

Official Transcript of Proceedings
NUCLEAR REGULATORY
COMMISSION

Title: Advisory Committee on Nuclear Waste
 170th Meeting

Docket Number: (not applicable)

Location: Rockville, Maryland

Date: Thursday, May 25, 2006

Work Order No.: NRC-1056

Pages 1-176

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON NUCLEAR WASTE

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170TH MEETING

+ + + + +

THURSDAY,

MAY 25, 2006

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The Committee met in Room T2 B3 of the U.S. Nuclear Regulatory Commission, One White Flint North, 11555 Rockville Pike, Rockville, Maryland, at 8:30 a.m., Michael T. Ryan, Chairman, presiding.

PRESENT:

- MICHAEL T. RYAN ACNW Chairman
- ALLEN G. CROFF ACNW Vice Chairman
- RUTH F. WEINER ACNW Member
- JAMES H. CLARKE ACNW Member
- WILLIAM J. HINZE ACNW Member

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

8:34 a.m.

CHAIRMAN RYAN: Okay. If I could ask folks to, please, move to their seats and come to order. This is the third day of the 170th meeting of the Advisory Committee on Nuclear Waste. My name is Michael Ryan, Chairman of the ACNW. The other Members of the Committee present are Allen Croff, Vice Chair, Ruth Weiner, James Clarke and William Hinze.

During today's meeting, the Committee will be briefed by the National Academy of Science Staff on the findings of the Congressionally-mandated study of radioactive waste streams stored in tanks at three DOE sites. We'll be updated by the NRC staff on the progress and the development of standard review plans to be used by the NRC staff to review DOE waste determinations and we will be briefed by the NRC staff regarding the International Commission on Radiological Protection Draft Report, titled "The Scope of Radiological Protection Regulations." The Committee will also discuss proposed letters and reports.

Latif Hamdan is the designated federal official for today's initial session and this meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. We have

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1 received no written comments or requests for time to
2 make oral statements from members of the public
3 regarding today's sessions. However, should anyone
4 wish to address the Committee, please, make your
5 wishes known to one of the Committee staff.

6 It is requested that speakers use one of
7 the microphones, identify themselves and speak with
8 sufficient clarity and volume so they can be readily
9 heard. It is also requested that if you have cell
10 phones or pagers, you kindly turn them off. Thank you
11 very much.

12 I would like to open by first recognizing
13 Commissioner Lyons is with us this morning for a time
14 and we appreciate your attendance Commissioner and
15 thank you very much for being here.

16 Without further ado, I'll turn over this
17 session to Vice Chair Allen Croff who will be leading
18 us on the next few topics through lunch. Allen?

19 VICE CHAIRMAN CROFF: Thank you, Dr. Ryan.
20 Our first order of business is we're going to hear a
21 report on a recently completed National Academy of
22 Sciences study, familiarly known as the Study on
23 Certain Tank Wastes. The longer title is on the
24 screen and I won't read it. I would like to introduce
25 our speakers.

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1 First is Dr. Frank Parker, who chaired the
2 Committee. He is a distinguished professor of civil
3 and environmental engineering at Vanderbilt. His
4 research interests include hazardous and chemical
5 radioactive waste disposal policy, risk analysis of
6 hazardous and radioactive waste disposal, thermal
7 pollution and water resource engineering.

8 Next, Milt Levenson, over here on my left,
9 is a chemical engineer with more than 50 years of
10 experience in nuclear energy and related fields,
11 including work related to nuclear safety, fuel cycle,
12 water reactors, advanced reactors and remote control.
13 He has worked in a number of places, including Oak
14 Ridge National Laboratory, Argonne, EPRI, Bechtel and
15 he is a former member of this Committee.

16 Next, Dr. Anne Smith, over on my far left,
17 is an expert in integrated assessment of environmental
18 and energy problems, specializing in risk management,
19 decision analysis, benefit cost analysis and economic
20 modeling. She has applied these techniques to issues
21 such as contaminated site management, nuclear waste
22 management, global climate change, air quality and
23 food safety.

24 And also with us on my far right are two
25 members of the National Academy of Sciences staff that

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1 worked on the report, Kevin Crowley, closest to me,
2 who is, I guess, the staff director, is that the
3 proper title, for the Nuclear and Radiation Studies
4 Board. I got it right. And next to him is Micah
5 Lowenthal, who was the lead staff member on this
6 particular study.

7 With that, Frank, go ahead and take it
8 away.

9 DR. PARKER: Well, it's a very distinct
10 pleasure for me to be here, though I'm used to sitting
11 on the other side of the table more than I am standing
12 up here in front of the Committee. I'm going to try
13 to stay closely to what the report had to say, but
14 since this is being taped and will be reproduced, I'm
15 going to throw in some personal asides and I'll try to
16 identify those as we go along.

17 If not, I'm sure the Committee Members or
18 the staff will be happy to straighten me out and
19 particularly the chair of this session, who is also a
20 Committee Member by the way, he forgot to mention that
21 he has a conflict of interest, because he was also a
22 very prominent member of our committee.

23 The three sites, of course, are Hanford,
24 Savannah River and Idaho and the report, as you know,
25 was produced as a result of a Congressional-mandate,

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1 which required us to have an interim report six months
2 out on Savannah River site and then six months later
3 on the three sites.

4 As you know, this is a very accelerated
5 schedule and we've had some discussions with staff and
6 ourselves about how to avoid being in those
7 circumstances, as people in this room can well
8 understand, that doesn't necessarily lead to the best
9 results.

10 We have also been forced then to reduce
11 the scope of the study that the Congress asked us to
12 do, because we could not cover it in sufficient detail
13 to satisfy ourselves with the requirements of the
14 Academy.

15 Okay. This is an outline of what I'm
16 going to say, of course, in the time available to me,
17 I'm going to try to talk for less than a half hour,
18 though faculty members, as you know, 50 minutes is the
19 standard time period, but we'll have some of the other
20 committee members also join in, I'm sure, to say a few
21 words about whether they agree or disagree with the
22 things that I had to say.

23 Under the background, I want to point out,
24 and you'll see that in the slides in a moment, the
25 differences in the tanks at each site and between

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1 sites. As some of you know, I was a consultant to the
2 predecessor of this Committee for many years and we
3 looked at these sites and we looked at these tanks and
4 because we looked at only specific features of it, I
5 think I and some of the members of the staff, who had
6 also been to these sites a number of times, were
7 really surprised when you look in detail at what these
8 tanks contain and how they differ from site to site.

9 And so if we look at it, and you'll see in
10 a moment, the tanks differ among themselves at each
11 site, and you'll see that in the overheads. The
12 construction of them differs, the contents of them
13 differ and their natural surroundings differ, as well
14 as the social and political climate in which they
15 individually operate. So there's no cookie cutter
16 that will produce a result that will satisfy all of
17 these tanks.

18 CHAIRMAN RYAN: Frank, just a quick
19 interruption, I apologize. We have a phone bridge to
20 Savannah River site, Kent Rosenberger, from the SRS
21 staff is on the line. I just wanted everybody to
22 realize we had a phone bridge. Thanks.

23 DR. PARKER: I want to say something about
24 the committee. It was a very large committee. We had
25 21 members in the committee. We had six staff members

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1 with -- including ex-officio Kevin Crowley, who played
2 an important role as well, so it was very well
3 staffed, but also having a committee of 21 people is
4 a problem, as you mostly likely gather.

5 I want to do this in a chronological
6 order, the order in which the tanks were built. And
7 here we see, of course, very familiar the single and
8 double-shell tanks at the Hanford site. And you can
9 also see on it a quite large number of rises or entry
10 points, but as you can notice, even though this is not
11 the scale, these are very, very small, so it's very
12 difficult to get the instrumentation in there. It's
13 very difficult to get the machinery or the tools that
14 will be able to take the waste out of the tank.

15 And here is a very idealized view of what
16 we're going to look at, the supernate and the salt
17 cake and then the sludge. I should say that all of
18 these tanks, as almost all of you know, are beyond
19 their design lifetime. And in the single-shell tank,
20 a good fraction are known leakers and I think we could
21 almost say that the rest of them mostly likely have
22 leakers as well, they just haven't been tested enough
23 to find out, because it wouldn't make very much
24 difference as to what's going on.

25 One of the reasons why the Hanford tank,

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1 and I'll come back to the tanks, is so different, they
2 had a much more checkered history than the other sites
3 and we'll look at that in just a moment. And here are
4 the Savannah River sites, you know, it's not
5 surprising that the Hanford tanks differed so much,
6 but this is almost like the reactors in this country,
7 everyone wanted their own design. And so here, we see
8 four designs and only one of them, as you can see
9 here, is actually a double-shell tank. So it's the
10 only one that would be compliant and that would meet
11 the EPA requirements.

12 I should also point out, which I think
13 everybody in this room knows, that the processing is
14 an aqueous acidic product and then it has to be
15 neutralized before it is put into these tanks for
16 Savannah River and Hanford. Whereas, when we go to
17 the next one, which is the Idaho, there they have
18 stayed in the acidic form and just calcined.

19 Again, you see the differences in the
20 design, even though these simple bins -- I should also
21 point out that some of the Savannah River tanks
22 actually sit in the groundwater or tend to be reached
23 by the groundwater. Whereas, of course, the Hanford
24 and the Idaho tanks are a very great distance above
25 the water table. I think most people don't realize

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1 and I don't think we realize ourselves until we
2 actually saw a markup of it.

