

ORIGINAL

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Title: **BRIEFING ON PERFORMANCE ASSESSMENT**
PROGRESS IN LLW, HLW, AND SDMP
PUBLIC MEETING

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1 UNITED STATES OF AMERICA
2 NUCLEAR REGULATORY COMMISSION

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4 BRIEFING ON
5 PERFORMANCE ASSESSMENT PROGRESS IN LLW, HLW, AND SDMP

6 ***

7 PUBLIC MEETING
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9 Nuclear Regulatory Commission
10 One White Flint North
11 Rockville, Maryland
12 Friday, July 30, 1999
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15 The Commission met in open session, pursuant to
16 notice, at 9:30 a.m., Greta J. Dicus, Chairman, presiding.
17

18 COMMISSIONERS PRESENT:

19 GRETA J. DICUS, Chairman of the Commission
20 NILS J. DIAZ, Commissioner
21 EDWARD MCGAFFIGAN, JR., Commissioner
22 JEFFREY S. MERRIFIELD, Commissioner
23
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25

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1 STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

2 ANNETTE L. VIETTI-COOK, Secretary of the
3 Commission

4 JOSEPH GRAY, Associate General Counsel

5 FRANK MIRAGLIA, Deputy Executive Director for
6 Regulatory Programs

7 CARL PAPERIELLO, Director, Office of Nuclear
8 Material Safety and Safeguards

9 JOHN GREEVES, Director, Division of Waste
10 Management, NMSS

11 MARGARET FEDERLINE, Deputy Director, Research

12 CHERYL TROTTIER, Chief, Radiation Protection,
13 Environmental Risk and Waste Management Branch,
14 RES

15 NORMAN EISENBERG, Senior Advisor on PA, NMSS

16 KEITH McCONNELL, Chief, PA & Integration Section,
17 NMSS

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P R O C E E D I N G S

[9:30 a.m.]

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CHAIRMAN DICUS: Well I think we're all here.

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Good morning, everyone. It's good to see you. I'm sure we're all bright and alert this morning, and my black eye is beginning to go away, with my confrontation with my horse on Tuesday evening. We got along better last night, so --

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MER: I'd hate to see what the horse looks like.

9

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CHAIRMAN DICUS: The horse is doing well. A little subdued, but doing well. Well, let us get on.

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Today the Commission will be briefed by the NRC Staff on the performance assessment program, and on the progress and the use of performance assessment in the three programmatic areas that are of great interest to this Commission. This areas, of course, are site decommissioning, high-level radioactive waste disposal, and of course, low-level radioactive waste disposal.

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The Staff does brief the Commission annually on the topic of performance assessment. And the Commission was last briefed by the Staff on the subject in June of last year. I think you made it clear to us at last year's briefing that developing a performance assessment model in any one of these three technical areas is a complex and challenging task, and I think the Commission thoroughly recognizes that. However, given that statement, the

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1 development of high-quality performance assessment models
2 for low- and high-level waste decommissioning will enable
3 the Commission to obtain significant quantitative, as well,
4 as qualitative input for making the risk-informed
5 performance-based regulatory decisions on these matters that
6 we face.

7 Now, last year, the Commission encouraged the
8 Staff to continue to develop the performance assessment
9 program and to interact and to share the knowledge gained in
10 this program with others in the NRC, as well as outside of
11 the NRC, who are developing PRA models. Now as I mentioned
12 yesterday, today's briefing concludes a two-part series. It
13 started yesterday when the NRC Staff briefed the Commission
14 on the status of the decommissioning program and the
15 remediation of sites listed in the site decommissioning
16 management plan.

17 So today, we look forward to hearing about new
18 developments that have occurred in the past year in the
19 performance assessment program, particularly as it relates
20 to radioactive waste disposal and the decommissioning of
21 contaminated sites. And as you go through your briefing, as
22 I've mentioned to you in pre-briefs and in individual
23 conversations, the Commission really wants to hear, what are
24 the policy issues? How may they have changed what are the
25 forcing factors that we have to deal with? What are the

1 issues that we may have to have going forward? And what is
2 it you really want us to, to receive out of these briefings
3 and what is it you want us to go forward with and have our
4 understandings?

5 I would ask if my colleagues have any opening
6 statements they would like to make? Commissioner
7 Merrifield?

8 COMMISSIONER MERRIFIELD: I do have a comment to
9 compliment the Chairman and this Staff. I know recently the
10 Chairman had asked the Staff to make a practice of including
11 a list of acronyms in the presentation so that it would make
12 it easier not only to the Commissioners, but more
13 importantly, for our stakeholders in the audience to be able
14 to fully understand what these slides mean. And I want to
15 recognize the fact that the Staff had done that, and I think
16 that's a good practice for us to follow.

17 CHAIRMAN DICUS: Okay, thank you. And we do
18 appreciate that very much. Now I understand copies of our
19 slides are available -- Madam Secretary? -- okay, thank you
20 very much. With that, Mr. Miraglia, if you would please
21 begin.

22 MR. MIRAGLIA: Thank you, Madam Chairman. Good
23 morning, Commissioners. As you've indicated, Madam
24 Chairman, this performance assessment program will form a
25 base for us risk-informing and our materials program. NMSS

1 sent you a plan in the spring of the year, and this forms a
2 substantial base for any implementation of that
3 risk-informing and materials program.

4 Today, with me at the table is Dr. Paperiello, the
5 Director of NMSS; Ms. Margaret Federline, Deputy Director of
6 Research; Ms. Cheryl Trottier, there to my right. To my
7 left is John Greeves, Division of Waste Management; Norm
8 Eisenberg, Senior Adviser on Performance Assessment and the
9 principal briefer today, also from NMSS; and Mr. Kieth
10 McConnell, who's the Chief of the Performance and
11 Integration Section.

12 I'll turn the briefing over to Norman.

13 MR. EISENBERG: Thank you. Good morning -- slide
14 2. Why don't we go to slide 2. That's the outline of the
15 presentation. I'll begin as usual by defining performance
16 assessment to set a context for the briefing. Second, for
17 each of the Division of Waste Management program areas, I'll
18 describe the PA program, including recent accomplishments
19 and planned activities. As you mentioned, Division of Waste
20 Management has PA activities directed towards high-level
21 waste, low-level waste and decommissioning.

22 Cheryl Trottier will then briefly describe support
23 for PA from the office of Nuclear Regulatory Research.
24 Although this support is mainly directed as decommissioning,
25 some research activities have broader implications,

1 implications in the other areas. And finally, I'll
2 summarize. Slide 3 is the list of acronyms for the
3 convenience of the Commission and the audience.

4 And slide 4 is the definition of performance
5 assessment. Performance assessment is a type of systematic
6 safety analysis that explores for waste facility, what can
7 happen, how likely it is to occur, and the consequences of
8 the occurrence. And in this regard, as I've mentioned in
9 the past, PA is consistent with the Kaplan Garret triple-use
10 of defined risk.

11 Performance assessment is also, has an integrating
12 function. And it integrates information across a wide
13 variety of disciplines that are required to analyze the
14 performance of a waste facility or for site decommissioning.
15 These disciplines include such things as corrosion science
16 and geochemistry, hydrology, heat transfer, rock mechanics.
17 I could go on.

18 In addition, PA integrates information across
19 program areas, so it integrates information about the design
20 of the facility, site characterization and certainly the
21 analyses that have been done.

22 The term "performance assessment" is used in the
23 Division of Waste Management, and NMSS for that matter,
24 encompasses a broad range of quantitative analyses applied
25 to waste disposal facilities and site decommissioning. And

1 these analyses are typically matched to the need. So we
2 have a great many deterministic bounding analyses used for
3 simple situations. Less often, we used ballistic analyses
4 on complex facilities or complex issues.

5 The next slide begins the discussion for each of
6 the three program areas, and the major focus for performance
7 assessment and decommissioning has been the continuing
8 development of the standard review plan to implement the
9 license termination rule.

10 Dose modeling is the key aspect for this guidance.
11 The NMSS and research Staff, and their contractors, are
12 cooperating in the development of this guidance. A variety
13 of draft guidance either has been provided or is about to be
14 provided to stakeholders. For example, a table of screening
15 concentrations for building contamination for beta and gamma
16 emitters was published in the Federal Register in November
17 of 1998. An additional table of screening concentrations,
18 removing unnecessary conservatisms where appropriate, is
19 planned, which will be discussed later in the briefing.

20 The review guidance on buried sources was provided
21 to the Regions in March of '99, and the guidance on some
22 aspects of the standard review plan not related to the dose
23 modeling were provided to the stakeholders at the June 23-24
24 workshop that was held here, and they've also been posted on
25 the web.

1 There are a lot of other documents related to
2 decommissioning that are posted on the web -- Draft Guide
3 4006, draft NUREG 1549 -- a lot of background material
4 related to license termination is available.

5 The final version of the standard review plan,
6 using the latest models and stakeholder input, is planned
7 for issuance in July of 2000.

8 The next slide -- an important part of the
9 decommissioning approach is the framework for structured
10 decision-making related to decommissioning. Now, it has
11 been undergoing tests and is being implemented in a computer
12 code called SEDSS, which is a computerized platform for dose
13 modeling and decision making. A specific pacework is
14 proceeding or is on hold, pending submittals from licensees.
15 And mainly what we're waiting for are site decommissioning
16 plans.

17 The decommissioning management board is
18 coordinating among various NRC organizations and reviews the
19 modules or the elements that go into the standard review
20 plan. And the Office of Research is pursuing enhancement of
21 the dose modeling codes D and D, which was originated at NRC
22 and RESRAD, which was originated by DOE.

23 The next slide -- the standard review plan has
24 been developed with an awful lot of stakeholder involvement.
25 The workshops have had heavy participation from the

1 regulated industry. In addition, there's been attendance by
2 other Federal agencies, state agencies --

3 COMMISSIONER MERRIFIELD: Excuse me -- I'm sorry.
4 I'm not sure we have the correct slide.

5 CHAIRMAN DICUS: Yeah. Slide 7 please.

6 MR. EISENBERG: Slide 7. Okay. And we think,
7 also, some environmental activists. The table on this slide
8 shows the dates and subjects of several previous and two
9 planned public workshops.

10 Now I'd like to go on and give two examples of how
11 this expensive stakeholder involvement has helped the Staff
12 improve their technical approaches in those modeling.

