biggest in his mind, and another person might say
15 this risk is the biggest. How well does it deal
16 with evening things out so that everybody has the
17 same point of view?

18 DR. STEINDLER: Oh, I don't think it
19 does that at all. The real question that I would
20 have for you, Ray, is: Is that necessary? My
21 answer is, I think the intervenor process will cover
22 that. Or the performance assessment, digging into
23 the models will determine fairly -- well, not fairly
24 quickly, but it can be used to determine what is
25 important to risk.

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1 I think I would go at it from the
2 standpoint, let's see what the model says. My first
3 question, as you know, is: Is the model still
4 representing the real world? And if the answer
5 there is yes, then let's move on. If the real world
6 is represented by that model, where are the
7 important parameters? How did we get to them? Are
8 they really important?

9 By the time you have run all that down,
10 in theory, even the reviewer who comes into the
11 review process, like I think they all will, having
12 some personal judgment as to what's important in a
13 particular area, I think they will eventually be
14 driven by the arithmetic to at least a common
15 conclusion.

16 Now you go back to John's point of some
17 years ago, the uncertainties are so hard to quantify
18 that you can, in fact, have two reviewers looking at
19 the same final answer, ignoring their view of the
20 uncertainties, and come up with different
21 conclusions.

22 DR. WYMER: At one of the meetings that
23 we had a while back, it was pointed out to us that
24 the disparate pieces of this were being reviewed by
25 different groups in different ways.

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1 DR. STEINDLER: Right.

2 DR. WYMER: They did, in fact, have very
3 different bases for judging what was important and
4 what wasn't. One of the principal benefits of the
5 get-together that was had among the staff was that
6 they finally sort of converged, but I am not so sure
7 how fine a point that convergence has reached.

8 DR. STEINDLER: It may not be
9 satisfactory because you don't know it until you get
10 into it, but my general view of, again, the Atomic
11 Safety and Licensing Board activity here is, if the
12 NRC presents a particular point on an issue, one of
13 the abstractions, and DOE thinks they are way
14 offbase, I would expect DOE to rise in orbit and
15 say, "Hey, you guys have got it all wrong and here's
16 why you've got it all wrong." Let's cross examine
17 each other.

18 That is what the scientific court is
19 really supposed to do. Then with any kind of luck,
20 intervenors or people who have yet another
21 contribution to make, have done their homework well
22 enough so that you may get two, three, four
23 additional technical views, then ultimately the
24 Board, the ASLB, is going to have to say, "Well, we
25 have now heard these three, four, five items. This

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1 is what we and our consultants think the final
2 answer is."

3 DR. WYMER: So you are relying on checks
4 and balances that are outside of this document?

5 DR. STEINDLER: Absolutely. Well,
6 presumably, that is one of the reasons that the ASLB
7 was set up.

8 So I look at this thing and I say, well,
9 it's a pretty good job. Just because I fall asleep
10 when I read it, that's not their fault.

11 (Laughter.)

12 And it wasn't supposed to be the world's
13 greatest novel.

14 DR. WYMER: It happens to us old-timers;
15 we fall asleep when we read.

16 DR. STEINDLER: Yes, that's right.

17 (Laughter.)

18 CHAIRMAN HORNBERGER: Jeff was hoping it
19 would hit the New York Times Best Seller List. I
20 mean, he wrote it to be entertaining.

21 (Laughter.)

22 DR. STEINDLER: Whatever. It does lack
23 illustrations though.

24 (Laughter.)

25 But somebody made a comment that it

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1 would be good to have an example in an appendix. I
2 don't know whether it was Milt -- or somebody. I
3 would agree with that. It would make it easier for
4 a non-NRC, non-DOE person who reads this to have
5 some kind of an idea of what this process is likely
6 to be. Because the ASLB process, while it seems
7 obvious on the surface if you have been there, may
8 not at all be obvious to somebody who is drilling a
9 hole in Nye County someplace.

10 CHAIRMAN HORNBERGER: Marty --

11 DR. STEINDLER: Does that add anything?

12 CHAIRMAN HORNBERGER: Yes. I just
13 wanted to throw in a question on a slightly
14 different topic. When we just heard from Rod, he
15 mentioned that the NEI thought that they would
16 recommend taking the 109 pages and all the different
17 abstractions and making it one common section. Milt
18 had anticipated that comment; he had made it on his
19 own. He had suggested that, really from almost a
20 legal standpoint, that the NRC would be much better
21 off having it one place and then just talking about
22 exceptions. Yet, that would be, I guess, a fairly
23 major revision of the document, and --

24 DR. STEINDLER: I don't think so.

25 CHAIRMAN HORNBERGER: Oh, okay.

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1 DR. STEINDLER: You could lift those
2 same sentences out of 14 out of the 14.