3 This is the inside of the Savannah River
4 tank and these are the coolant coils. This is before
5 start-up and so the net result is after the wastes
6 were in there and after the sludges started
7 accumulating and some of the material hardened, now,
8 you're going to have to try to clean out. And these,
9 of course, are almost nuclide for the precipitation of
10 the material onto these pipes. Now, you're going to
11 have to get in there and get the waste out of this
12 maze and that's a big challenge in itself.

13 That's too far. And this is the tank
14 waste sludge from Savannah River site and, as you can
15 see, it doesn't flow very easily and some of it is
16 very, very hard to get out. And put down some of the
17 very specific conditions and how the sites differ from
18 each other, since you have it all -- oops, I skipped
19 one some how or the other, I want to go back a moment
20 then. I want to go back two, actually, three. There
21 we are.

22 Not only do the single-shell tanks leak,
23 the double-shell tanks leak and here is what we see on
24 the outside of the double-shell tank, but within the
25 containing pad and it's going to be a difficult

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1 problem to get this waste out of there as well. This
2 is an idealized view. The reason I wanted to put this
3 in here is because notice that the majority of the
4 radioactive material is in the salt supernate, which
5 is the easiest part to get out and in the sludge. And
6 the salt cake actually has very small amounts of the
7 waste.

8 And the other thing that I don't think is
9 widely appreciated is the amount of junk that is
10 tossed into those tanks. These are steel measuring
11 tapes which after they took the measurements, they
12 just dropped them in the tank and that's not the only
13 thing that they drop into the tanks and the next one
14 we will see some of that. As you can see, we talked
15 about the different things that were put into the
16 tanks and so we're going to have to cover the waste,
17 trying to get around some of the things that were put
18 in there, as we can see, soil, debris, failed
19 equipment put into the tanks. And so it's not a
20 simple task even without that, with that in there it
21 makes it, of course, even more difficult.

22 Okay. If we look at the natural features,
23 I think it's quite important to notice how different
24 they are. In this, the Idaho and the Hanford sites
25 are very, very -- are much more similar to each other

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1 than they are to the -- sorry. The Hanford and
2 Savannah -- I said it right the first time.

3 The Hanford and Idaho are very similar to
4 each other in the physical and the natural conditions.
5 Whereas, on the radioactive conditions, the Savannah
6 River and the Hanford site are very similar. But if
7 you look at the important items, look at the distances
8 to the nearest surface water, the nearest ground
9 water, the depth that flows into those things, the
10 depths of the groundwater table, the annual
11 precipitation and the amount of infiltration, you can
12 see how different they are and the different problems
13 that they all present.

14 And, of course, the main objective in
15 showing this is we want to figure out how to prevent
16 this infiltration to getting into the tanks and
17 through the covers. And I think it's -- I don't know
18 where it is in this slide list. I guess, there's an
19 addendum to the cover, it would be on there and it
20 will eventually show. None of these have been
21 installed, so we really don't want to say very much
22 about it now and didn't say very much about it.

23 Well, I mentioned that this was a result
24 of a Congressional-mandate in the 2005 National
25 Defense Authorization Act, and they asked the

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1 committee to look at the radiological characteristics
2 of the waste and see whether there was enough
3 information available to proceed and they asked us to
4 look more about the compliance with the performance
5 objectives and the adequacy of the plans for
6 monitoring and whether the technology was suitable and
7 the technology gaps, etcetera.

8 I'm not going to read it, because you have
9 it in front of you, but I think the last part perhaps,
10 from my point of view, was good, because it said we
11 could make recommendations that we consider
12 appropriate including, so this gave us a lot of leeway
13 and we took advantage of it to the extent that we have
14 the time to do that.

15 Well, one of the things that we didn't
16 highlight in the report, but I want to say a few words
17 about at the moment, and that's to try to put this
18 into some time perspective and this is my own -- these
19 are my own views. The first international meeting on
20 radioactive waste disposal took place in 1959 in Monte
21 Carlo. There were papers presented by Hanford,
22 Brookhaven and Oak Ridge that dealt with the
23 experiments on vitrification of tank waste. That was
24 in '59 and that means that a lot of people in this
25 room weren't even born and people were already talking

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1 about vitrifying the tank wastes.

2 The second item I want to put in
3 perspective, by the mid-1960s, experiments had been
4 carried out with spent fuel in salt mines where they
5 reached the temperature and the dosages to the salt
6 that showed that it was possible for salt to contain
7 the waste, even though these were short period tests.
8 So that's over 30 years ago, more than 30 years ago
9 that proof had been shown, at least to a limited
10 extent.

11 And in 1972, Burger or DOE or AEC,
12 whatever it was called at that time, they announced in
13 1972 that within three years they would have an
14 operating repository at a total cost of \$25 million.
15 And when you look at the \$6 billion and counting and
16 where we are on Yucca Mountain, you see that times
17 have changed a bit. But I'm doing this to put it in
18 perspective on what it means when we made our
19 recommendations. This was certainly in the back of
20 our minds, at least it was in the back of my mind,
21 when we were talking about this.

22 The other thing I wanted to talk about or
23 say in putting it in perspective, any private company
24 that operated on that basis would have taken 50 years
25 to get close to solving or maybe getting close to

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1 solving the problem, obviously, would be out of
2 business.

3 Well, we weren't asked that question and
4 we didn't, obviously, try to answer it. We also
5 looked, and I'll say a few more words about it and did
6 say something about it, about we're asked to look at
7 DOE's recommendations. And as you know, in some
8 cases, they talk about doing things in perpetuity,
9 which means infinity. And the question is how is that
10 possible? It's like the million years that you people
11 here at NRC are going to have to wrestle with very
12 shortly when they get an application. I mean, it's
13 insane on the face of it, as far as I'm concerned, in
14 my own views, obviously.

15 The next thing that we did in the
16 committee is we set up an ideal case. What would we
17 like to see in an ideal case? What would be the best
18 possible thing that could happen? Of course, we would
19 like to see 100 percent retrieval. Get all of the
20 waste out of the tank, but leave the tank bodies
21 themselves behind, the cost and the worker risk of
22 excavating the tanks is just out of proportion to the
23 reduction and the risk that they will represent.

24 The second thing we would like to see is
25 100 percent separation of the radioactive material

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1 from the nonradioactive material. This would reduce
2 the cost enormously of treating the radioactive waste.

3 And the third thing we would like to see
4 is that the radioactive end waste would be bound up in
5 some fashion that it would last in perpetuity,
6 obviously, none of that is possible. So the question
7 is what is feasible? And we also point out we need to
8 do that taking into account the other wastes that are
9 on the sites, the other sources of radio -- dosages of
10 radioactive material and dosages to the people and to
11 the environment and to the workers.

12 Because if we did the ideal thing, the
13 dosages to the workers would be the main risk.
14 Whereas, the dosages to the public would be remarkably
15 reduced. We knew we had to back off of that, because
16 that was not possible. And then our first major
17 finding is that we believe that DOE's overall approach
18 for management and disposal of tank waste is
19 applicable. When we say the overall approach, we mean
20 the retrieval, the stabilization and the disposal, but
21 there are still very many important technical and
22 programmatic challenges.

23 The essential question that's in the back
24 of everybody's mind is how clean is clean enough? How
25 much do we really have to get out of there? Well,

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1 it's clear, from what I have said earlier and that's
2 one of the reasons I went through that other material,
3 that there's no single answer and that there are a
4 whole flock of things that need to be taken into
5 account, because of the very great differences within
6 the tanks, within the sites themselves, etcetera.

7 And I want to emphasize we're dealing with
8 all of these periods -- problems over a period of time
9 and so things are going to change, as they have
10 changed since those waste were actually put into the
11 tanks. And so we recommend that DOE should pursue a
12 more risk informed, consistent, participatory and
13 transparent process. And we believe very much that
14 this will produce a better decision and will reduce
15 the programmatic risk. And as you probably know, this
16 has been a mantra in recent Academy reports. They all
17 basically say this and we think that this will be a
18 better and more widely accepted solution.

19 The other thing I think people -- I think
20 we didn't appreciate ourselves until we actually got
21 to the point of doing it. That only two tanks out of
22 the 246 tanks at the three sites have been cleaned out
23 and backfilled with grout. None of them has a
24 permanent cover on this. And when you stop to think
25 how many years now plutonium production has ceased at

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1 these sites, this is a long time for this to take
2 place.

3 I don't want to dump on DOE. They are not
4 totally responsible for all of this. A lot of things
5 were beyond their control. And so since we're just at
6 the very beginning of this, this is certainly not an
7 introduction. We're not in an industrial mode here at
8 all. And I also should say that the two tanks were
9 among the easiest tanks, the simplest ones, were the
10 least problems. And so we haven't really tackled the
11 main problems of these tanks.

12 And so we say in our report there's still
13 time to develop the tools and the processes to address
14 these things and that DOE should initiate a very
15 targeted and aggressive R&D program and we make some
16 recommendations. If you look at the amount of money
17 that DOE has spent in research on this, not just
18 development but research, it's not commensurate with
19 the cost of cleaning up these sites, not even close to
20 the costs of cleaning up these sites.

21 So they have a lot to gain by doing a good
22 deal more of research. And eventually, this would
23 make the cost much less and would make the time to
24 complete the job much less than it is. Certainly, it
25 has been going on for a long period of time. There

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1 ought to be ways to hasten that.

2 Everybody in this room knows this sort of
3 flow diagram, so I'm not going to look at it. You can
4 look at it at your leisure if you like. Again, as you
5 know, Hanford and Savannah River are very similar to
6 Idaho. Sorry?