13 So, the next slide -- slide 8. The first example
14 is the choice of the value for re-suspension factor in the
15 building occupancy scenario. In the SRM that the Commission
16 issued, the Staff was asked to investigate unnecessary
17 conservatism in D and D. And the NMSS and research Staffs
18 have been doing just that. The issue for re-suspension
19 factor is that it is the sole random variable used in the
20 dose model influencing inhalation dose, especially for alpha
21 emitters. And the Staff -- and it was felt that it might be
22 a value that was too large. The Staff requested
23 stakeholders to provide data on the re-suspension factor at
24 public workshops. And in fact, additional data were
25 provided by two industrial organization. The result is,

1 based on the data provided by the stakeholders, the
2 re-suspension factor was revised downward, which we believe
3 produces more realistic dose estimates.

4 That data, I should add, were acquired by two NRC
5 licensees under an NRC-approved QA program. However, the
6 data and the analysis of the data has not yet been published
7 in the peer review literature, but I believe the Staff is
8 intending to do just that.

9 Slide 9. This shows how -- I guess I got it
10 backwards -- the increase -- I had it right. The
11 re-suspension factor increases, but the limiting
12 concentration goes down -- I'm sorry goes up when the
13 re-suspension factor is applied. So for a concentration
14 equivalent to 25 millirem, the concentration increases by a
15 factor of 18 to 20 for these two important alpha emitters,
16 the uranium and thorium.

17 Slide 10. A second example, how the stakeholder
18 input helped the Staff sharpen its guidance is the screening
19 values for soil contamination in the residential scenario.
20 And the issue is that the algorithm used by the developers
21 of the code defined default parameter values was done in a
22 way that was applicable for the aggregate of all the
23 radionuclides, and that produced some unnecessarily
24 conservative values for concentrations for some of the
25 radionuclides. Well, the stakeholders at the public meeting

1 indicated problematic results for some of the nuclides that
2 are important for reactor decommissioning -- Cesium 137 and
3 Strontium 90. And as a result, the Staff will public a
4 table of screening concentrations that are applicable for
5 each radionuclide, instead of the aggregate, to reduce this
6 unnecessary conservatism.

7 The next slide shows a table that compares the
8 anticipated concentrations from D and D version versus the
9 concentrations sort of produced by version 1. These are the
10 concentrations equivalent to 25 millirem, and as you can
11 observe for some radionuclides -- for example, Cobalt 60 --
12 the change is small. However, for other radionuclides, the
13 changes is larger -- a factor of 4 for Strontium 90; a
14 factor of 12 for Cesium 137; and a factor of 28 for Uranium
15 238.

16 Now, Cheryl Trottier will discuss some of the work
17 by research supporting principally decommissioning, and
18 she'll begin with slide 12.

19 MS. TROTTIER: Good morning. What I'd like to do
20 is briefly run through the kinds of activities that research
21 is engaged in to support NMSS in this program. And I
22 thought it might be useful to begin with a little history
23 about D and D. It's important to remember that D and D was
24 developed as a screening model. It was developed a number
25 of years ago, with the concept that the results would be

1 prudently conservative.

2 In refining the code to put it out for use by
3 licensees, we probably put in a little more conservatism in
4 the generation of the default parameters than was really
5 necessary, so you ended up with a compounding conservatism
6 issue. When licensees pointed that out to us, then we went
7 in and have initiated changes in D and D that will rectify
8 that. And I think you see that in the table that Norm
9 showed you in the previous slide.

10 Now, we're calling this a toolbox because D and D
11 is not the only tool that we're developing. There's the
12 basic document that I will refer to, which is NUREG 1549,
13 which covers the decision framework and basically tells
14 licensees to go out and select the model that's most
15 appropriate for their site. And in many cases D and D would
16 not be appropriate.

17 The concept behind D and D in the first place was
18 to have a simple tool that would require licensees to not
19 expend large sums of money to go out and look for data on
20 their site, but they could input basically their source
21 term, what they knew to be their radioactive concentration
22 on the site. And if they pass the screen, no further site
23 gathering of data would be necessary. They wouldn't need to
24 learn soil type, rainfall amount -- all those things that
25 impact dose. So that's the basic reason for it was that it

1 was viewed as a cost-effective tool.

2 We now believe it's likely that only licensees,
3 for instance, in a situation where's there's no soil
4 contamination -- you could envision a research laboratory
5 wanting to decontaminate some equipment in their building
6 that they were going to leave behind. They might be able to
7 use D and D screen and not need to do anything further. But,
8 I mean, that's an important thing to remember. It won't
9 work for everyone.

10 So then the question is, what other tools are out
11 there? And a number of licensees had indicated to us that
12 they were very comfortable and used to using DOE's RESRAD
13 model. And we have gone ahead then and done some work that
14 would help make that a more probabilistic code. Today, it
15 is not set up as a probabilistic. This way, licensees will
16 be better able to use site-specific data and have a handle
17 on the uncertainty associated with those analyses. It will
18 also help the licensing Staff in reviewing applications when
19 licensees use RESRAD. The Staff will have a basis then for
20 evaluating the validity of the site-specific data provided
21 by our licensees.

22 And then the third tool, which Norm has already
23 mentioned to you, is SEDSS. SEDSS is really designed to
24 handle a complex situation. The idea behind SEDSS was that
25 licensees who had significant groundwater contamination

1 issues would have a tool where they could basically develop
2 a conceptual model and then bring in other models,
3 particularly in the area of groundwater, that would more
4 accurately characterize the conditions at their site. Both
5 RESRAD and D and D use a very simple groundwater pathway
6 model, which will tend to overestimate dose.

7 So in all these efforts, our goal is to drive us
8 to the most realistic assessment possible. And with that
9 I'll move to slide 13 and talk about our longer-term goals.
10 The efforts that I just spoke of, we intend to have
11 completed by the end of this year, which is the time period
12 for finalizing guidance to support the license termination.

13 Longer-term goals -- because what we're doing
14 right now particularly in the area of work on D and D
15 involves refining parameter calculations. It doesn't go
16 back to looking at the basic assumptions in the model, and
17 that needs to be done. There are a lot of conservatisms, we
18 believe, in how the model was developed. We'll go in and
19 look at that over the next two- to three-year timeframe. We
20 may in fact be able to remove some of the conservatisms in
21 there that are not appropriate.

22 We're also looking at enhancing our knowledge of
23 flow and transport in groundwater. That's an area which
24 this branch has worked on for quite a long time. And as
25 we're continuing to refine information, that information

1 then can be used to support further development of the SEDSS
2 model.

3 Some of the things that we have done in this past
4 year to support particularly the issue of groundwater
5 transport is we've participated with the National Academy of
6 Sciences on a workshop in March that addressed these
7 different conceptual flow models. And we had PNNL produce a
8 report that would help licensees with different soil
9 textural classes select the right groundwater model. And
10 with that, I'll turn to back over to --

11 COMMISSIONER MERRIFIELD: Before we go to Norm, I
12 would just, in response to the, the terms -- admonitions to
13 try to identify the focus that we'd like the Commission to
14 have in this area. What you heard from yesterday was the
15 license termination rule, and we have a standard, and that
16 standard has been set up. What we're talking about now --
17 how does one implement that standard, and the dose models or
18 the tools that we're going to translate, the measurement
19 data, to come to decisions, is that criteria being met?

20 And in terms of policy issues that are on the
21 table right now with respect to the modeling, I think what
22 we're doing was going forward and implementing the
23 Commission's direction to go to realistic modeling, to make
24 it so there's no unnecessary burden and it's commensurate
25 with the risk to the public health and safety.

1 Now, in that context the Commission also asked us
2 to reach out to stakeholders, and I think in that context,
3 we're also doing that. Now there will be policy issues that
4 are perhaps at a lower tier in terms of, did we make the
5 right assumptions in terms of suspension factors and these
6 kinds of things? And that may come out of the interactions
7 that we have with stakeholders and other issues -- do we
8 agree that those are the appropriate models by which we're
9 going to demonstrate that the standards are being met and
10 therefore decisions to be based on.

11 And I just want to provide that overall context in
12 response to the Chairman's initial admonition.

13 CHAIRMAN DICUS: If I could just add one quick
14 point. The challenge that we face -- and I think the
15 Commission commented on holistically combining our four
16 goals and looking at them holistically. What we want to do
17 is ensure that we're reducing the amount of burden on
18 licensees, while still providing them the flexibility to add
19 as much site characterization data as they have, because
20 site characterization data is very expensive to incur. And
21 if a simple model can be used, even a conservative simple
22 model in some cases, it protects safety as well as
23 minimizing burden. So we're sort of faced with that
24 challenge of balancing as we, as we go through the process.

25 COMMISSIONER MERRIFIELD: And then the stakeholder

1 interaction is again, there's a broader understanding.
2 There may not be uniform agreement by all, but at least it's
3 out there. It's been discussed in public forums. Everyone
4 understands it. And we will incorporate that into the goal.
5 The primary goal is to have an SRP by which we're going to
6 make the decisions that the license termination rule and
7 standards are being met.

8 CHAIRMAN DICUS: Okay. Well, I appreciate that
9 input. I think we said yesterday, we recognize we're
10 probably writing the textbook; when we get to the end of it,
11 we just want to be sure we have a good textbook. I
12 appreciate that input. Okay.

13 COMMISSIONER MERRIFIELD: Return to Norm.

14 MR. EISENBERG: Okay, thank you.

15 Slide 14 begins the discussion of performance
16 assessment in the area of high-level waste. A major focus
17 of PA and high-level waste has been the improvement of the
18 total performance code, the TPA code. The latest version of
19 the code has added flexibility to evaluate new features of
20 the DOE design -- for example, grip shields, inverts, and
21 the choice of C22 as the material for the waste package.

22 There is a continuing effort to reduce unnecessary
23 conservatisms -- for example, in the approach to seismicity
24 effects. And the Staff has begun an external peer review
25 with a kick-off meeting earlier this week at the Center in

1 San Antonio. This year the Staff has completed a series of
2 total system and subsystem sensitivity analyses, which help
3 focus our efforts on the most significant issues and is an
4 aid to integrating the high-level waste program. And these
5 were published in a two-volume set of NUREG 1668.

6 The code and the Staff uses of it have provided
7 significant insights used in interactions with DOE,
8 including comments on the total system performance
9 assessment for the viability assessments, the TSPA-VA. For
10 example, we calculated a much smaller mean waste package
11 lifetime than DOE.

12 And further improvements in the code are planned
13 prior to receipt of the license application. For example,
14 incorporating alternative conceptual models for release of
15 radionuclides from spent fuel to the groundwater. Slide 15,
16 please.