3 CHAIRMAN HORNBERGER: Okay. So then my
4 question was, you wouldn't count that, then, as a
5 major revision, and therefore, not --

6 DR. STEINDLER: No, I wouldn't. In
7 fact, I think the point that Milt made was a good
8 one. Take the commonalities and put them someplace.
9 Then I would go back to the abstractions and say,
10 okay, what do I remember, what do I know about these
11 abstractions that were particularly important topics
12 related to risk that you want to highlight for the
13 reviewers. If there are none, there are none. I
14 would find that surprising. But that is where you
15 become specific.

16 I don't have the same problem as
17 apparently other people do with specificity in this
18 case, because the argument always is, if it doesn't
19 apply, if by some miracle DOE has come in and
20 ignored 10 years' worth of interaction with the
21 staff, or decided that it wasn't very important,
22 fine, the reviewer doesn't have to touch it.

23 CHAIRMAN HORNBERGER: Again, just to
24 push you just a little bit, it almost sounds as if
25 what you would envision is making those model

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1 abstractions sections contain some of what is in the
2 issue resolution reports themselves. I guess my
3 question is, do we need that kind of redundancy?
4 Because we already have the issue resolution
5 documents and agreements.

6 DR. STEINDLER: Well, you can reference
7 it if you like.

8 CHAIRMAN HORNBERGER: Uh-hum.

9 DR. STEINDLER: The thing that concerned
10 me in one of these was that it sounded like the
11 issue resolution conclusions were going to be de
12 facto incorporated into the staff's conclusions of
13 the DOE safety case, and I don't think that is what
14 they ought to do. I think they need to review the
15 situation as DOE presents it and then come to the
16 conclusion. It may be the same conclusion, but it
17 ought not to be automatic automatically.

18 Does that confuse things enough?

19 CHAIRMAN HORNBERGER: No, that's
20 helpful.

21 Are there other comments? Questions for
22 Marty?

23 (No response.)

24 Okay, what we are on schedule to do is
25 to produce a draft letter on the YMRP. We meet in

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1 September in Las Vegas. Our plan, our hope is to
2 approve that letter finally at that meeting. So
3 this is our chance to have some, hopefully,
4 productive discussions to move us from where we are
5 now to where we need to be to have this thing nearly
6 final.

7 We have had an exchange, an e-mail
8 exchange of drafts, and we have this blue letter,
9 draft letter, in front of us. I suppose the first
10 thing I would suggest we do is probably talk a
11 little bit about some overarching issues before we
12 get to the details.

13 So let me comment on the things, in
14 particular, that Marty specifically -- are you
15 trying to get my attention? We don't need to be on
16 the record for this, right? So that finishes the
17 recorded portion.

18 (Whereupon, the foregoing matter went
19 off the record at 1:52 p.m.)
20
21
22
23
24
25

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CERTIFICATE

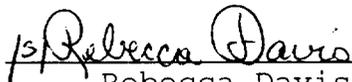
This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of:

Name of Proceeding: Advisory Committee on
Nuclear Waste 136th Meeting

Docket Number: N/A

Location: Rockville, Maryland

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and, thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.



Rebecca Davis
Official Reporter
Neal R. Gross & Co., Inc.

Nuclear Industry Comments on NRC Draft Yucca Mountain Review Plan

Advisory Committee on Nuclear Waste

July 23, 2002

Rod McCullum – NEI



NEI

Yucca Mountain Review Plan

Why Industry is Interested

- Yucca Mountain of strategic importance to industry and our customers
- Effective NRC review is a prerequisite to success
 - Confidence in safety at Yucca Mountain supports continued acceptance of nuclear in general
 - The project's ability to move forward must be supported by a workable approach
- Review plan is a fundamental front-end component of licensing process



NEI

Yucca Mountain Review Plan

Topics of most significant interest to industry

- Adherence to risk informed, performance based principles
- Compatibility with step-wise approach to licensing



Yucca Mountain Review Plan

Other areas of industry interest

- Timeliness in implementation
- Distinction between license review and inspection activities
- Difference between reasonable expectation and reasonable assurance
- Specific comments
 - Terminology / Clarifications
 - Role of pre licensing work in process going forward



A risk-informed, performance based review plan

- Strong Commitment is evident
- Improvements needed to assure effective implementation
 - Recognition that it is up to license applicant to propose risk-informed approaches
 - Less detail / prescriptiveness in some areas
 - Flexibility especially important in step-wise licensing