7 PARTICIPANT: Do you want to go back one?

8 DR. PARKER: That's it. Okay. One of the
9 first questions was does DOE know enough about the
10 tank waste characteristics? Now, if you'll look at
11 what's been done at all the sites, they have spent a
12 lot of time, a lot of money and everyone comes to
13 basically the same conclusion. There is very little
14 to be gained by regurgitating that material again.
15 They do know enough now to get the material out of the
16 tanks, but then to go further, they need to know the
17 waste composition in greater detail for processing
18 purposes. So this can only be done after the waste
19 comes out of the tank.

20 Okay. We also made a recommendation in
21 our interim report and mostly likely this raised DOE's
22 ire more than almost anything else, that they should
23 decouple the schedule for the tank waste retrieval
24 from tank closure. We believe, now, we say this in
25 the report, that there is little technical advantage

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1 to accelerated closure of the individual tanks. And
2 if the R&D program that we recommend is followed out,
3 then it would be possible to remove more of the waste
4 and hopefully in a shorter time and get closer to the
5 ideal of getting most of the waste out of there.

6 And I also point out in the report that
7 DOE, at the Savannah River site, is decoupling the
8 closure from the retrieval for some of the tanks. So
9 that's already in their own plants. And as we say, we
10 don't believe this needs to delay the final closure of
11 the tanks. Again, we make a very strong point that
12 decisions should not be based solely on schedule
13 conformance. If everything were done according to
14 schedule, obviously, we wouldn't be waiting 50 years
15 to close up the tanks as we are now.

16 We are happy to say that we believe that
17 the technical quality and the public transparency of
18 the DOE report has improved markedly over the last
19 year. And we certainly commend that. We have great
20 difficulty with some of the earlier documents. We
21 first noticed that difference in the responses to
22 requests for information by the U.S. NRC for their
23 review and those of the states, and we believe that
24 the DOE should continue to provide these transparent
25 independent peer review of critical data and analysis.

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1 I should point out that the Academy does
2 this, too. This report had 15 outside reviewers, 15
3 outside reviewers, and that's not the end, because the
4 Academy also has a Report Review Committee. And they
5 think that that is such an important -- to see that
6 the -- our committee responds to the outside
7 reviewers. They think it is so important that the
8 Report Review Committee is staffed only by Members of
9 the Academy. They have no outside people. So they
10 take peer review very seriously. And I personally
11 believe that every report and every decision, major
12 decision is improved by peer review.

13 One of the other things we were asked
14 about was post-closure. And as I said, none of the
15 tanks have gotten to this point yet, but we don't
16 think they can afford to neglect what they should be
17 doing at this time and that is to be making plans and
18 installing devices that would give them means of
19 monitoring the closure or the grout as they do it. So
20 it cannot wait 30 years before they come up with a
21 similar plan. They need to do it, but without great
22 haste, but with -- stay on the course.

23 We have specific recommendations for the
24 various sites. At Savannah River, we have doubts
25 about the plans for closure, point compliance and

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1 assumptions about exposure scenarios. We also --
2 based upon our belief that we should get as close as
3 feasible to the ideal state about the installation and
4 use of the DDA for longer periods of time, therefore,
5 leaving much more radioactive material on site. We
6 recommended that DOE should develop alternatives or
7 enhancements to solve the tank space problem.

8 At the Hanford site, we also have
9 reservations about the bulk vitrification process and
10 we think that that ought to be reviewed.

11 At the Idaho Laboratory, we thought they
12 were making really quite good progress.

13 We have other issues that we did not deal
14 with in quite as great length and some of which you
15 have already seen, the interwall spaces and the
16 double-wall tanks, the disposal of the calcite, the
17 bin waste at the Idaho site, that's not been done
18 without the actual waste, but we think it ought to be
19 tested with the actual waste and some problems about
20 whether or not the -- it's possible to have off-site
21 disposal of some of the Hanford tank waste in the
22 Idaho sodium-bearing waste and the philosophy and
23 methodology from the post-closure monitor.

24 And so we think they need to do some more
25 work on these items as well and we believe that how

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1 the Government will define perpetuity at the sites
2 that are unsuitable for unrestricted release.

3 You know, I've hit the highlights and I
4 just want to say a few more words and then I would
5 like to see if any of the committee members or staff
6 want to make corrections or other observations. We
7 had a very large committee, a very talented committee
8 and we see the names of the people here. Paul Craig
9 is not listed here, because he had already resigned
10 from the committee at the end of the interim report,
11 so his name does appear on the interim report and
12 mostly likely we should put down his name as resigned
13 as of a certain date.

14 And Rod Ewing for other professional
15 reasons which found that he had to withdraw as a
16 member, but we wanted his expertise so much that he
17 has agreed to stay on as a consultant and was very
18 helpful to that. And finally, I want to thank all of
19 the people that made it possible with this very tight
20 time line with all the very good cooperation and with
21 DOE people, both from D.C. and at the sites, the
22 contractor personnel, the U.S. NRC staff who are
23 looking at some of the very same issues and we've got
24 very detailed responses to their questions and state
25 regulators.

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1 We had two people on our committee, by the
2 way, who had been or is right now a state regulator,
3 so we had very good input from the state side, the
4 staff at the Yakama Indian Nation and our own National
5 Academy of Science National Research Council staff.
6 It was a privilege for me to serve as the chairman.
7 So as the staff can tell you, we had many sleepless
8 hours and arguments and incriminations, but we finally
9 got the report out and I think it's a good report,
10 considering all of the constraints.

11 I'm happy to answer any questions, but I
12 think perhaps, Allen, if you're agreeable, I'll ask
13 the other committee members if they would like -- and
14 staff if they would like to make any comments.

15 VICE CHAIRMAN CROFF: Yes, certainly. Let
16 me just go around the table, first, and I would
17 certainly like to hear any observations the rest of
18 the attenders might have, especially within sort of
19 your areas of interest within the report. I tried to
20 get sort of a diversity here to represent different
21 areas of interest, so, Milt, do you want to go first?

22 MR. LEVENSON: Okay. Well, let me say, as
23 most of you know, I have been on a number of Academy
24 committees over the year. I think this is the first
25 one where the first meeting of the committee a Member

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1 of Congress and two senior staffers from the Senate
2 staff showed up to let the committee know how
3 important they thought this study was. And that's
4 somewhat unusual attention, in my experience.

5 Two things which have happened since our
6 report was issued. The bulk vit process at Hanford
7 that Frank mentioned, we seriously questioned, it is
8 now the subject of DOE has established an external
9 Peer Review Committee and Ray Wymer, who is a former
10 member of the ACNW, is a member of that committee and
11 that just started a week or so ago.

12 And secondly, at Savannah River, they have
13 charted an external peer review group to look at Tank
14 48, that's the classic, maybe worst of the tanks which
15 has organic residues from in-tank process days. So
16 apparently some of the advice has been taken to heart
17 and actually those two reviews are underway already.

18 I just want to mention, I think the most
19 difficult things to cope with was even though the
20 guidance contained the so-called Commerce Clause,
21 namely look into anything else the committee thinks is
22 important, with a finite number of people, all of them
23 volunteers, and a deadline from Congress, it's not
24 really able to do that. But one of the things that
25 overhangs the whole business of cleaning up the tanks

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1 is that's like trying to do a jigsaw puzzle with only
2 the middle piece of it.

3 The question of how much you should leave
4 in a tank, clearly is related to how much you leave on
5 the same site in the burial grounds and what do you do
6 about things that have leaked. So these are issues
7 that were outside the scope of the committee. But in
8 the big picture, you know, cleaning up the tank to a
9 pristine state, even if that were possible, in the
10 middle of a large area of contaminated ground, doesn't
11 make a lot of sense either. So there remains really
12 a separate issue on how clean is clean enough and it
13 goes beyond the tanks. Anne?

14 MS. SMITH: There's sort of two
15 observations that I guess I'm prepared to make.
16 First, as we came into this, it seemed that the focus
17 was very much on what were the performance
18 assessments, how well were they being done and whether
19 there were additional actions or information that
20 would be needed to have a better understanding of
21 whether the performance objectives could be met.

22 And an interesting aspect of working on
23 this committee was that really those performance
24 assessments really weren't there at the beginning and
25 then they started to appear and they were evolving

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1 rapidly. And it was really very difficult for us to
2 opine very clearly on the quality of the work that was
3 going into them, although we did observe patterns and
4 trends that were showing an improvement and it had to
5 do with the iterative process with the NRC in
6 particular.

7 But also, I think what we tried to bring
8 out, and I think it came out pretty clearly in Franks'
9 presentation, is that really there's a broader set of
10 issues than just performing a good performance
11 assessment. There's really a whole risk decision
12 making issue here that needs to take into
13 consideration many issues that won't even appear in
14 the formal construct of the performance assessment and
15 I think that's sort of the, to me, key theme in the
16 report.

17 The decision making process has to be more
18 of a participatory process and one that takes into
19 account far more than just sort of the narrowly
20 construed definition of meeting performance objectives
21 through a performance assessment.

22 VICE CHAIRMAN CROFF: Okay. Kevin, Micah?

23 MR. LOWENTHAL: I'll just note one thing,
24 which is something that I don't think Anne or Milt
25 have heard, but Frank has heard. Ken Picha, who is in

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1 the audience here, indicated he works for DOE. He
2 indicated that DOE has constructed a matrix to track
3 all of the findings and recommendations in the report
4 and what they are going to be doing about each one.
5 And so this is just to mention that it sounds like DOE
6 is taking this very seriously.