17 Another important focus for performance assessment
18 this past year has been the development of draft Part 63,
19 proposed Part 63, NRC's site-specific rule for Yucca
20 Mountain. The rule, which was published in the Federal
21 Register on February 22, 1999, is a risk-informed
22 performance-based regulation, which relies very heavily on
23 performance assessment. The performance assessment context
24 -- terminology results in techniques and insights provide an
25 important support for a number of issues associated with the

1 rule, including communicating with stakeholders about the
2 rule, about things like exposure scenarios, the relative
3 roles of the engineered barriers and the geology.

4 Finalizing Part 63, we expect to use some PA
5 insights for that, and we also expect to use it to evaluate
6 the site-specific rule, which is expected to be proposed
7 sometime by the Environmental Protection Agency. Slide 16.

8 Another example of how the Staff technical
9 approaches have profited from stakeholder interactions are
10 technical issues brought up at public meetings on the
11 proposed Part 63. For example, the Staff is engaged in an
12 extensive evaluation of how to approach defense in-depth for
13 this risk-informed performance-based rule. The plan for
14 this evaluation was recently forwarded to the Commission in
15 SECY 99-186.

16 Another example is the protection of children and
17 infants. The Staff is exploring technical approaches which
18 will ensure an appropriate degree of protection. And
19 although the Staff stated in the statement of considerations
20 for the proposed Part 63 the belief that an all-pathway
21 standard would be sufficiently protective of groundwater
22 resources, various stakeholders have challenged this view.
23 And the Staff is evaluating the concerns about this view and
24 the technical basis for supporting it. Many other topics,
25 as you can see, have also been brought up and will be

1 addressed in finalizing the Rule.

2 Slide 17. This year, of course DOE completed the
3 viability assessment and an extensive total system
4 performance assessment, which was incorporated as part of
5 it. The NRC PA Staff met with the DOE at a technical
6 exchange and a technical information meeting, a so-called
7 Appendix 7 meeting. In addition, the PA Staff participated
8 in many other meetings for which other program elements in
9 the high-level waste program had the lead.

10 Several positive aspects of DOE's TSPA are the
11 data collection, the data synthesis, the PA modeling, and
12 the documentation of results. However, there are some
13 questions that remain. The Staff still has questions about
14 waste package corrosion, which is a critical element in the
15 DOE's performance of the repository. Another question
16 regards the quantity and chemistry of water contacting waste
17 packages and contacting the waste itself. This has a
18 profound effect on the rates of waste package corrosion, and
19 the rate of waste form dissolution. And another example is
20 saturated zone flow and transport, which appears to be one
21 of the most important natural barriers in the repository
22 system, especially in the context of the new rule.

23 Slide 18. Additional progress in high-level waste
24 PA was made by issuing revision 1 of the Issue Resolution
25 Status Report for Performance Assessment, which provides the

1 technical basis for the Yucca Mountain review plan. We have
2 endeavored to develop improved methods for displaying
3 performance assessment results, and these efforts have been
4 strongly encouraged by the AC&W, and we are developing the
5 Yucca Mountain review plan.

6 In addition, we have published a sizeable number
7 of reports and papers, several in the peer review
8 literature. An example near and dear to me is a joint white
9 paper we published with SKI, which is the Swedish Nuclear
10 Power Inspectorate on the validation strategy for
11 performance assessment models. This would be a strategy
12 that the licensees would use to show a degree of support for
13 their models used in their performance assessment.

14 Slide 19. Low-level waste continues to be the
15 smallest programmatic effort for performance assessment.
16 It's directed at assuring state capabilities in performance
17 assessment through IMPEP reviews. For example, we
18 participated this month in a review for South Carolina and
19 are planning to participate in one for the State of
20 Washington in August.

21 Also, we're planning to complete and are working
22 on completion of or finalization of the branch technical
23 position, which was issued in draft and we've enlisted the
24 aid of contractor to help us on that.

25 So now I'd like to move on to a summary and look

1 forward. For decommissioning, the main focus will be
2 development of the standard review plan. By FY2000, with
3 some interim guidance such as the screening tables issued
4 sooner. In addition, the draft reg guide and NUREGS issued
5 by the Office of Research will be reissued as final. The
6 ongoing case work is being coordinated with the development
7 of the standard review plan to minimize inconsistency with
8 licensing decisions made in this interim period, and how the
9 standard review plan ends up.

10 The main focus for high-level waste PA will be to
11 provide input to regulatory products such as the Yucca
12 Mountain review plan. And will continue focused
13 improvements in the Staff PA capability. That's the code
14 and the Staff training and expertise.

15 And finally -- last slide -- the near-term focus
16 for high-level waste is finalization of part 63.
17 Interaction of DOE on their PAs for, the Pas site
18 recommendation and ultimately for the license application.
19 And certainly the Staff is preparing to review the license
20 application performance assessment. The focus for low-level
21 waste PA is completion of the branch technical position.
22 Thank you very much.

23 CHAIRMAN DICUS: Thank you, Mr. Eisenberg. We've
24 moved through that swiftly, so now we have sufficient time
25 for comment and discussion and questions that may come up.

1 I'm going to start with just a couple, and then I'll pass
2 the baton to my fellow commissioners.

3 You mentioned a number of decommissioning
4 documents very early on in the presentation that had been
5 developed or were in the process of being development. And
6 I guess my question goes to, are these all coordinated? Do
7 they -- I mean, do they have common ground in some cases?
8 Obviously they will have differences in other cases, but are
9 they pretty well in sync with one another, or are there any
10 conflicts that may be when you have so many difference
11 guidance documents out on the street on these issues. If
12 you could comment on that.

13 MR. EISENBERG: Okay, recognize that these
14 guidance documents have been developed over -- I think,
15 starting in 1992, in that period. And so there's a time lag
16 phenomenon. So we're developing a standard review plan with
17 a lot of interaction with stakeholders. And so, we are
18 reconsidering some of the issues and our technical
19 approaches. And as a result, some of the thing in the draft
20 standards review plan. I don't believe anything has been
21 issued so far, but some of the material that's being
22 developed may be in conflict with previously issued guidance
23 documents. But the intent is to update those documents as
24 appropriate in about the same timeframe.

25 MR. MIRAGLIA: I think, Madam Chairman, the

1 process that we're engaged in will reach the goal that I
2 think you're suggesting in your question, of codifying and
3 re-examining that.

4 CHAIRMAN DICUS: Right.

5 MR. MIRAGLIA: And as Norman has just pointed out,
6 in terms of the technologies changing, we would have to
7 align the guidance to the SRP criteria. I think that's the
8 ultimate, the goal in terms of decommissioning guidance.

9 CHAIRMAN DICUS: Okay. On the SRP, with regard to
10 the license termination rule and the decommissioning SRP,
11 with regard to that, I think I'm referring to slide 5, I
12 think at this point. There appears to be, based upon the
13 information that was in SECY 99-035, I think it is, there
14 appears to be a four-, five-month delay in getting the SRP
15 out. Is there any -- is there some technical reason or some
16 problem that, or is it just slippage and Staff having the
17 time to do it? Could you give me a little information on
18 that? I think you planned to issue it in July of 2000, and
19 I think previously it was to be released in the early spring
20 of 2000.

21 DR. GREEVES: Okay. I don't have all those in
22 front of me. I'll take a run at it. We gave the Commission
23 a paper late in '98 on the standard review plan schedule.
24 And in that paper, it indicated that -- and Keith, help me
25 out here -- it indicates that we'd get it all done by July

1 2000. We've had some trouble with the dose modeling topic.
2 We've lost some key Staff. And it's a bigger challenge than
3 maybe we anticipated originally.

4 So I think our best statement is the end date that
5 we gave you back in last '98. We're shooting for July 2000,
6 to have them all come together. There's been some slippage
7 on the dose modeling front, principally because we lost some
8 key Staffers. They were very valuable to us, and it's a
9 little bit more difficult. This is run out of Keith
10 O'Connell's section. I'd ask him to add anything he could
11 to that process. We will have a standard review plan and it
12 will have dose modeling in it, in that time frame. That is
13 not to say that it won't be improved, just like all of our
14 other standard review plans in the Agency over time.

15 Cheryl mentioned some longer-term things that have
16 kind of come forward, but we will have enough in July 2000
17 to conduct those reviews. In fact, we're using that kind of
18 information now. Keith, can you supplement what I said
19 here, or correct directly to Faye?

20 MR. MCCONNELL: No, you've touched all the bases.

21 MS. FEDERLINE: The thing that has to be
22 recognized is that there was a framework set in place at the
23 beginning of this initially, of how we were going to tackle
24 this. You know, we were going to have a screening model at
25 the beginning, conservative. And then we were going to add

1 other tools to our tool box as we went along. And there's
2 always been sort of a long-time horizon for completing the
3 most complete of those models. And our toolbox really won't
4 be complete until we have SEDSS. But we believe we'll have
5 the essential elements which will make it simple and
6 possible for licensees to implement the license termination
7 rule in the July timeframe.

8 CHAIRMAN DICUS: Okay. Thank you. Have we been
9 able to get some good Staff back that we lost?

10 DR. GREEVES: We've done very well in about the
11 last quarter. We've hired on about ten people in the
12 division that I'm really excited about. But as you know,
13 when you bring new people on, they need to know what your
14 job is, what your procedures are. So we're just about up to
15 -- in fact, I'm trying to go over my limit with Carla. But
16 I'm feeling better now, but --

17 CHAIRMAN DICUS: Are you going to let him go over
18 the limit?

19 [Laughter.]

20 DR. GREEVES: I guess I'll get calibrated later.

21 MR. MIRAGLIA: Carl has maximum flexibility within
22 the total bounds of his FTE.

23 [Laughter.]

24 CHAIRMAN DICUS: Okay, Carl. You wanted to say
25 something?

1 MR. PAPERIELLO: To get back to you original
2 question, the documentation on the guidance has evolved
3 because actually the promulgation of a rule by the
4 Commission does focus the private sector. And so the tools
5 are changing. So, you know, we put out a guide on detection
6 methods a couple years ago; well, the private sector's
7 moving on. This year's health-physics meeting was heavily
8 devoted to decommissioning and the instruments are
9 improving. So therefore, things are changing.

10 The standard review plan -- it is my intent to
11 capture and integrate all the guidance that we have put out
12 to date at the time we issue it. However, we've got to
13 recognize -- and we're getting a lot out of these workshops
14 -- we're focusing the private sector's resources on a target
15 and a goal. And you know, I think when you think of
16 risk-informed performance-based, I think the performance
17 needs to come from the industry, and I think the dynamics --
18 at Maine Yankee, they're proposing a rubblelization. That's
19 a concept we never envisioned. And that obviously is going
20 to inform the standard review plan. When we know enough
21 about what they're going to do, you will get a paper from us
22 because we will be engaging you in policy decisions on that
23 particular disposal methods.