Implementing the risk-informed performance-based (RIPB) commitment

- NRC should universally focus its review on those elements of the application most important to safety
- Yet the review plan contains many qualifiers
 - Section 1.3 “Developing a Risk-informed, Performance-Based... Review Plan” contains the following statements “the extent to which each of these sections incorporates risk-informed performance-based principles varies” (Section 1.3.1), “This section is risk informed because the option is preserved to retrieve waste” (Section 1.3.2), “Because the performance assessment encompasses such a broad range of issues, the staff will use risk information” (Section 1.3.3), and “Where suitable the acceptance criteria are also risk informed” (Section 1.3.5).
- “Qualified” approach could lead to uneven review



Specific areas where “level of detail” improvement is needed

- **General Information (Sec. 3)**
 - Review too detailed for summary info.
- **Model Abstraction (Sec. 4.2.1.3)**
 - Consistent guidance applicable to all categories of abstraction should replace individualized approach – to achieve flexibility, balance and far less than 109 pages
- **Performance Confirmation (Sec 4.4)**
 - Prescriptive elements removed from draft rule have returned in YMRP
- **Quality Assurance (Sec. 4.5.1)**
 - Strict adherence to QA is a must, provided its the right QA
 - Industry has learned the hard way that over prescriptive QA can be counterproductive



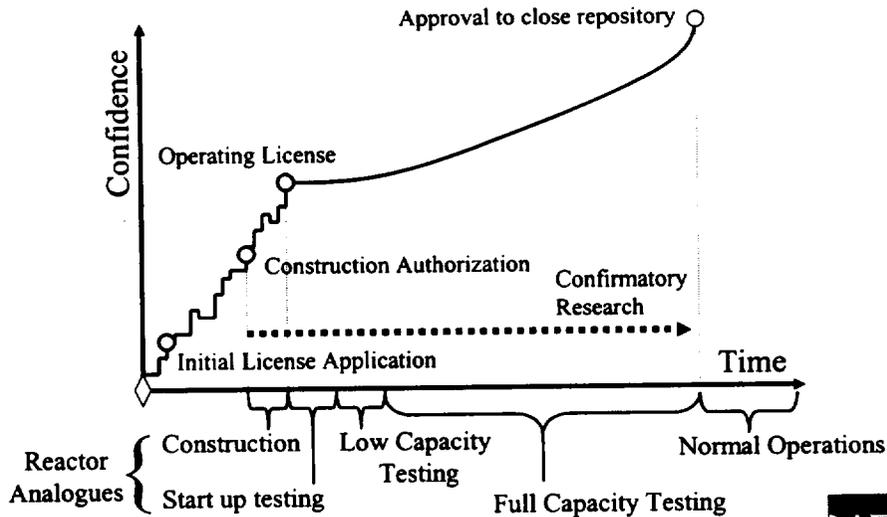
A Step-wise approach to licensing

- “Part 63 provides for a multistage licensing process that affords the Commission the flexibility to make decisions in a logical time sequence that accounts for DOE collecting and analyzing additional information over the construction and operational phases of the repository.”

– NRC 10 CFR Part 63 (Public comment response, FR pg. 55739)



Step-wise licensing



A Step-wise approach to licensing

Key elements in the review plan

- Research and Development Program to Resolve Safety Question (Section 4.3)
 - Should be applied to address issues where agreement with the applicant need not be reached until a later stage when new information will be available
- Performance Confirmation Program (Section 4.4)
 - Should be applied to address issues where agreement has been reached but needs to be maintained as new information is acquired

These elements represent significant and powerful tools for effectively implementing step-wise licensing



Needed improvements relating to Step-wise licensing

- Explicit recognition of step-wise approach and discussion of how the review plan supports it should be added
 - Communicate the “why” behind Sec. 4.3 and 4.4 and the forward-looking context of their use
- Quality Assurance (Sec. 4.5.1) should recognize different phases of project and graded approach as project moves through phases
- Definition of path forward for review plan to be updated as the project evolves



Additional Comments

- Distinction between license review and inspection
 - Section 1.1.1 “Licensing Review Philosophy” does an excellent job of defining this distinction
 - Level of detail throughout review plan needs to match
- “Reasonable Expectation” vs. “Reasonable Assurance”
- Review plan should recognize role of pre-licensing interactions / reviews
- Terminology / Clarifications
 - Meaning of “complete” in acceptance review (Sec. 2)
 - “Important to Safety” & “Important to Waste Isolation” from 10 CFR 63.2, but origin of “Important to Performance” unclear
 - “Bounding Values”, “Multiple Barriers” and alternate uses of “Spent Nuclear Fuel” and “High level Radioactive Waste” need clarification



Conclusion

- YMRP is evidence that NRC has achieved a high state of readiness to review a repository license application
- YMPR contains a strong commitment to risk-informed, performance-based, and step-wise licensing principles
- Specific improvements are needed for NRC to effectively fulfill this commitment