7 DR. PARKER: Allen, do you want to take
8 your hat as chairman off and say something as a Member
9 of the Committee?

10 VICE CHAIRMAN CROFF: No, I don't think
11 I'm going to.

12 DR. PARKER: Well, I would like to
13 reinforce what Milt said, because we couldn't state
14 it. I didn't think we might get consensus on the
15 Committee. So in my prerogative as chairman, in the
16 preface, I emphasized the point that Milt just brought
17 up and we said we have refrained to some -- page X, we
18 have refrained from looking holistically at the
19 problem of environmental releases, because it was not
20 in our charter.

21 However, we would be remiss if we did not
22 call attention to other radioactive and hazardous
23 chemicals at the site that also can pose risks to
24 human health and the environment. As noted in the
25 report, the tradeoff between the cost and risk of

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1 retrieving the processing tank in this must take into
2 consideration risk from other waste and contamination
3 already committed to the site. So I think we -- I
4 thought behind -- when I heard the committee members
5 here, at least, all felt -- feel very strongly about
6 that part.

7 VICE CHAIRMAN CROFF: Okay. Anybody else?
8 Okay. Then let's put some questions here. Professor
9 Hinze?

10 MEMBER HINZE: Frank, I enjoyed your
11 presentation, but I would like to know a little bit
12 more about what your consideration was of the
13 materials that have been contaminated by leakage from
14 tanks. Did you consider that material as well as the
15 material in the tanks and how did you define it if you
16 evaluated it?

17 DR. PARKER: We didn't consider it
18 deliberately, because that would open up a whole flock
19 of other things that is not in our charter at all.
20 Where would we stop if we did that? Would we look at
21 all the things that settle all the way to the Columbia
22 River, all the things that went all the way to the
23 Columbia River from the tanks? I mean, we would be
24 looking at, you know, a great deal of the Hanford
25 site.

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1 MEMBER HINZE: Right.

2 DR. PARKER: But we did look a little bit
3 at the piping and the space between the inner wall and
4 the outer wall, but even there we didn't spend much
5 time in that.

6 MEMBER HINZE: You did mention the
7 monitoring centers. Are these within the tanks? Did
8 you look at them external to the tanks at all?

9 DR. PARKER: Well, at all of the sites,
10 there is a very wide network of monitoring outside the
11 tanks. We were looking at -- again, there is nothing
12 formulated yet, as I have already mentioned, about
13 putting in sensors within the tanks, within the grout
14 that would cover and within the vadose zone and
15 there's practically none of that kind of marking going
16 on in any of those sites.

17 MEMBER HINZE: Another question then. In
18 terms of the research that you suggested, how in depth
19 did you go to suggest research areas and topics and
20 approaches and methodologies and so forth?

21 DR. PARKER: We did it with a very broad
22 brush and the way we came up with the numbers, we
23 looked at the amount of money that is in the EMSP
24 program and used that as a guide. But as I said, I
25 don't think that's sufficient. If you just look at

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1 the total costs of the clean-up, there we should be
2 putting in much greater fraction of the resources into
3 that, because it would -- I think it will prove that
4 it will save a great deal of money in the future.

5 And I know that in private discussions
6 that I have had with EM-1, Jim Rispoli, he feels very
7 strongly that they have to have a much more aggressive
8 R&D program than the EM program.

9 MEMBER HINZE: Did you prioritize these
10 research?

11 DR. PARKER: No.

12 MEMBER HINZE: No. Okay.

13 DR. PARKER: We did not.

14 MEMBER HINZE: I'll pass.

15 VICE CHAIRMAN CROFF: Micah, you want to
16 add something?

17 MR. LOWENTHAL: Yes, if I can just add
18 that there is actually a whole chapter, Chapter 9 of
19 the report, that is devoted to research and
20 development and so there are some specific
21 recommendations there, but most of them are pretty
22 high level as Dr. Parker mentioned.

23 I should also mention that the legislation
24 coming out of the House right now, at least on the
25 Armed Services Committee, which requested this, put

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1 \$20 million into the R&D program for dealing with tank
2 waste. I think they were not particularly more
3 specific than that, but this looks like it's a direct
4 result of the recommendations here.

5 MEMBER HINZE: Are there -- if I may?

6 VICE CHAIRMAN CROFF: Go ahead.

7 MEMBER HINZE: Is there a DOE advisory
8 group that is looking at the kinds of research and
9 prioritizing the research into the tank remediation?

10 MR. LOWENTHAL: Well, I can't speak to
11 what DOE is doing on that, because I don't know. But
12 the recommendation in the report is for competitive
13 grants. And so that would require something like that
14 Steering group.

15 MEMBER HINZE: Okay. Nothing else. Thank
16 you.

17 VICE CHAIRMAN CROFF: Well, come to a
18 microphone and name an affiliation and then --

19 MR. PICHA: Hi, my name is Ken Picha. I'm
20 with the Office of Environmental Management and I'll
21 say a little bit and my colleague, Marty Louterneau,
22 perhaps knows a bit more. This came at a good timing,
23 as Frank said, with regard to some of our preparation
24 activities for '08 as well as trying to see what we
25 can do with '07, this is for '07, and so we're

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1 certainly vigorously looking at what kind of
2 opportunities we can do in the R&D arena based on
3 that.

4 Actually, this last week, we had a
5 technical interchange workshop between representatives
6 from Hanford, Idaho and Savannah River. It's an
7 annual activity where they try to exchange where the
8 sites are in terms of their different tank waste
9 programs, including looking at things like where their
10 technology development needs are. And coming out of
11 that, we're hoping there is going to be some specific
12 recommendations.

13 We're also, next week, reorganizing. The
14 EM organization is reorganizing and so -- but also --
15 yes, I know, it's time, right? It's been a year or
16 two, so it's time. But nonetheless, all these
17 activities together will, I think, help us to focus a
18 little bit more on the R&D needs and where we need to
19 put some of our efforts, particular in the tank arena.
20 Do you want to say anything else?

21 MR. LOUTERNEAU: Yes, I'm Marty Louterneau
22 and a colleague of Ken's. I've been working on the
23 tank closure project and I'm also the chairman of EM's
24 Low Level Waste Disposal Facility Federal Review Group
25 and this is the organization that in addition to

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1 conducting the peer reviews of our low level waste
2 disposal facility performance assessments, also
3 develops guidance and recommendations for the
4 preparation and conduct of our performance assessments
5 and our waste management activities.

6 We had our annual business meeting three
7 weeks ago and one of the primary recommendations
8 coming out of that meeting was for the development of
9 a more focused R&D effort, specifically on the issues
10 of tank closures and related to waste forums and
11 retrievals and, hopefully in the next two weeks,
12 that's going to be part of our recommendation package
13 that we're going to be briefing to EM-1.

14 VICE CHAIRMAN CROFF: Okay. Thank you.
15 Milton?

16 MR. LEVENSON: I might make a couple of
17 comments in response to Bill's question. The question
18 of did we look at other waste, you know, this study
19 grew out of Congressional action necessary and the
20 question of reclassification, which is a political
21 legal technical issue, and our charter was
22 specifically to look at the wastes in the tank.

23 We couldn't help put in the report and in
24 the preface notice there are other problems. I think
25 you are familiar enough with the Academy studies to

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1 know that if we had expanded the scope beyond that, it
2 wouldn't have made it past the review board. So just
3 because the report doesn't address the other issues,
4 doesn't mean we don't think it's important.

5 Secondly, our review of monitoring really
6 wasn't focused on what they are doing now or what they
7 have done in the past. Our concern was how do you
8 plan ahead, so you could monitor after the tank farms
9 are closed, capped, etcetera, the much longer range
10 view, which is somewhat different than the current
11 monitoring?

12 VICE CHAIRMAN CROFF: Very helpful
13 remarks. Thanks, Milton.

14 MR. LEVENSON: Thanks.

15 VICE CHAIRMAN CROFF: Mike?

16 CHAIRMAN RYAN: Thanks, Frank, for a great
17 summary. It's a formidable task in the time scale
18 involved. One of the things that we were involved in,
19 the ACNW, I and Latif Hamdan attended a tank cleaning
20 workshop that was held in Atlanta at the end of March
21 and it was interesting, because I'm on your slide 16
22 where you recommend that DOE should initiate a
23 targeted aggressive collaborative research program and
24 so on.

25 Could you just maybe put that up for

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1 everybody's benefit? And I found this conference to
2 be pretty interesting, because it brought together all
3 the folks you mentioned, Idaho, Savannah River,
4 Hanford and actually West Valley. So we got into a
5 little bit of the vitrification. And a large
6 component of folks from the service industry, let me
7 just call it that for lack of a better term, that are
8 expert in cleaning technologies from anything you can
9 think of, from water-based technologies to others.

10 And I found it to be an interesting
11 technical meeting from the standpoint of they really
12 were working hard to explore state of the art and
13 what's needed and what's coming next. So from that
14 standpoint, it was pretty satisfying. Some of the
15 NMSS staff with responsibilities for review activities
16 here within the Agency also attended and had the
17 benefit of those discussions.

18 So I just wanted to, you know, mention to
19 you and the Committee that it seems like that
20 recommendation is also being acted on. So I find it
21 to be an excellent technical meeting. In addition, I
22 gained a stronger appreciation for the fact that these
23 tank clean-outs are not easy. You know, I think about
24 radiation protection when I look at a complex sludgy
25 mess of pipes, of tanks and manholes and all of that

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1 and a formidable part of the planning for all the
2 activities is clearly focused on worker protection
3 from industrial safety and radiation safety point of
4 view.