24 That is going to be discussed at a workshop later
25 this month. So it, you -- this is a policy issue that you

1 will need to consider. And you will probably get a paper on
2 it by the end of this calendar year, once we get enough
3 concrete information --

4 CHAIRMAN DICUS: Okay, we'll speaking of limits,
5 I've run over my five minutes. So I'm going to ask
6 Commissioner Diaz if he has any comments, but I may have a
7 couple of more questions when we redirect.

8 COMMISSIONER DIAZ: I guess we are driven by time,
9 not numbers of questions.

10 [Laughter.]

11 CHAIRMAN DICUS: Both.

12 COMMISSIONER DIAZ: Both, I see. Real quick then,
13 let me just make a statement, just to make sure that I
14 understand now -- we keep saying that we're gonna have a
15 very realistic dose modeling, and that's been a driving
16 factor. We have looked, talked about performance
17 assessment, so can we -- you just said that you were going
18 to have some risk-informed conservatism in your dose
19 modeling -- is that the right way of saying it? Okay, based
20 on that, of course, uncertainty is inversely proportional to
21 those, meaning that the lower the dose, the more the
22 uncertainties are. That's standard; I mean, I don't think
23 it has changed. You know, as you go lower and lower, you
24 know, you get into entire uncertainties. Of course, the
25 uncertainty of the lower and lower dose is no less important

1 than as the uncertainty of the higher and higher dose. Is
2 that correct?

3 DR. GREEVES: Yes sir.

4 COMMISSIONER DIAZ: And so, when we are putting
5 models and trying to bound them into usable, practical,
6 accessible models, there is a point at which the dose gets
7 too low to actually, you know, make realistic, you know,
8 estimates on it. And in this case, it's for our purpose of
9 safety and health. When they get so low that they do not
10 impact on the total dose, then that's the time to quit.
11 We're not going to keep driving at, at, you know, several --
12 is that correct?

13 DR. GREEVES: Right.

14 COMMISSIONER DIAZ: All right. Having understood
15 that, that there is a diminishing return as you go lower and
16 lower in dose, and to keep it realistic, that's something
17 that I needed to know. In that context, I have a series of
18 questions -- and I'm looking at my time.

19 CHAIRMAN DICUS: We don't have a light system.

20 COMMISSIONER DIAZ: No, no. But we should.

21 [Laughter.]

22 COMMISSIONER DIAZ: This June 23-24 groundwater
23 modeling workshop -- did EPA participate in that?

24 DR. GREEVES: yes, they did. They made a
25 presentation.

1 ME. EISENBERG: Yes.

2 COMMISSIONER DIAZ: I notice that we have made a
3 series of changes in conservatism -- re-suspension factor.
4 We're not, you know, using codes that are a little more
5 accurate in groundwater. Was there any problems, comments
6 or agreements? When we talk about, you know, how we're
7 doing things with EPA, was there a strong disagreement
8 stated?

9 MR. EISENBERG: No. In fact, we shared that table
10 that we talked about yesterday and today before we issued
11 it. They're in the ISCORS format. And I think Cheryl
12 mentioned yesterday, almost all this material runs through
13 the ISCORS Subcommittee.

14 COMMISSIONER DIAZ: Right. So there seems to be a
15 convergence into, you know, what are the --

16 DR. GREEVES: On some things.

17 COMMISSIONER DIAZ: -- reasonable models and
18 quotes and things. Yes?

19 DR. GREEVES: The 15 and 25 is still an issue.

20 [Laughter.]

21 CHAIRMAN DICUS: We haven't been able to get rid
22 of that, have we?

23 COMMISSIONER DIAZ: We understand that. I didn't
24 bring that up. I take that off my time.

25 [Laughter.]

1 CHAIRMAN DICUS: Okay, you guys. Come on.
2 Actually, I have one less question now, because he just
3 asked it for me.

4 MS. TROTTIER: I'll just enhance on what John
5 said. I chair an ISCORS subcommittee, the clean-up
6 subcommittee, and our goal for this year is to produce a
7 document, basically between the three agencies -- DOE, EPA,
8 and NRC -- that will discuss dose modeling, the kinds of
9 things you should expect to find in a model, that --
10 primarily as a tool to help users in selecting a model.
11 We're not going to go as far as Carl would like us to go,
12 which is to come up with set criteria that is agreeable to
13 all. But we believe that this is an area where there is
14 good agreement between the three agencies. It goes a back
15 to the issue of dose assessment versus dose management. And
16 I think we do have agreement there.

17 COMMISSIONER DIAZ: And from my viewpoint, since
18 this is such a national issue, I think that when dose
19 agreements or disagreements happen, let's not wait for a
20 year for till next meeting. It's a simple notice to the
21 Commissioners or the TAs would definitely be appreciated.

22 MR. MIRAGLIA: Absolutely. Would, we would
23 apprise you of the results of the ISCORS in those briefings
24 and those would be significant issues. And in terms of what
25 Cheryl just said, you know, even if we got to where Carl

1 wants to go, where you could even agree on the model, you
2 still have to agree on the standard.

3 CHAIRMAN DICUS: That's a good point.

4 MR. MIRAGLIA: So I mean, there's a hierarchy of
5 decision points. And we're moving; we're converging in some
6 areas, but are we going to get everybody to exactly the
7 point remains to be seen, and the Staff is sensitive to that
8 as well.

9 COMMISSIONER DIAZ: But even before we reach to
10 the point of decision making, I think this is such a
11 national issue that we want a -- going technical, quick
12 here. This enhancement of the Sandia Environmental Support
13 System, to two and three dimensions. The complexity
14 increases with the dimensions. And like I said, there's
15 diminishing returns as the, as the dose gets lower.
16 Somebody's going to bound this for us. Is it going to bound
17 by next year? July 2000?

18 MS. TROTTIER: When you move into those two- and
19 three-dimensional models, my guess is, we're talking more a
20 two- to three-year timeframe for that.

21 COMMISSIONER DIAZ: That's fine.

22 MR. MIRAGLIA: But the goal, Commissioner is, we
23 have the screening. If the screening fits, then it's
24 commensurate and they don't need to go farther. If they
25 can't meet the screen, there's be some tools that they can

1 look at even more and then we're going to try and enhance
2 those new tools even further, just as Carl and John have
3 indicated previously.

4 COMMISSIONER DIAZ: Probably the last one on this
5 round. In the previous meetings, I we always have this
6 difference between DOE dose modeling and ours -- to two
7 hours of tours of magnitude, and we have asked the Staff to,
8 you know, are we converging? Are we diverging? You know,
9 what is happening?

10 And this issue I remember clearly, it came out two
11 years ago. We asked specifically the Staff to keep us
12 apprised of that. Where are we? Are we converging? Are we
13 still separated by one to two hours of magnitude? Have we
14 resolved it? And if not, will you please let us know when
15 you're going to resolve it?

16 MR. EISENBERG: Well, I think it's important to
17 say that, you know, the purpose for the NRC Staff to engage
18 in an independent performance assessment is in part to check
19 the calculations of DOE. But if our calculations still meet
20 the standard and we use more bounding assumptions, and
21 therefore there are higher doses, that gives us confidence
22 that what DOE has presented is okay. So I'm not sure we have
23 to have exactly the same numbers, as long as we know we have
24 more conservative, in some sense, models. And we're almost
25 forced to be more conservative because we don't have the

1 resources that DOE does to do the very detailed modeling.
2 So we have to make simplifying assumptions. And being
3 regulators, the assumptions quite often conservative.

4 COMMISSIONER DIAZ: I never said that that we have
5 to have the same -- all I said was that the Commission
6 wanted to know what the difference was, where the difference
7 was coming from, and if it's well explained, we are willing
8 to live with the difference. That's all.

9 MR. EISENBERG: And, and we still have
10 differences. And I believe the primary difference currently
11 is due to the estimates of the corrosion for the waste
12 package. That has a profound effect on the doses. And DOE
13 is assuming a more optimistic model than we have. I suppose
14 also, they are assuming better performance for the saturated
15 zone than we are.

16 MR. MCCONNEL: There's one other area, and that's
17 the consideration of initial failures or initial defective
18 waste packages. We assume a much larger number of initial
19 failures than DOE assumes one, and that becomes important
20 when you think of a 10,000-year timeframe and a waste
21 package materials that lasts for tens of hundreds of
22 thousands of years. I'm finished.

23 MR. PAPERIELLO: I want to add to that, because
24 there's not just high-level performance assessment with
25 decommissioning. And I think that there have been intensive

1 inter-comparisons, particularly of our code, D and D and
2 RESRAD, as well as some codes used by the EPA and other
3 people. And I would say we are converging. And not only
4 that, we are understanding the differences and we're
5 understanding -- the practical matter, I'll give you a
6 matter, building, contamination of the building. Both
7 RESRAD build and D and D are both conservative. Now the
8 issue is understanding how they handle the conservatisms and
9 get an agreement on what to do. But I would say compared to
10 a year ago and the papers I saw in the health-physics
11 journals as the meetings compare to this here, we're
12 converging.

13 COMMISSIONER DIAZ: And my point is that that is
14 important to the Commission and that we need to know that.
15 And we need to know if, does matter that is timely so in
16 case we need to use that information that we have it
17 available.

18 CHAIRMAN DICUS: Thank you. Commissioner
19 McGaffigan?

20 COMMISSIONER MCGAFFIGAN: Let me first follow up
21 on a question the Chairman asked with regard to the SRP
22 development. One of the back-up slides outlines the 16
23 chapters. And one of them is on dose modeling and describe
24 the key Staff that you had lost there. But there are five
25 other chapters that haven't been yet distributed for draft,

1 some of which would look relatively straightforward --
2 radiation surveys, financial assurance, etc. How, what is
3 the schedule for getting these out for comment?

4 MR. EISENBERG: Three of them have already been
5 completed and are ready to go to the web. I believe that's
6 -- Mike, can we have -- we might as well put up the slide.
7 Slide 34.

8 CHAIRMAN DICUS: No, that's not it. We need slide
9 34 please. It's a back-up slide.

10 MR. EISENBERG: It's the one after that one, Mike.
11 There we go.

12 CHAIRMAN DICUS: Okay, thank you.

13 MR. EISENBERG: So, 10, 14 and 15 are about to go
14 out. And the remaining three are under an internal review
15 currently. So it should be soon.

16 COMMISSIONER MCGAFFIGAN: Looking at the EPA
17 comments on Part 63, a theme that runs through it is they
18 think that you all are likely to select worst-case values
19 for important parameters and this will drive you to
20 unnecessary conservatism. I'll just read -- this partly
21 comes up in relationship to reasonable assurance versus
22 reasonable expectation.

23 But at one point they say, "We believe that the
24 connotation, which is developed around reasonable assurance,
25 could lead to an extreme approach to selecting worst-case

1 values for important parameters. For example, precipitation
2 rates, seepage rates, flow in the unsaturated zone, coupled
3 with an equally extreme approach in selecting engineering
4 barrier performance factors, would lead to assessments that
5 represent situations with little or now probability of
6 occurring, but which become the basis for licensing
7 decisions."

8 How do we protect against that? I mean, you talk
9 about trying to have reasonable barriers --

10 MR. MIRAGLIA: You're asking us to provide a
11 comment on Part 63, and I'm a little uncomfortable doing
12 that, but let me give you some context of how I would answer
13 that question. And I m going to put my foot in the Staff's
14 mouth and they can scream relative to that.

15 The point is that reasonable assurance, in terms
16 of what is reasonable assurance going to mean for Yucca
17 Mountain -- that's the whole purpose of Part 63. In Pat 63,
18 we're establishing a standard. And in the context of that
19 standard, we're developing the Yucca Mountain license review
20 plan. The SRP by which we're going to articulate how we're
21 going to articulate, how we're going to demonstrate that
22 that standard is being met. So in that kind of context, I
23 think that's the frame work, how reasonable assurance for
24 Yucca Mountain is going to be defined. And I think we need
25 to articulate, that's what our process has been in terms of

1 reasonable assurance for reactors. We have our rules, we
2 have our SRP and we have our reg guides. And that body of
3 information says, here's how we're going to make the
4 licensing decisions.

5 Part 63 will establish reasonable assurance. Now
6 if -- and EPA, perhaps in their jargon and their rulemaking
7 has that term reasonable expectations --

8 COMMISSIONER MCGAFFIGAN: I'm not trying to get at
9 the reasonable assurance versus reasonable expectations. I,
10 the thrust of their comments -- and they make them several
11 times -- on intrusion, they comment that our standards that
12 we have in the rules --

13 MR. MIRAGLIA: And if we go through the slide on
14 high-level waste, it talks about how performance assessment
15 is going to be used to be able to model intrusion,
16 groundwater flow, and those significant kinds of things.
17 And that'll all be incorporated in terms of the key
18 technical issues that we're resolving with DOE in a public
19 forum.

20 And the licensee review plan will be out there so
21 that all of that will be out there and say, this is the mix.
22 This is the standard. This is how we're going to evaluate
23 that standard, and this is the acceptance criteria we're
24 going to use to make the judgment that the standard's being
25 met. And so, that's the process.

1 COMMISSIONER MCGAFFIGAN: But I think what they're
2 essentially saying -- I mean, it just goes to this issue of
3 conservatism. I'm not trying to get into reasonable
4 assurance or reasonable expectation or whatever. It's
5 conservatism. They claim that our hundred-year period for
6 the intrusion or reasonable, but simply unrealistic.

7 MR. MIRAGLIA: You're right. But that goes to the
8 models. What's the assumptions of the models? And that'll
9 be done in the forum. We'll put it out there and
10 everybody'll have an opportunity to comment on it. And they
11 can talk to whether those assumptions are overly
12 conservative or not. And it's in that development and
13 interaction by which we're gonna come to those places.

14 MR. EISENBERG: Could I just add something, that
15 in the proposed rule anyway, that seems to be at variance
16 with what you read. The performance measure is the mean of
17 the dose. The mean of the dose, taking into account the
18 probability of the scenarios and the probability of each
19 realization, meaning if Monte Carlo sampling of the
20 parameters. So it is the expectation value. And it does
21 not look at extreme values for parameters in order to make a
22 dose estimate. It's very explicit. It's looking at the
23 expectation value. So I'm not sure what the basis is in
24 that context for making this kind of statement.

25 DR. GREEVES: Let me add also -- others are around

1 the table sitting on these meetings -- EPA does not have a
2 large presence in our interactions with DOE in the technical
3 meeting. I'm not sure what their basis for making this
4 comment is. As much as we'd like for them to show up and
5 engage, maybe they're resource-limited.

6 But Keith and Norm, do they sit in on any of our
7 -- I know they have a contractor show up on occasions. I'm
8 trying to get at -- I mean, if I were EPA, and it's clearly
9 an EPA view you all, and it comes up in other contexts in
10 the decommissioning area, that there is a tendency to choose
11 fairly conservative parameter values. They've seen that
12 historically, and they're perhaps just extrapolating here.
13 And I don't know what the basis for the comment is, but it's
14 clearly very strongly held that there is a tendency to turn
15 a 25 millirem standard into a 2.5 millirem standard just as
16 a matter of piling conservative -- even if you're just doing
17 expected values, there's an order of magnitude in one
18 direction.

19 With D and D, we had Carl having problems at the
20 outset because he couldn't predict ERD. As Carl put it, it
21 was a factor of 10 or a hundred too high in predicting ERD.
22 But we're fixing it. But we can fix that because we can go
23 back and get data. And when it's an expected -- when we're
24 doing a performance assessment for 10,000 years, we're not
25 going to be able to check truth values as to what C22's

1 corrosion rate is going to be for 10,000 years because --
2 unless it's going to be 12:05 when we actually license the
3 repository. So I just, I take the EPA comment relatively
4 seriously, that we need, we really need to protect against
5 conservatism, and perhaps there is some history of it. But
6 I'll stop there.

7 CHAIRMAN DICUS: Okay. Thank you. We'll have
8 time to come back to it.

9 MR. MIRAGLIA. I think it goes to what
10 Commissioner Diaz raises, is that one needs to understand
11 what's in the model, what's the uncertainty associated with
12 the model? We have a center down in San Antonio that's
13 looking at lots of these issues in terms of what's the
14 sensitivity? Was our concern about the uncertainty? Then
15 what does that mean to our decision making process.

16 And I think that the review plan that we're
17 putting together and the standard plan that we're going to
18 put together, we'll be able to articulate that and then
19 maybe a range of views and certainly within the licensing
20 forum, those usual -- will get raised, and that's when we'll
21 debate it and adjudicate it. And so I think there is a
22 forum and a process by which those issues could be raised
23 before the review plan is put into place via the stakeholder
24 interactions and even after, during the context of its
25 implementation. I think the process allows for that.

1 MR. MCCONNELL: I'd just add that we do have a
2 program in place that looks at conservatism or optimism in
3 our models in the high-level waste code. And we do that
4 through interaction with DOE, the publication of our results
5 in NUREGs, as Norm pointed out, where everybody, all
6 stakeholders, have an opportunity to comment. And also,
7 just basically interacting with the international community,
8 which we've done this past week in the peer review of the
9 TPA code. So all of these things help us make sure that our
10 code or our models aren't overly conservative.

11 CHAIRMAN DICUS: Thank you. Commissioner
12 Merrifield?

13 COMMISSIONER MERRIFIELD: Thank you, Madam
14 Chairman. Recently, on our interaction with EPA and
15 disagreements we have with them on decommissioning standards
16 and on the health based and environment based standards at
17 Yucca Mountain, sometimes we have to look at things as being
18 half-full rather than half-empty. I was pleased to hear
19 that there are some areas of convergence with them in areas
20 where we can build on agreement, I think is important. I
21 think we should recognize that to the extent that we're
22 reaching out to them, there are issues where they're
23 reaching out to us.

24 MR. MIRAGLIA: If I might add, I think I was going
25 to ask John in the interaction of ISCORS, there's a number

1 of areas where that interface is working well and we are
2 closer together than we are further apart. And perhaps the
3 half-full versus half-empty -- John might want to add and
4 give other examples.

5 DR. GREEVES: The one I mentioned yesterday on the
6 mixed-waste front, I see that as a win-win. I don't know
7 how much visibility you get of the sewer survey, but both
8 agencies are working very well together on that. We put out
9 a lot of guidance on mixed waste, which is a troubling issue
10 for a number of the utilities. It's already out there.
11 It's agreed to by both agencies. That works well. And on
12 risk assessment, I think we're pretty close. It's the risk
13 management issues that are the ones that are troubling, and
14 I don't know whether that's the right format to make
15 progress on that topic. We have those goals.

16 We're able to make progress on those identifying
17 issues, working issues, but managing them is where the
18 difficulty -- you know, the risk management techniques are
19 the ones that we have been troubled with. And you've heard
20 about this.

21 But I think that's positive. I mean, I have, as
22 much as anyone else in the past, am on the record of having
23 disagreement with EPA, but they do have a lot of good people
24 over there, and there are areas where can't come to
25 agreement. And I think that's positive.

1 CHAIRMAN MERRIFIELD: I want to turn to slide 8.
2 I have a question that -- one of the issues discussed in
3 this is the interaction that we had with stakeholders, and
4 I'm wondering if you can describe for me a bit what the
5 nature of that interaction was, who those stakeholders were,
6 and how you, you know, what you've really gained from that
7 input.

8 Mr. EISENBERG: Okay. At one of the earlier
9 workshops, we brought up this issue of the re-suspension
10 factor, and how it seemed to be the thing that was driving
11 towards very conservative values -- unnecessarily
12 conservative values for concentration -- and asked if any of
13 the participants, any of the stakeholders had any kind of
14 data --

15 COMMISSIONER MERRIFIELD: Who were the
16 stakeholders?

17 MR. EISENBERG: -- that might help us out. And
18 two came forward -- one was Westinghouse and one was BWXT --
19 that had been gathering that kind of data in their
20 facilities and they provided it first in this open meeting
21 in the workshop and provided it to the Staff, and then the
22 Staff synthesized the data to try to determine what, what
23 the implications were for re-suspension factor. And at a
24 later meeting, the Staff presented those results. So I
25 believe that summarizes the nature of the interaction. As I

1 said before, the Staff is intending to go ahead and put all
2 this together in some kind of paper and try to get it in a
3 peer review journal, probably like --

4 COMMISSIONER MERRIFIELD: Were there other -- I'm
5 going to belabor this. Were there other non-licensee
6 stakeholders who were involved in those workshops?

7 MR. EISENBERG: Yes. Well there were the states,
8 there were other Federal agencies, and some of the Staff
9 believed they saw people from activist groups, but for
10 whatever reason, they don't show up on the rolls. They
11 might not have signed in.