5 So I think sometimes we talk about the
6 waste independent of the actual work to manage it and
7 we have to remember that the folks that are doing the
8 work have significant challenges to make sure that
9 workers are protected and that ALARA is maintained and
10 hopefully that balance of total radiation protection
11 will be part of the equation when we get to thinking
12 about closure and disposal in terms of residual
13 radioactive material.

14 How many sieverts should we expend to
15 save, theoretical sieverts down the line? So that
16 aspect of it became very clear in this conference.
17 And I just wanted to offer that comment and
18 observation as a contemporaneous activity that really
19 addresses the recommendation you've got in your
20 report. Thanks. Any questions?

21 VICE CHAIRMAN CROFF: No, I don't have any
22 other questions.

23 CHAIRMAN RYAN: Okay.

24 VICE CHAIRMAN CROFF: Thanks. Dr. Weiner?

25 MEMBER WEINER: Thank you and I would

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1 really like to thank the Academy and Dr. Parker for a
2 very informative report. I wanted to ask you in 1986
3 under the leadership of Mike Lawrence, who was at that
4 time the director at Hanford, a report was issued by
5 a committee, Citizen's Committee that Mike Lawrence
6 put together and we looked -- I served on the
7 committee and fortuitously, I represented the Sierra
8 Club on that committee.

9 We put together a report with some
10 recommendations regarding the 149 single-shell tanks
11 at Hanford. And I wondered if that document had ever
12 surfaced in your study, because there was no reference
13 made to it.

14 DR. PARKER: Was it in the bibliography?
15 We certainly didn't examine it in any detail, that's
16 for certain. I'm not aware of it.

17 MEMBER WEINER: Oh, it's very interesting.
18 I would be happy to have a copy made. This was pre-
19 computer, so all I have is my hard copy. But it might
20 be of interest, especially in some of your comments
21 about transparency and risk assessment. The committee
22 consisted of 30 people and had representatives from
23 the State Legislatures of both Washington and Oregon,
24 representatives from the Department of Energy and its
25 contractors, citizen -- several citizens groups, it

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1 was very wide ranging, Members of Congress, a Member
2 of the staff of then Senator Henry Jackson was a
3 member of the committee.

4 The recommendation and -- we looked at all
5 manner of address to, just as you did, what was in the
6 tanks and we even have a publication on what
7 radionuclides posed the greatest risk, which was
8 interesting to do. Our recommendation was to look
9 more closely at stabilization in place, precisely
10 because of the occupational hazards, this was 20 years
11 ago, incident on removing everything from the tanks.

12 We had one member who suggested that
13 everything, including the tank, be dug up and we
14 rejected that. But my question is what is the basis
15 for your 100 percent retrieval and 100 percent
16 recommendation, 100 percent separation recommendation,
17 and were there considerations given at least to the
18 Hanford tanks to stabilization in place with covers?

19 DR. PARKER: I don't believe that I said
20 that we should have 100 percent retrieval.

21 MEMBER WEINER: Oh.

22 DR. PARKER: I believe I said the ideal
23 case would be that, because that would remove all of
24 the waste from the site.

25 MEMBER WEINER: I see.

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1 DR. PARKER: And I also pointed out that
2 that would be at increased worker risk. And I might
3 point out, I think it was the first Academy report on
4 Hanford that Konnie Krauskopf chaired and in that he
5 said that removing the waste from the tanks at Hanford
6 should be approached with great caution, that one
7 should look at the possibility of stabilizing it in
8 place.

9 MEMBER WEINER: That's --

10 DR. PARKER: I don't remember the exact
11 date, but it certainly must be in the '60s sometime.
12 But I think the problem with that is proving that they
13 are stabilized.

14 MEMBER WEINER: I was just curious to the
15 extent to which this report looks at stabilization in
16 place.

17 DR. PARKER: We did not look at that
18 explicitly. The charge to us was to look at whether
19 or not it could be considered low activity waste that
20 would be right there.

21 MEMBER WEINER: I have one other question.

22 DR. PARKER: Yes?

23 MEMBER WEINER: When we looked at the
24 Hanford tanks in the 1980s, we were assured and it was
25 to some extent demonstrated that the material had

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1 largely been dewatered. Did you find that to be the
2 case?

3 DR. PARKER: I don't think that's the case
4 at all.

5 MEMBER WEINER: Okay. Thank you.

6 MR. LEVENSON: It is in the single-shell
7 tanks.

8 MEMBER WEINER: In the single-shell tanks.

9 DR. PARKER: I have to disagree with my
10 colleague. It has a great deal of entrained captured
11 water in there. So in that sense, the mobile water
12 has been removed. I agree with that. But that
13 doesn't mean it's a totally dry system at all.

14 MEMBER WEINER: No, we only looked -- when
15 they said dewatered, they only meant the mobile water.

16 DR. PARKER: Yes.

17 MEMBER WEINER: They did not mean -- and
18 that's why I wondered. We knew there was water
19 entrained.

20 DR. PARKER: Yes.

21 MEMBER WEINER: Thank you.

22 VICE CHAIRMAN CROFF: Okay. Micah?

23 MR. LOWENTHAL: Yes. On this question of
24 stabilization in place, one thing we should probably
25 point out is that both DOE's internal orders and the

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1 law that was created in conjunction at the same time
2 as this study was mandated requires that the waste be
3 removed from the tanks to the maximum state practical,
4 so they are required to do that regardless. And so
5 the committee wasn't looking at the possibility of
6 stabilizing the entire contents of the tank in place.
7 However, whatever is left, it is a stabilize in place
8 sort of situation.

9 MR. LEVENSON: It is also complicated by
10 a legal commitment via the Tripartite Agreements the
11 DOE has signed to get the stuff off the site. So it
12 wasn't this committee's function to disagree with
13 legal contracts.

14 DR. PARKER: If I could go outside of what
15 we actually reviewed just based upon the knowledge of
16 the conditions there itself, we recognize that it's
17 almost impossible to get a representative sample in
18 those tanks. That means that you can't stir it up
19 enough to get it uniformly, and so then to stabilize
20 it, you would have no idea whether it was going to be
21 really stabilized well or not and there have been some
22 attempts to do some things of that sort with somewhat
23 disastrous results. And so I don't think there is a
24 technical basis that would warrant it at this time.
25 The law also precludes it.

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1 VICE CHAIRMAN CROFF: Okay. Dr. Clarke?

2 MEMBER CLARKE: Thanks, Frank. With
3 respect to your, I think, very excellent
4 recommendation about it's not too soon to start
5 thinking about post-closure monitoring and sensors and
6 how all of that would integrate with the cover design
7 as well, I was reminded that I think in one case, I
8 want to say Fernald, but I could be wrong, the cover
9 of the first disposal cell, I think, was actually
10 retrofitted to install sensors. So this is not too
11 soon to be thinking about these things.

12 I had a question which is probably
13 premature, but I think your presentation mentioned it
14 in passing. You showed us a slide that gives a real
15 nice summary of the differences in the natural
16 environments for these three sites. And you had a
17 backup slide on a cover design which is a --

18 DR. PARKER: That's what I was trying to
19 bring up when I screwed up the system.

20 MEMBER CLARKE: Okay.

21 DR. PARKER: I think it's the very last
22 one. The second to the last.

23 VICE CHAIRMAN CROFF: Okay. Go ahead,
24 James.

25 MEMBER CLARKE: Well, all I was going to

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1 say, Frank, is you had a summary of the natural
2 environment at each of these sites.

3 DR. PARKER: Yes.

4 MEMBER CLARKE: And a backup slide under
5 modified RCRA Subtitle C28, we don't need it, but --
6 and I guess, Frank, what I was wondering is is there--
7 again, this question may be premature, because it
8 doesn't sound like you were able to do too much on
9 this piece, but will there be a recognition that these
10 natural environments are different, Hanford and Idaho
11 being more similar and Savannah River being a little
12 more different, so that there's flexibility in the
13 design or is this the point?

14 DR. PARKER: At least in my list it's
15 slide 13, where it shows the differences at the sites
16 and it mentions that each tank or group of tanks have
17 to be looked at individually. So I mean, I think,
18 that's a very strong recognition.

19 MEMBER CLARKE: The reason I bring it up
20 is I think Idaho has had a successful demonstration
21 with an evapotranspiration cap, they probably looked
22 at for other purposes, but I just wonder if that
23 flexibility is there.

24 DR. PARKER: Well, we certainly have
25 recommended that, but it's individual decisions in

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1 each tank or group of tanks at each site.

2 MEMBER CLARKE: Thank you. It was a very
3 nice summary.

4 VICE CHAIRMAN CROFF: I would like to
5 invite, I'm not sure who, which of you, to sort of
6 summarize, let me call it the reactions to the report,
7 subsequent to the publication of the report, I mean,
8 as briefed to the people who asked for it, to
9 Congress, to DOE of course. I think there were
10 briefings to the states and sort of what kind of
11 reactions are you seeing to these recommendations.

12 We have heard a little bit of it as we
13 have gone through how DOE has reacted and some events
14 that have occurred, but I would be interested in a
15 more general discussion about who.

16 MR. LOWENTHAL: This report was briefed to
17 DOE and to Congress, who originally requested it.
18 There was a briefing for NRC and the states via
19 conference call and there have been sort of more
20 informal discussions otherwise and there has been some
21 dissemination. And I would say that probably Congress
22 was the most receptive to this.