12 DR. GREEVES: I know, for example, Judith Jontrude
13 has been to a number of our meetings and I would expect
14 she'd sign the rolls. She's been to a number of them. I'm
15 a little bit disappointed that we haven't had more
16 participation from that set of stakeholders and for this
17 meeting on the 18th that we're having. We've made calls.

18 I've familiar with -- Saxton has an advisory group
19 and they also have an inspector from Penn State that they've
20 hired to advise. I made arrangements for him to come in our
21 next meeting. We've invited Red Shattus to come to our next
22 meeting. We've invited Judith to come to our next meeting.
23 And another individual from the state of Pennsylvania. I
24 don't know whether they don't have the resources. But
25 they're smaller in number but they do attend the meeting.

1 And I'm looking forward to a bigger turn-out. We're trying
2 harder -- excuse me. The August 18th meeting that's coming
3 up, I've asked the Staff to make a bunch of phone calls.

4 MS. TROTTIER: Commissioner Merrifield?

5 COMMISSIONER MERRIFIELD: Yes.

6 MS. TROTTIER: May I elaborate on that a little
7 bit. In addition, part of the problem here is, when we did
8 the first version of D and D and we did literature searches
9 on available information or parameters, this is a parameter
10 where there is not a lot of really good scientific data.

11 I mean, the part we're really looking at -- it may
12 not be clear -- is indoor re-suspension. In other words,
13 from people working in a building, how much dust and dirt
14 gets stirred up in the course of the day? And a lot of the
15 studies are very old, and they're not necessarily pertinent
16 to the kinds of activities that would be appropriate for
17 this model.

18 One of the things that I have recently learned,
19 and we're going to initiate a request this next month, with
20 NIOSH. NIOSH has access to universities, and they will do a
21 study for us, to actually do a scientific study looking at
22 indoor re-suspension. So I think that, coupled with data
23 that we have obtained from industry, may help to make the
24 factor more realistic in the model.

25 COMMISSIONER MERRIFIELD: That last issue I want

1 to focus on a little bit, particularly in the high-level
2 waste portions of the presentation today, some mentions were
3 made of the Center for Nuclear Regulatory Analysis. The
4 Center, which I had an opportunity to visit this year, is
5 not part of the NRC; it's a private contractor, but is for
6 the most part funded with about \$19 million funding that
7 comes through the NRC from a high-level waste fund. And
8 they do, I think, some very important and very useful work
9 down there.

10 I'm just wondering if you could, in a very sort of
11 high-level sense, describe the interactions you had with
12 them and the types of activities that they were involved
13 with in developing the information in here, the high-level
14 waste or any of the other portions of the presentation
15 materials today.

16 MR. EISENBERG: I believe they're on video. I
17 don't know if we can bring them up, but I think they're
18 listening --

19 [Laughter.]

20 COMMISSIONER MERRIFIELD: I've got a question for
21 them.

22 MR. EISENBERG: They may be listening in. We have
23 a, I would say, very extensive -- I'm trying to think of the
24 right word -- collegial interaction with the center. Our
25 Staff works very closely with them on a lot of technical

1 issues. They are the keepers and developers of the code.
2 They're the ones that hold the archive version of it. Most
3 of that work is done at the Center, although the code itself
4 is extensively used by the NRC Staff.

5 But on almost every element of the performance
6 assessment program, the Center has made significant
7 technical contributions. For example, this effort to try to
8 clarify the results of a performance assessment -- this
9 parameter tree approach was more or less invented by the
10 Center and picked up by the Staff. So, I could go one by
11 one in each technical area, in waste package corrosion or --

12 COMMISSIONER MERRIFIELD: But you could just
13 summarize that it would be fair to characterize their
14 process as extensive and critical in the development of
15 these programs.

16 MR. MIRAGLIA: Absolutely. In terms of
17 development, I think they also play a key role,
18 Commissioner, in terms of our examination of the
19 implementation in terms of our review of DOE's and what the
20 DOE did. They play a significant role.

21 COMMISSIONER MERRIFIELD: The basis for my delving
22 into this particular inquiry, because they are not part of
23 the NRC, we sometimes forget the critical value of the work
24 that they do for us. I sort of like to refer to them as
25 sort of our NRC extended family.

1 MR. MIRAGLIA: That's a fair characterization.

2 COMMISSIONER MERRIFIELD: If they're listening on
3 the line, I have tremendous respect for their work. So I
4 did want to bring that out so that the people in the
5 audience and people listening would have a flavor for that.
6 We don't frequently talk about the Center and I think it's
7 perhaps useful to do that once in awhile.

8 CHAIRMAN DICUS: Okay. All right, I'm going to
9 follow up just real quick to, to questions on a couple of
10 items that were brought up with Commissioner Merrifield.

11 On the re-suspension factor-- you may have said
12 and I missed it -- have we, the new data that we have on
13 that, have we gotten that in the D and D code? We have?

14 MS. TROTTIER: It's not in the code yet, and I
15 feel that it needs to be peer-reviewed first before we
16 actually modify the code. But there's plenty of time to do
17 that before next summer.

18 CHAIRMAN DICUS: All right. Who would be the peer
19 review?

20 MS. TROTTIER: Well, we haven't decided. We
21 sometimes have contractors capable of doing the peer review
22 or sometimes publish it in a journal. We haven't decided
23 the exact mechanism yet.

24 MR. PAPERIELLO: I'd like to make a clarification.
25 There's a publicly available D and D code. It is not in

1 there. Obviously there's a version of D and D code where we
2 have put it in --

3 CHAIRMAN DICUS: Is that version 2?

4 MR. PAPERIELLO: That would be version 2, but
5 that's not a -- it's under development.

6 CHAIRMAN DICUS: All right, that's good
7 clarification.

8 MR. PAPERIELLO: I just wanted to --

9 CHAIRMAN DICUS: All right, fine. I understand
10 that. I understand that version 2 is under development. So
11 you are going to try to get it in, but you are going to peer
12 review it?

13 MR. PAPERIELLO: Uh hmm. Right.

14 CHAIRMAN DICUS: All right. And then the other
15 things, I'm on slide 14 on this improved total system PA
16 code, etc. I know you've been able to use it to do some
17 reprioritization of the key technical issues that have to do
18 with Yucca Mountain. I think the volcanic activity was one
19 of the ones. Is something else that reprioritized on those
20 key technical issues as a result of this improved code?

21 MR. EISENBERG: Last year, waste package, the
22 lifetime as raised -- container lifetime at source term was
23 raised as being more important. I have to hastily add, you
24 know, it's not just done based on the numerics that come out
25 of the PA codes. But it's truly risk-informed and there's a

1 lot of other factors that have to be considered. But that
2 was one thing that came up.

3 And another example would be the importance of the
4 saturated zone, which with the new rule, takes on much
5 larger significance. So that was another one that has
6 increased in importance.

7 CHAIRMAN DICUS: Okay, thank you. And the
8 technical exchange that occurred with DOE on the PA for the
9 viability assessment, was that a public meeting?

10 MR. EISENBERG: Absolutely.

11 CHAIRMAN DICUS: That's all I have. Commissioner
12 Diaz?

13 COMMISSIONER DIAZ: Okay. Well there be a nexus
14 between the issues resolution and status report for
15 performance assessment methodology and any industry
16 standards? Is there gonna be such a thing as an industry
17 standard or peer review standard or something that we can
18 compare with?

19 MR. MCCONNELL: Certainly for the operational or
20 pre-closure stages, we would implement basically the
21 industry standards, which are already implemented in our
22 existing guidance for other facilities, similar facilities.
23 So in that respect, yes. For the post-closure, part of the
24 review plan, particularly since we're embarking on a
25 risk-informed performance-based review plan, that we're kind

1 of creating new ground as we go. So I don't think there is
2 industry standard for that part of it.

3 COMMISSIONER DIAZ: Is there any movement in that
4 direction?

5 MR. EISENBERG: I don't think so because the only
6 likely licensee in this country is DOE, so the rest of the
7 industry may not have much incentive.

8 COMMISSIONER DIAZ: Okay, so nobody has gone crazy
9 out there and said we're going to develop a different set of
10 standards?

11 MR. EISENBERG: As John -- John reminds me that
12 EPRI has all along been following the high-level waste issue
13 and doing their own performance assessment. So that, I
14 think, helps put the, keeps the rest of us calibrated.

15 DR. GREEVES: And they actively participate in
16 these meetings, which has been very useful.

17 COMMISSIONER DIAZ: So that is your calibrator
18 then?

19 FEDERLINE: One thing, the high-level waste areas,
20 our peers are the international communities and other
21 countries that are also developing high-level waste sites.
22 And we actively participate with the NEA and the IAEA to
23 develop standards in the area. And there's industry input
24 to those, so it's more the size of the community, and how
25 many sites are being licensed in each country dictates the

1 development of the standards.

2 CHAIRMAN DICUS: That's one of the values of our
3 international program.

4 MS. FEDERLINE: Thank you.

5 COMMISSIONER MCGAFFIGAN: Let me just try to
6 understand all of the different codes that are under
7 development. There's a view graph, but we have a D and D
8 version 2; we have a probabilistic D and D, which is
9 different from D and D version 2?

10 MS. TROTTIER: That is version 2.

11 COMMISSIONER MCGAFFIGAN: And then we have RESRAD
12 version -- whatever, 80-something, 5-point -- that's going
13 to be a probabilistic RESRAD?

14 MS. TROTTIER: It's a probabilistic RESRAD --

15 COMMISSIONER MCGAFFIGAN: That DOE is developing
16 or we're developing?

17 MS. TROTTIER: That actually Argonne is
18 developing. We've asked Argonne to do this for NRC. And
19 the specific reason was, DOE may have other desires for
20 their code, so this is a version that Argonne is developing
21 for NRC. Certainly I'm sure other people would be allowed
22 to use it; it's a publicly available code. But the idea was
23 that we weren't going to ask DOE to change their code but
24 rather have Argonne produce a code that would be useful for
25 us, and DOE supported the effort, in terms of saying it was

1 an okay thing to do

2 COMMISSIONER MCGAFFIGAN: So there's basically two
3 near-term code, probabilistic D and D, probabilistic RESRAD,
4 that you're trying to get out by sometime next year?

5 MS. TROTTIER: They will be done before August
6 2000.

7 COMMISSIONER MCGAFFIGAN: EPRY was -- just
8 mentioned in some viewgraphs that EPRI had on the various
9 codes a month ago. One of the weaknesses they talked about
10 D and D, the current D and D, is a QA/QC issue. Could you
11 explain what the QA/QC issue with D and D is?