23 I think when we spoke to the staffers and
24 in what we have heard following up, they found it very
25 useful. It addressed the questions that they were

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1 looking at and I think we have seen some responses.
2 As I mentioned, there has been some funding put in, at
3 least the bill for dealing with R&D issues which was
4 something that they said, well, you know, clearly
5 funding is our responsibility and so they took that
6 up.

7 DOE has had a mixed response to it. DOE
8 was very receptive to some of the messages in the
9 report and disagrees with some of the recommendations,
10 including the decoupling recommendation that Frank
11 mentioned. So it's a mixed bag, as you would expect.
12 We have not gotten any direct response from any of the
13 states and we haven't heard very much from them. It's
14 possible that other people have, but we haven't.
15 There was not -- they were being pretty cautious about
16 it, I think. They were taking in the message and not
17 pushing on it too hard.

18 Now, after the interim report, which was
19 focused on Savannah River, South Carolina said that,
20 you know, representatives in their Regulator's Office
21 said that they disagree with the decoupling
22 recommendation, because it had first appeared in that.
23 And they basically said, you know, we have an
24 agreement to make progress on closing these. We think
25 it's safest to do that, and so they want to stick to

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1 their schedule. And so I think there is a definite
2 disagreement particularly with South Carolina on that
3 issue.

4 Besides that, I don't -- we haven't gotten
5 any formal feedback from the Nuclear Regulatory
6 Commission, although I would expect that they would be
7 reasonably happy because the report is very
8 complimentary to the work that the Commission staff
9 has done on this and really emphasizes the value of
10 peer review. I think that DOE recognizes that to some
11 extent and I think that the Commission has it
12 ingrained as part of its culture, that this is some --
13 you know, review is a necessary part of any action.

14 VICE CHAIRMAN CROFF: Okay. Thanks.
15 Dave, have you got any questions?

16 MR. KOCHER: The question came up about
17 looking at risks in a more holistic fashion rather
18 than just a specific compliance point for a specific
19 tank or tank farm or whatever. DOE does have this
20 composite analysis process that in some sense tries to
21 do that, and I'm wondering to what extent your
22 committee looked into their composite analysis
23 process.

24 Did you review specific reports that these
25 sites had produced and what did you think of it?

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1 DR. PARKER: I don't think in any of the
2 reports we reviewed on individual tanks that there was
3 any mention of composite analysis.

4 MR. LOWENTHAL: Actually, each site has a
5 composite analysis of some kind and so the Savannah
6 River site does have a composite analysis.
7 Unfortunately, the composite analysis for the Savannah
8 River site does not have any of the data on the recent
9 decisions. And so the source terms that they are
10 using in their analysis there are outdated. It hasn't
11 been updated recently and I think it's scheduled for
12 update next year or something like that.

13 But it doesn't take into account any of
14 the changes that have occurred in planning for the
15 saltstone vaults, which means an increase by orders of
16 magnitude in the amount of radioactive material going
17 there, doesn't account for changes in planning for the
18 tanks and it doesn't account for certain other changes
19 on the site. So that one was not up to date. The
20 Hanford site, they have their, what is that system,
21 the system assessment capability, their SAC.

22 In that case they are actually -- the site
23 is spread out enough that you don't have as much
24 source term interaction or you don't have as much
25 plume interaction and there wasn't as much concern

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1 about that, but they are developing a more integrated
2 view of the groundwater on the site and the report
3 specifically notes that for that site.

4 At Idaho it's most isolated. You know,
5 the actual locations within the site are so far apart
6 that it's possible to just look at the tank farm and
7 worry just about the tank farm. The only issue there
8 is that they have leaks that are already in place and
9 that has been the focus of most of their work so far.
10 So they are a bit out of step between the composite
11 analysis, the sort of integrated view of the whole
12 site, versus what they are doing for the tank farms
13 specifically.

14 VICE CHAIRMAN CROFF: Okay. Latif?

15 MR. HAMDAN: Yes. The question I have is
16 concerning the recommendation on decoupling of removal
17 of the waste and the tank closure, and the question is
18 when the Committee made their recommendation, was the
19 recommendation rooted in the economics or does it have
20 a safety component as well?

21 DR. PARKER: Well, we looked at a few
22 tanks where they have actually done the cleanup and in
23 one instance, for example, they used the same
24 technique quite a number of times and when they saw no
25 further improvement in removing waste, they stopped at

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1 that point.

2 And we said that it would have been
3 advisable to look at other techniques, but we never
4 did, and I don't think they did, look at the
5 difference in the risk reduction per unit of effort
6 utilized. That's a topic we said was extremely
7 important when you looked at it from a holistic point
8 of view. I don't know, Anne, do you want to --

9 MS. SMITH: Well, yes. There really was--
10 I would say it was mainly focused on the safety issue
11 and the tradeoff. I think of safety as worker risk
12 and long-term risk, the tradeoff between those that
13 you're making if you choose to close the tank right
14 away on a schedule. So there really wasn't an
15 economic component in my mind to it at all.

16 There would be an economic question if you
17 were to say yes, we could delay the closure and clean
18 out more. Then there is also a question of is it
19 worth spending the money that that would take to clean
20 out more, but that wasn't really behind the
21 recommendation so much as simply we don't see a
22 significant added risk by waiting a few years to see
23 if we could clean it out more through other methods,
24 but we do see some potential long-term benefits from
25 that.

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1 And then, of course, worker risk would
2 come in once you say, well, what would be the method
3 to clean it out if you do find a method to get a
4 greater amount removed, but we didn't even really get
5 to that step other than to acknowledge that it should
6 be considered.

7 MR. LEVENSON: This was kind of a
8 philosophical question, Latif, so different Committee
9 Members had different views. I think the thing we
10 looked at first from a safety standpoint was was there
11 any risk once you removed as much as you could to
12 delay grouting it and we couldn't identify any safety
13 risk, exposure to people or anything by letting it
14 sit.

15 And if your philosophical objective is to
16 remove as much as possible, particularly with some of
17 the tanks which are very complex, cooling clouds that
18 by the time you got through the next 30, 40, 50 tanks,
19 you would probably have advanced technology that would
20 allow you to clean better. Then you would make the
21 decision, economic and exposure work, should you go
22 back to one of the tanks that you could go back to
23 because you now have an advanced technology. So it's
24 sort of a philosophical let's not close the door on
25 being able to get out more.

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1 CHAIRMAN RYAN: Milt, there was a
2 practical example that was discussed at that workshop
3 I mentioned that is kind of on point with what you're
4 talking about, and the idea was that there was an area
5 where it was hard to get to the stuff that needed to
6 be removed. So they are actually talking about, well,
7 if we could create a grout platform with the fill
8 grout, that would allow us to get to the area easily
9 with the right equipment and all of that and maybe
10 excavate that remaining grout that needed to be
11 removed, and there might be a residual rim around it.

12 But, you know, as a very practical
13 approach though, well, we can maximize what we remove,
14 but there has got to be a little creative thinking on
15 how we do the engineering and all the work that needed
16 to be done from a practical standpoint to make that
17 happen. So, you know, it's interesting to think about
18 it as a concept. But then, you know, as you turn it
19 into real work sometimes you have to, you know, look
20 at a combination as you go along, and I think
21 recognizing that eventual scheme would be helpful.

22 DR. PARKER: If you look at Item No. 4
23 that we were asked, they asked us to do explicitly
24 what you have said, assessment of the cost
25 consequences for worker safety and long-term

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1 consequences for environmental and human health, and
2 we explicitly say in the report, because there was so
3 little data available from DOE itself, that we just
4 could not do a reasonable analysis of the question
5 that you asked.

6 MR. LOWENTHAL: Frank just --

7 CHAIRMAN RYAN: Yes, and I offer my
8 comment not as a criticism of the report, but
9 recognizing that flexibility when you do get to that
10 real kind of decision making is always a reasonable
11 way to go.

12 MR. LOWENTHAL: Frank just made the point
13 that I was going to add, and one other thing that is
14 mentioned in the report is that it would be very
15 useful if DOE kept careful track of the worker doses
16 and the costs involved as they make progress here,
17 because there was so little to work from in decision
18 making as we looked at it at this point.

19 VICE CHAIRMAN CROFF: Okay.

20 MEMBER WEINER: Allen, could I ask another
21 question?

22 VICE CHAIRMAN CROFF: Sure.

23 MEMBER WEINER: Excuse me for intruding
24 with this, but one of your recommendations is that the
25 Committee also has reservations about the bulk

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1 vitrification process and I was just curious as to
2 what the reservations were, what your view of that
3 process was at Hanford.

4 DR. PARKER: I could try, but Milt is our
5 expert on that, so I will defer to him.

6 MR. LEVENSON: Strangely enough, probably
7 safety. The idea that you could vitrify one-third of
8 the waste in a plant costing a billion dollars behind
9 concrete walls of ultimate seismic, etcetera,
10 etcetera, and maybe two-thirds of the waste you are
11 going to vitrify in a shipping container without even
12 a building around it, and the assumption that you
13 would have no off-gas problems, there were just a
14 large list of questions to which there were no answers
15 that satisfied the Committee.

16 And, as I say, there is right now a rather
17 senior review group doing a review for DOE. Ray
18 Wymer, who was formerly a member of the ACNW, is on
19 that review.

20 MEMBER WEINER: Do you envision that some
21 similar process, some similar stabilization process --
22 I mean, you're going to have to do something with the
23 material that is removed from the tanks.

24 MR. LEVENSON: Well, the other thing it
25 points out in the report is that Idaho for a similar

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1 group of material had selected steam reforming, and it
2 wasn't obvious to the Committee what the large
3 difference was and why you needed to develop several
4 different things. It also pointed out in the report
5 that bulk fit was at the beginning of a research
6 program.

7 Steam reforming selected by Idaho operates
8 on a commercial basis in Tennessee for large amounts
9 of the waste from civilian nuclear plants. I think
10 that is a facility licensed by the NRC, in fact, and
11 that DOE ought to look seriously into that whole
12 issue.

13 MEMBER WEINER: Thank you.

14 VICE CHAIRMAN CROFF: Thanks. Anybody
15 else on the staff? I think, at this point, I would
16 like to -- anybody from the Department has any comment
17 or any updates on what is going on? You don't have to
18 do this, but does anybody want to say anything? No?
19 Okay.

20 Mike, you got a point you want to make?

21 CHAIRMAN RYAN: Yes. I want to take
22 advantage of the fact that the Academy is back two
23 months in a row. We had the benefit of the report on
24 the transportation report and some comments that came
25 up from those presentations piqued my interest about

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1 driver doses.

2 Kevin commented on the concern or a
3 question about it, so I actually went back and spoke
4 with the folks at Chem-Nuclear and have a letter from
5 Bill House summarizing actual driver doses from 1976
6 through 1994, and I will just pull up the -- and I
7 will certainly be happy to provide you with a copy of
8 this because it came to us.

9 For those years the number of drivers, of
10 course, started out small, increased and now has
11 decreased a bit from three or four or a few in the mid
12 '70s up to 45 or so in the mid '80s and then it has
13 trailed off a bit since there per year. The average
14 dose in the '70s was about 350 millirem. In the '80s
15 it was 90 millirem and in the -- I'm sorry, the '80s
16 90 millirem and in the '90s 58 millirem per year per
17 driver.

18 So the notion that -- and, of course,
19 everybody realizes that the dose rate limit in the cab
20 is independent of high level waste or low level waste.
21 People have challenged and said, well, with low level
22 waste you have less dose in the cab and that is not
23 true, because they designed the shielding to maximize
24 the payload and meet the requirements. So there is
25 not a lot of excess shielding there, so that 2

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1 millirem per year is really an appropriate benchmark
2 for both.

3 If you average all years in all drivers,
4 it's about 138 millirem per year. So there is no
5 question in my mind that any limit or any guidance
6 point of any kind would be challenged by the actual
7 data for that fleet that transports low level waste
8 around the United States. So just a benchmark for
9 everybody's benefit, so I will be happy to provide
10 that for our record and for anybody that wants a copy.

11 VICE CHAIRMAN CROFF: Thanks.

12 CHAIRMAN RYAN: Thanks, Allen.

13 VICE CHAIRMAN CROFF: Thanks, Mike.

14 CHAIRMAN RYAN: I just didn't want to pass
15 up the opportunity to share that with the Academy
16 while we're all together again. Thanks.

17 VICE CHAIRMAN CROFF: Okay. Well, seeing
18 no more hands up and nobody wanting to ask a question,
19 I would like to thank all of you very much for coming.
20 It was a very informative presentation and I think the
21 background is going to help us a lot as we move
22 forward here looking at waste determination issues.

23 I would note, I think at least some of you
24 know this, but at 10:45 we're going to have a briefing
25 from NRC staff on their Standard Review Plan

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1 concerning waste determinations. So if you're still
2 interested in the area, you're of course welcome to
3 attend. I think with that, let's take a break until
4 10:15 and then we'll reconvene and I think we'll --

5 CHAIRMAN RYAN: We have a short finishing
6 job to do to on Professor Hinze's letter.

7 MEMBER HINZE: A little more work done.

8 CHAIRMAN RYAN: Okay. All right. Fine.
9 So we'll just reconvene. Do you want to start a
10 little early or is that all right?

11 MEMBER HINZE: I don't know if we can get
12 the --

13 MR. HAMDAN: I'm not sure. I'm not sure
14 it will stick.

15 CHAIRMAN RYAN: The original schedule.

16 MEMBER HINZE: Yes, stick to the original
17 schedule.

18 VICE CHAIRMAN CROFF: We'll be back here
19 at 10:45 then.

20 (Whereupon, at 9:53 a.m. a recess until
21 10:45 a.m.)

22 CHAIRMAN RYAN: Come to order, please.
23 Take your seats. Thank you. I would like to resume.
24 We have got -- now, we're going to hear from the NRC
25 staff on the Standard Review Plan for Waste

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1 Determinations. We have got, I guess, Ryan Whited,
2 Christine, Christianne, I'm sorry, Ridge and David Esh
3 and I'm not sure who is going to start. Ryan, take it
4 away.

5 MR. WHITED: Thank you, Dr. Croff. I am
6 Ryan Whited. I am Chief of the Low Level Waste
7 Section in DWMEP. I am pleased to be here today to
8 discuss our progress on a Standard Review Plan for our
9 reviews of DOE incidental waste determinations. With
10 me today are Dr. Christianne Ridge, Dr. Dave Esh,
11 members of the performance assessment staff in DWMEP.

12 CHAIRMAN RYAN: And just to make sure, do
13 we have a bridge for anybody at SRS or do we have them
14 wanting to call in or --

15 PARTICIPANT: I thought we were finished
16 with the bridge.

17 CHAIRMAN RYAN: Are they finished? They
18 didn't want to be on this call?

19 PARTICIPANT: I thought they got off the
20 line. The bridge is still up.

21 CHAIRMAN RYAN: Is there anybody on the
22 phone?

23 MR. ROSENBERGER: Yes. This is Kent
24 Rosenberger, Savannah River.

25 CHAIRMAN RYAN: Okay, Kent. I just wanted

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1 to make sure if you wanted to be on that you were on.
2 Thanks for chiming in.

3 MR. ROSENBERGER: Thanks, Mike.

4 CHAIRMAN RYAN: Okay.

5 MR. WHITED: Okay. Dr. Ridge and Dr. Esh
6 will discuss some of the technical issues addressed in
7 the SRP. My portion of the presentation will include
8 a brief background discussion, a high level overview
9 of the SRP and a general discussion of how the
10 recommendations provided in ACNW's December letter
11 were addressed.

12 I know the Committee is familiar with
13 incidental waste, so I'm not going to spend time
14 discussing the criteria or previous waste
15 determination reviews. Our focus today will be on
16 those chapters of the SRP that relate to the major
17 areas of our reviews.

18 As you know, the SRP is not yet publicly
19 available, so our presentation and any questions and
20 answers today will need to recognize that. We do
21 expect the SRP to be issued next week for a 60 day
22 public comment period and if the Committee so desires,
23 we would be happy to come back in a few months to
24 answer any questions you have following your review of
25 the document.

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1 After my remarks, Dr. Ridge will address
2 the criterion regarding removal of radionuclides to
3 the maximum extent practical and Dr. Esh will focus on
4 two of the performance objectives in 10 CFR 61 Subpart
5 C, protection of the public and the associated review
6 of a performance assessment and protection of
7 intruders.

8 First, some brief background. The NDAA
9 was passed on October 28th of 2004. In mid-November
10 of '04 we briefed the ACNW on the staff's incidental
11 waste activities and we subsequently developed a
12 Commission paper that described in detail the staff's
13 plans for implementing our new responsibilities under
14 the NDAA, which included the development of a Standard
15 Review Plan to guide our reviews and provide
16 consistency across reviewers.

17 That paper was sent to the Commission on
18 April 28th of 2005 and we received the SRM on June the
19 30th of '05. In the SRM the Commission approved our
20 plans with a few comments. They noted that the staff
21 should take the time necessary to complete its reviews
22 and also to ensure that the technical basis for our
23 decisions are transparent, traceable, complete and as
24 open to the public and interested stakeholders as
25 possible. And, certainly, we feel that we have been

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1 implementing this direction in our NDAA activities
2 thus far.

3 ACNW held a two day public working group
4 meeting on incidental waste in August of '05 and NRC
5 staff provided a presentation at that meeting. We
6 also held a public scoping meeting in November of 2005
7 to obtain comments and recommendations on the contents
8 of the SRP. We had a very good exchange at that
9 meeting and following the meeting we received three
10 comment letters from the South Carolina Department of
11 Health and Environmental Control, the Savannah River
12 Site Citizens Advisory Board and the State of
13 Washington.

14 As you know, the NDAA requires a
15 determination of the waste class, either Class C or
16 less or greater than Class C. Due to the high
17 interest of various stakeholders, as well as DOE's
18 stated need for additional guidance on the application
19 of NRC's concentration averaging principles to waste
20 determinations, staff issued draft guidance on this
21 particular issue in December of '05. The
22 concentration averaging guidance is specific to
23 situations likely to be encountered by DOE in its
24 waste determinations, and Dave will touch briefly on
25 this guidance later in the presentation.

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1 We received six comment letters on the
2 concentration averaging guidance. Several state
3 agencies commented. However, the guidance hasn't been
4 revised in the draft SRP that will go out next week,
5 except for minor editorial changes. We'll consider
6 the comments we received to this point along with any
7 others we receive during the 60 day public comment
8 period. And, as I said before, we expect to issue the
9 draft SRP sometime next week and the final SRP at the
10 end of this year.

11 The purpose of the SRP. The SRP is
12 primarily intended to be an internal guidance document
13 that will be used by the staff during its reviews of
14 DOE waste determinations. It describes the types of
15 information that may be assessed by the staff during
16 its reviews and also provides review procedures. The
17 key objective really is to provide consistency,
18 consistency across different types of reviews and
19 across different technical reviewers, and we also view
20 the SRP as a very important knowledge transfer tool.