12 MS. TROTTIER: I think what they're really
13 referring to is the difference that RESRAD has been out for
14 many years, is very well documented, has been benchmarked,
15 and D and D is still in that process. The basic code,
16 QA/QC, has been done on the mechanics of the code. But as
17 far as the comparing it with other results, that process is
18 still going on. I think that's what they really mean. And
19 so, you know, over time when we have a few more years of
20 use, I think we'll have that benchmarking of D and D
21 complete.

22 COMMISSIONER MCGAFFIGAN: The weaknesses of
23 probabilistic D and D that they suggested, and some of them
24 hopefully will be fixed by next August -- not in a usable
25 form. I'll presume it'll be in an unusable form.

1 MS. TROTTIER: The version we gave them is the
2 Staff version, which is very crude. It's very hard to
3 operate.

4 COMMISSIONER MCGAFFIGAN: Difficult to change
5 PDFs, the input parameters? I'm not sure that presumably is
6 getting to be -- uncertainty analysis is limited by the
7 model's capability. Are any of those -- some of those are
8 going to get fix, is the last point I'm going to get to
9 here.

10 MS. TROTTIER: Well, as I said before, the model
11 is the issue that we can fix in the short term. I believe
12 the issue of the changing the parameters is going to be
13 fixed. One of the things I did not mention, that the
14 current version of D and D, you can turn off pathways, but
15 you really have to know what you're doing to do it. We're
16 going to make the code more user-friendly from that
17 perspective. So, when the user first picks it up, they'll
18 be able to easily turn off a pathway and run the modeling in
19 the version that's most appropriate for their site.

20 COMMISSIONER MCGAFFIGAN: I'm only going through
21 the weaknesses. On probabilistic RESRAD, they describe
22 built-in, user-friendly features, etc., as positive
23 characteristics. But a weakness, they say the code is
24 unstable to use. Is that also going to be fixed by next
25 August.

1 MS. TROTTIER: As far as I know, it will.

2 COMMISSIONER MCGAFFIGAN: Okay. One of the things
3 that you didn't mention that was mentioned in the paper --
4 again a correction to D and D, this is 99-035, were plant
5 mass loading factors. Is that also --

6 MS. TROTTIER: Those are going to be incorporated
7 into version 2

8 COMMISSIONER MCGAFFIGAN: And that was a factor of
9 about 8 or 10 as well?

10 MS. TROTTIER: Yes.

11 COMMISSIONER MCGAFFIGAN: Okay. As I say, it
12 strikes me that we were very conservative in the original D
13 and D, and maybe version 2 will be more realistic. And what
14 you outlines in terms of the long-term program was maybe to
15 allow more realism in versions 3, 4, and 5 than we are
16 capturing thus far. Is that the goal?

17 MS. TROTTIER: It's hard to tell right now how far
18 we'll go with D and D because the concept was always that it
19 would be a screening model, but the real purpose --

20 COMMISSIONER MCGAFFIGAN: -- RESRED probabilistic.

21 MS. TROTTIER: The real purpose, I think, in going
22 back and looking at the model that's in D and D is to make
23 sure that the amount of conservatism in it is appropriate
24 and that, in fact, it does accurately reflect reality.

25 CHAIRMAN DICUS: Okay, Carl? Did you want to --

1 MR. PAPERIELLA: Yeah, I just want to make a
2 comment about models in general.

3 It's very dangerous to use a model as a black box.
4 And it's very tempting to use a model as a black box. Since
5 we know there are some licensees that are going to do it,
6 we've got to protect everybody, and that's how you deal with
7 your conservatisms.

8 When I look at a real site and try to look around
9 at a model that can accurately represent a real site, it's
10 frightening; there isn't any that I can find. I've just
11 been at Maine Yankee. But the bulk of our licensees, again,
12 it's not nuclear power plants. The bulk of our licensees
13 really needs a very simple tool to demonstrate to anybody
14 who asks them, to the people who live around the facility or
15 us, that that they're okay.

16 And so, D and D fulfills a very, even
17 conservatively, fulfills a very, very vital function for
18 probably 99 percent of our licensees and we don't want to
19 lose that, while we're still trying to find -- I would
20 welcome the private sector creating a model that can
21 represent some of the site I could identify like, you know,
22 a facility like Maine Yankee, where you have spots of
23 contamination. You don't have big, uniform fields or things
24 like that. I don't have a model that does that right now,
25 easy.

1 COMMISSIONER MCGAFFIGAN: I have one last
2 question, if I could. And it may be more for Joe Gray than
3 the Staff. Has any decommissioning proceeding, has anything
4 gone to a hearing, and has a licensing board panel had to
5 struggle yet with whether the Staff model is the correct
6 model or whether parameter X or Y or Z is not conservative
7 enough, has that happened yet?

8 MR. GRAY: I don't believe up to this point, to
9 the extent of actually being in a hearing and litigating the
10 models has occurred here.

11 COMMISSIONER MCGAFFIGAN: Would it be -- just
12 under our rules at the moment, would it be a contention, if
13 you had standing that the model that they're using to say
14 this site is cleaned up to 3 millirems. I question that it
15 really isn't clean to 35 because assumptions A, B, C, and D
16 and parameter values X, Y, and Z are false, that that would
17 be a contention I could get adjudicated?

18 MR. GRAY: Any assertion by an applicant for, for
19 license termination, that it meets the standards for license
20 termination can be challenged. And the licensee will need
21 to demonstrate that it's meeting the standards. And part of
22 the demonstration is showing its calculations and its models
23 that it's using give reasonably accurate results. And so --

24 COMMISSIONER MCGAFFIGAN: I don't want to
25 blindside --

1 MR. MIRAGLIA: For a contention, if someone wants
2 to contend that they don't agree with the model, they have
3 to have some sort of basis, some credibility. You can't
4 just make the assertion. We're not having some facts. And
5 then the board will determine whether that's an issue in
6 controversy that would need to be --

7 COMMISSIONER MCGAFFIGAN: What would be the legal
8 standard that the licensee would have to demonstrate in
9 making that, making that challenge?

10 MR. GRAY: I mean, that really is the -- that's
11 difficult to say. I mean, that's really fact-specific,
12 evidentiary -- they basically would have to show by
13 preponderance of the evidence that, that their calculations
14 and their projections are reasonable to predict what
15 actually would be left on the site, to predict the way that
16 they would meet the standards in the regulations.

17 COMMISSIONER MCGAFFIGAN: Would they have to meet
18 arbitrary and capricious, or is it a lower standard?

19 MR. GRAY: No, arbitrary and capricious is what we
20 would have to meet in finding eventually -- in ruling on, on
21 the particular contention that was subsequently appealed.
22 Arbitrary and capricious is what we would have to meet to
23 uphold our finding.

24 COMMISSIONER MCGAFFIGAN: I just want to tell the
25 folks, the reason I pursued the line of questioning is a

1 recent licensing board panel judgment about testing things
2 in the crucible in the adjudicatory process and it, you
3 know, wasn't giving a lot of weight to a Staff guidance
4 document because it was the Staff agreeing with itself. And
5 so these are going to be particularly complex guidance
6 documents to adjudicate if they indeed are adjudicable.
7 I'll just give everybody fair warning that we expend a fair
8 amount of resources on.

9 MR. MIRAGLIA: But that's been the case, I would
10 say -- you asked for the specifics in terms of a
11 decommissioning, but certainly within the context of reactor
12 proceedings, reg. guides and the demonstrations that ECCS
13 criteria and other criteria have met, those kinds of issues
14 have been --

15 COMMISSIONER MCGAFFIGAN: That absolutely has been
16 the case. NRC has --

17 MR. MIRAGLIA: So in that sense, they have been
18 tested in that crucible and with the passage of time, these
19 perhaps could be tested, would be -- couldn't perhaps would.

20 CHAIRMAN DICUS: Commissioner Merrifield, do you
21 have any --

22 COMMISSIONER MERRIFIELD: Well, I didn't
23 originally have a question. Carl, when you were describing
24 your concern about modeling, I think you made a pretty fair
25 characterization that a model is not an end-all and be-all.

1 You've got to be concerned about site-specific factors and
2 factoring that in. I forget what the word you used -- scary
3 or something like that. And then you sort of made a
4 relatively quick transition to being up at Maine Yankee.
5 And I was wondering if you wanted to clarify at all, for the
6 record, just not to leave any doubt out there about your
7 visit to Maine Yankee and your reactions to that.

8 MR. PAPERIELLO: Yeah. D and D applied to Maine
9 Yankee would be incredibly conservative because it assumes,
10 fundamentally, an infinite plane, infinite volume of
11 contamination. The contamination there is a couple
12 incredibly small -- I mean, outside of where the actually
13 containment building set, the actual land is incredibly
14 small. And if you think about even direct exposure, if I
15 stand in the middle of a field, actually once I get beyond
16 about a thousand-meter radius, the contamination in the
17 ground contributes nothing to my dose. And once I get much
18 deeper, at about six or eight inches, the contamination
19 contributes nothing.

20 CHAIRMAN MERRIFIELD: Let me focus this a little
21 bit. You're visit to Maine Yankee -- correct me if I'm
22 making the wrong characterization. Your visit to Maine
23 Yankee left you with the feeling that it was overly
24 conservative as it relates to Maine Yankee, but you didn't
25 have any discomfort for the levels of contamination at Maine

1 Yankee.

2 MR. PAPERIELLO: No. It reinforced my direction
3 to the Staff. And one of the things that might be holding
4 up the standard review plan is my direction, is we gotta
5 tell licensees, in relief in a sense, what do you do when
6 you don't have an infinite plane? You can't have an
7 agricultural pathway unless you have enough acreage. So if
8 you have one spot that's contaminated that's 20 feet in
9 diameter, I can't have an agricultural pathway. I can't
10 have a fish pond pathway. And how do I run my models and
11 turn those pathways off, and then, and in RESRAD you do have
12 a correction for finite area. But in our guidance documents
13 as written today, we do not tell and provide guidance to the
14 licensees for turning off pathways that physically can't
15 exist because of the finite volume and area of land that is
16 contaminated. And at Maine Yankee, you are talking about
17 very small pieces, and the models are very conservative.

18 COMMISSIONER MERRIFIELD: So, because the level of
19 contamination at Maine Yankee is so low --

20 MR. PAPERIELLO: That's right.

21 COMMISSIONER MERRIFIELD: -- and is such a low
22 significance in some manners, the application of this model
23 and its conservative manner would have sort of a ridiculous
24 result if it were applied to Maine Yankee. Okay. Thank
25 you.

1 CHAIRMAN DICUS: Okay, well, on behalf of my
2 fellow commissioners, I again want to thank the Staff for
3 this briefing and really for the discussions and exchange
4 that occurs between us. I think today's briefing, together
5 with yesterday's briefing, has been very helpful for all of
6 us. We have questions, but I think we have pathways for
7 resolution, and I really appreciate the time and effort
8 you've put into this. We'll continue to work on these
9 issues and particularly get involved in the policy issues
10 and the underlying issues and the going forward problems
11 that we need to deal with.

12 We encourage you, continue to encourage you to
13 share the knowledge gained in the program with the technical
14 Staff at NRC, but also with all of our stakeholders, whoever
15 they may be, and with our other members of our Federal
16 families. And I assume my colleagues have nothing else they
17 would like to say. Given that, we are adjourned.

18 [Whereupon at 11:03 a.m., the briefing was
19 concluded.]
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25

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 PERFORMANCE ASSESSMENT
PROGRESS IN LLW, HLW, AND SDMP
PUBLIC MEETING

PLACE OF MEETING: Rockville, Maryland

DATE OF MEETING: Friday, July 30, 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: Lucy McKinney

Reporter: Mike Paulus



STAFF BRIEFING ON THE STATUS OF THE PERFORMANCE ASSESSMENT PROGRAM

**Norman A. Eisenberg
Office of Nuclear Material Safety and Safeguards
Division of Waste Management
U.S. Nuclear Regulatory Commission**

JULY 30, 1999

**(301) 415-7285
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OUTLINE OF BRIEFING

1. What is Performance Assessment (PA)?

2. Recent Activities in PA

- Site Decommissioning Program**
- RES Role in PA**
- High-Level Waste (HLW) Program**
- Low-Level Waste (LLW) Program**

3. Summary and Look Ahead

LIST OF ACRONYMS

PA	Performance Assessment
HLW	High-Level Waste
LLW	Low-Level Waste
SRP	Standard Review Plan
SEDSS	Sandia Environmental Decision Support System
DandD	<u>Decontamination and Decommissioning</u> Computer Code
RESRAD	RESRAD (<u>Residual Radioactivity</u>) Computer Code
ALARA	As Low As Reasonably Achievable
RF	Resuspension Factor (1/M)
TSPA	Total System Performance Assessment
VA	Viability Assessment
LA	License Application

WHAT IS PERFORMANCE ASSESSMENT?

- **A type of systematic analysis:**
 1. **What can happen?**
 2. **How likely?**
 3. **What are impacts?**
- **Integrates information**
- **Provides quantitative estimates of performance**
- **Performance Assessment is matched to need**

DECOMMISSIONING PA: PROGRESS & PLANS

- **Standard Review Plan (SRP) to implement License Termination Rule**
 - **Dose modeling is key**
 - **NMSS and RES staff developing guidance**
 - **Draft guidance provided to stakeholders**
 - **Screening concentrations for building contamination**
 - **Additional tables planned with less conservatism**
 - **Review guidance on buried sources provided to regions**
 - **Some SRP modules provided to stakeholders**
 - **Coordinate ongoing casework with guidance development**
 - **Final SRP planned to be issued July 2000**

DECOMMISSIONING PA: PROGRESS & PLANS (CONT.)

- **Framework and methodology for structured decision-making**
 - **Decision framework (Draft NUREG 1549) undergoing test**
 - **Implementing framework in computerized platform (SEDSS)**
- **Specific casework proceeding with reviews or on-hold pending submittals by licensees**
- **Decommissioning Management Board providing oversight and coordination with NMSS, RES, NRR, Regions**
- **Ongoing enhancements of dose modeling codes (DandD and RESRAD)**

IMPROVING TECHNICAL APPROACHES IN PA WITH STAKEHOLDER INTERACTION

Public Workshops on Decommissioning	
Workshop Date	Topic
DEC 1-2, 1998	General Dose Modeling
JAN 21-22, 1999	Dose Modeling and Restricted Release
MAR 18-19, 1999	Dose Modeling and ALARA
JUN 23-24, 1999	Ground-Water Modeling Related to Dose Assessments
AUG 18-19, 1999	State Issues; License Termination Plans; etc.
OCT 20-21, 1999	TBD

LICENSE TERMINATION DOSE MODELING

Resuspension Factor for Building Occupancy

- **ISSUE:** Resuspension factor (RF) is the sole random variable used in the dose model influencing inhalation dose
- **INTERACTION:** Staff requested stakeholders provide data
- **RESULT:** Stakeholders provided data
 - Supported downward revision of RF
 - Produced more realistic dose estimates

ORIGINAL AND REVISED CONCENTRATION VALUES EQUIVALENT TO 25 mrem

Radionuclide	Concentration (dpm/100 cm ²)	
	Based on original RF	Based on revised RF
U-238	100	1800
Th-232	7	140

LICENSE TERMINATION DOSE MODELING

Screening Values for Soil Contamination

- **ISSUE:** Algorithm to set default parameter values, using all radionuclides, produced unnecessarily conservative estimates for some radionuclides
- **INTERACTION:** Stakeholders indicated problematic results for Cs-137, Sr-90, etc.
- **RESULT:** Staff will generate a table of screening concentrations
 - Value for each radionuclide
 - Reduces unnecessary conservatism

SCREENING CONCENTRATION VALUES

FROM ORIGINAL AND MODIFIED CODE

	Screening Concentration (pCi/g) Equivalent to 25 mrem	
Radionuclide	DandD Version 1	DandD Version 2 (anticipated)
Fe-55	9500	10,000
Co-60	3.6	3.8
Sr-90	0.42	1.7
Cs-137	0.9	11
Th-232	1.0	1.1
U-238	0.5	14

RESEARCH ROLE IN PA

- **DEVELOP PERFORMANCE ASSESSMENT TOOL BOX SUITABLE FOR A RANGE OF SITES**
 - **Range from simple (DandD, RESRAD) to complex (SEDSS)**
 - **Deterministic to probabilistic**
 - **Near term goals**
 - **NRC developing probabilistic version of RESRAD**
 - **Revise DandD to remove unnecessary conservatisms**
 - **Enhancement of SEDSS to allow use of 2- and 3-dimensional codes and multi-dimensional data sets**

RESEARCH ROLE IN PA (CONT.)

- **LONGER-TERM GOALS**

- **Improve realism in model assumptions and default parameter values to ensure appropriate level of conservatism**
- **Improve ability to evaluate uncertainty related to alternative groundwater conceptual models**
- **Enhance sorption modeling to improve prediction of transport**

- **RECENT ACCOMPLISHMENTS**

- **NAS Workshop reviewed technical approaches to discriminate among alternative conceptual models of flow and transport**
- **Parameter distributions for decommissioning site reviews based on soil textural classes**

HLW PA: PROGRESS & PLANS

- **Completed and Used Improved Total System PA (TPA) Code**
 - **Currently Version 3.2**
 - **To evaluate new Department of Energy designs**
 - **Continuing evaluation to reduce unnecessary conservatism**
 - **External peer review initiated**
 - **Total system and subsystem sensitivity analyses**
 - **Helps focus program on most significant issues**
 - **Integrates PA with other HLW staff activities**
 - **Basis for NRC interactions with and comments to DOE on TSPA-Viability Assessment (TSPA-VA)**
 - **Planning to improve code for License Application (LA) review**

HLW PA: PROGRESS & PLANS (CONT.)

- **Rule for HLW Disposal at Yucca Mountain**
 - **Proposed 10 CFR 63 issued by Commission February 22, 1999**
 - **Staff using PA insights, results, and techniques to help with:**
 - **Communication at extensive stakeholder interactions**
 - **Finalization of rule, including response to comments**
 - **Evaluating Environmental Protection Agency's HLW Standard; implementability and consistency with NRC rule**

IMPROVING TECHNICAL APPROACHES IN PA WITH STAKEHOLDER INTERACTION

Input on Proposed Part 63

- **Defense-in-depth**
- **Protection of infants and children**
- **Groundwater protection**
- **Definition of critical group**
- **Reference biosphere**
- **Institutional control**
- **Human intrusion**

HLW PA: PROGRESS & PLANS (CONT.)

- **Interacted with DOE on PA for VA:**
 - **Technical Exchange: May 25-27, 1999**
 - **Appendix 7 Meeting on Disruptive Events, October 5-6, 1998**
 - **Several positive aspects of DOE's TSPA-VA**
 - **Some questions remain; e.g.,:**
 - **Waste package corrosion**
 - **Quantity and chemistry of water contacting waste packages and waste forms**
 - **Saturated zone flow and transport**
 - **Volcanic disruption of the waste package**
 - **PA facilitated, focused, timely review of VA**

HLW PA: PROGRESS & PLANS (CONT.)

- **Issued Revision 1 of Issue Resolution Status Report for Performance Assessment Methodology**
 - Improved discussion of scenario analysis
 - Compliance demonstration
- **Developing improved methods for clarifying PA results (encouraged by ACNW); e.g., Parameter tree**
- **Developing Yucca Mountain Review Plan**
 - Tied to risk-informed Part 63
 - PA focused post-closure review
 - ISA focused pre-closure review
- **Multiple publications**

LLW PA: PROGRESS & PLANS

- **Review, under IMPEP (Integrated Materials Performance Evaluation Program), of state regulatory programs**
- **By end of FY00, revise Draft Branch Technical Position (BTP) on LLW PA**
 - **Based on Agreement State and public comment**
 - **Use contractor to supplement limited staff resources for PA**

SUMMARY AND LOOK FORWARD

DECOMMISSIONING:

- **Develop SRP as guidance for implementation of license termination rule in FY2000; some interim guidance issued sooner**
- **Coordinate ongoing casework with guidance development to maximize consistency**

HLW:

- **PA provides essential input to regulatory decisions and products, e.g., Yucca Mountain Review Plan**
- **Strive for cost-effective, timely, issue-oriented improvement in capability**

SUMMARY AND LOOK FORWARD (CONTINUED)

HLW (CONT.):

- **Near-term focus:**
 - **Technical insights for finalizing site-specific HLW rule**
 - **Timely feedback to DOE on developing PA for Site Recommendation and LA**
 - **TSPA-LA anticipated for 2001; Draft Safety Evaluation Report to Commission 18 months after receipt of formal LA**

LLW:

- **In FY00, revise Draft BTP on LLW PA based on Agreement State and public comments received**