21 And, fortunately, the staff that has the
22 most experience in the reviews, Dr. Ridge, Dr. Esh and
23 Anna Bradford, were the primary authors of this
24 document and that is extremely important, given that
25 we have a relatively new and growing program that

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1 needs to bring new staff up to speed quickly while
2 also trying to accommodate aggressive schedules to
3 complete the reviews.

4 Schedules are important to DOE and certain
5 other stakeholders and, you know, we have been
6 targeting review times around 9 to 10 months for our
7 NDAA reviews compared to an historical precedent of
8 about 15 months, so that certainly is a challenge that
9 we're trying to meet. Although the SRP is not
10 explicitly meant for use by DOE, it certainly could be
11 used by the Department to understand what information
12 NRC is looking for and how we'll conduct our reviews.

13 The next several slides give an overview
14 of the outline of the SRP. The SRP begins with an
15 introduction to provide context to the rest of the
16 document. The introduction covers background
17 information, how to use the SRP, a brief historical
18 discussion including the evolution of the various
19 incidental waste criteria sets, as well as a
20 discussion of the NRC's role in waste determinations.

21 Chapter 1 discusses information about a
22 site, the surrounding area and the associated waste
23 management activities that a reviewer should evaluate
24 at the beginning of a waste determination review. The
25 purpose of this chapter is really to ensure that the

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1 reviewer establishes the proper context for the
2 detailed technical review that is to follow, and so to
3 help focus the review. General information includes
4 areas such as land use, meteorology and climatology,
5 geology, seismology, etcetera, that are relevant to
6 the review.

7 Site-specific system descriptions include
8 the systems being analyzed in the waste determination,
9 such as a tank farm or a waste treatment facility, as
10 well as any other systems or equipment that are
11 relevant. Subsequently, the SRP lists the four DOE
12 sites that may have incidental waste and the sources
13 of the incidental waste criteria. That is the NDAA
14 DOE Order 435.1 and the West Valley policy statement.

15 The SRP notes that reviewers should
16 consider any other relevant previously completed waste
17 determinations to ensure that the knowledge gained
18 from prior efforts is retained and, again, to help
19 ensure consistency across reviews. I did want to make
20 the point though. You know, certainly, there is a
21 difference between the reviews we conducted prior to
22 the NDAA in South Carolina and Idaho and the reviews
23 that we're now conducting under the NDAA.

24 You know, one key reason for that is we
25 have a monitoring role under the NDAA that is subject

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1 to judicial review. So, certainly, it's reasonable
2 that we might consider other things in our NDAA
3 reviews and perhaps consider some things more
4 thoroughly than we did in the prior reviews when we
5 were only operating in an advisory capacity to DOE.

6 Chapter 2. Chapter 2 discusses in detail
7 the different sets of incidental waste criteria and
8 provides a comparison of the criteria and house staff
9 should interpret and apply the criteria. For example,
10 NDAA refers to highly radioactive radionuclides while
11 DOE Order 435.1 and the West Valley policy statement
12 refer to key radionuclides. During our first review
13 under the NDAA, the saltstone review, staff noted,
14 believe, that highly radioactive radionuclides are
15 those that contribute most significantly to risk,
16 which is the same concept as key radionuclides.

17 So this section makes exactly that point
18 to ensure that reviewers have a common understanding
19 of terminology. And I will note that that was one of
20 ACNW's recommendations specifically on this issue of
21 highly radioactive radionuclides versus key
22 radionuclides.

23 Another example is removal of waste to the
24 maximum extent practical, as stated in the NDAA,
25 versus the maximum extent technically and economically

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1 practical, as stated in Order 435.1 and the West
2 Valley policy statement. In this instance there is a
3 slight nuance in terminology and the section seeks to
4 clarify that for the reviewer.

5 Chapter 2 also discusses review of the
6 first criterion of the NDAA, which is that the waste
7 does not require permanent isolation in a deep
8 geologic repository for spent fuel or high level
9 waste. The review procedures for this criterion are
10 consistent with how it was approached in the saltstone
11 review.

12 And, finally, the chapter discusses at a
13 very high level removal of radionuclides to the
14 maximum extent practical and then refers the reader to
15 Chapter 3 and also discusses at a high level the
16 performance objectives of 10 CFR 61 Subpart C and
17 refers the reader to Chapters 4 through 7. As I
18 mentioned earlier, each set of incidental waste
19 criteria contains a requirement that highly
20 radioactive or key radionuclides be removed to the
21 maximum extent practical.

22 Chapter 3 guides the reviewer through an
23 evaluation of this requirement, including assessing
24 the inventory of radionuclides in the waste,
25 identifying highly radioactive radionuclides, removal

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1 of those radionuclides, the cost-benefit analysis to
2 help evaluate whether additional waste removal or
3 treatment needs to be performed and evaluating the
4 concentration of the waste. In fact, this is where
5 the December concentration averaging guidance has been
6 incorporated at the end of this chapter, and
7 Christianne is going to discuss this in more detail.

8 Chapter 4 provides guidance for the review
9 of the performance assessment used by DOE to
10 demonstrate compliance with the performance objective
11 of 10 CFR 61.41, protection of the general public from
12 releases of radioactivity. Dave is going to go
13 through this chapter in some detail, so I won't
14 elaborate here. This slide shows the remainder of
15 Chapter 4. Chapter 5 addresses the evaluation of
16 intruder analyses and doses per the performance
17 objective in 10 CFR 61.42. Dave is also going to
18 touch on that area.

19 Chapter 6 addresses the performance
20 objective for protection of individuals during
21 operations in 10 CFR 61.43. This chapter guides the
22 staff's review to confirm that operation of the
23 facility will provide reasonable assurance that the
24 radiation protection standards in 10 CFR Part 20 will
25 be met, including exposures to both workers and

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1 members of the public.

2 In addition, 10 CFR 61.43 includes
3 requirements that every reasonable effort will be made
4 to maintain radiation exposures as low as reasonably
5 achievable or ALARA. We recognize DOE is self-
6 regulating with respect to its operational activities
7 and it uses regulations in 10 CFR Part 835,
8 occupational radiation protection, to set operational
9 dose limits for workers and members of the public and
10 to demonstrate ALARA.

11 In our prior reviews, DOE has shown that
12 their regulations in 10 CFR Part 835 are similar to
13 those found in Part 20 and are, therefore, just as
14 protective. And the SRP confirms that this is an
15 acceptable approach.

16 Chapter 7 addresses the last of the four
17 performance objectives, site stability. It focuses on
18 the stability of the proposed disposal site, including
19 the potential for erosion, flooding and other
20 disruptive processes. It also addresses stability of
21 the waste and the engineered features of a disposal
22 facility.

23 Chapter 8 addresses the review of DOE's
24 Quality Assurance Program as applied to the waste
25 determination. The primary purpose of this chapter is

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1 to verify that DOE has applied quality assurance
2 measures to its data collection, analyses, waste
3 determinations and performance assessments. However,
4 the level of review recognizes that we're not
5 regulating DOE and the primary objective is to ensure
6 that the information DOE provides to us is accurate.

7 Chapter 9 provides general guidance on
8 preparing requests for additional information and
9 preparing the final technical evaluation report.
10 Again, this is primarily for new staff who may be
11 developing these products for the first time.

12 Finally, Chapter 10. Chapter 10 discusses
13 our monitoring role under the NDAA. As the Committee
14 knows, we're required by the NDAA to monitor in
15 coordination with the state DOE's disposal actions to
16 assess compliance with the performance objectives in
17 10 CFR 61 Subpart C. This section is purposefully
18 written at a high level. We expect monitoring
19 activities to vary for individual waste
20 determinations, and so the details of our monitoring
21 approach will be provided in individual monitoring
22 plans.

23 In fact, we're currently working with DOE
24 in the State of South Carolina to develop our
25 monitoring approach for saltstone. Monitoring will be

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1 risk-informed and performance-based and will partially
2 depend on the findings of the technical evaluation
3 report.

4 For example, in the saltstone TER we
5 identified certain key assumptions, such as the
6 hydraulic conductivity of the waste form and the rate
7 of waste oxidation that needed to be monitored due to
8 their importance to that facility meeting the
9 performance objectives.

10 Key aspects of the staff's monitoring
11 activities are expected to include both on-site
12 observation, such as sample collection, and technical
13 review of environmental data, updates to the
14 performance assessment model, results of experiments,
15 etcetera. And, certainly, the scope of monitoring is
16 expected to change as waste management activities
17 proceed.

18 You know, again using the saltstone
19 example, you know, the early stage focus might be on
20 the characteristics of the feed to the salt waste
21 processing facility while later on, you know, once the
22 saltstone is in place, we might focus on, you know,
23 properties of the grouted waste form. So we do expect
24 the monitoring approach to change over time.

25 Finally, I would like to briefly discuss

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1 the incorporation of ACNW's recommendations in the
2 SRP. The staff appreciates ACNW's work in this area
3 and we carefully considered the recommendations
4 provided by the Committee in its December letter.

5 Upon reviewing the document, I think you will find
6 nearly all of the Committee's recommendations have
7 been addressed and, in fact, the discussions by
8 Christianne and Dave will touch on some of these areas
9 and I, in fact, touched on some of them as well when
10 I discussed the comparison of highly radioactive
11 radionuclides versus key radionuclides.

12 As I mentioned earlier, we would be happy
13 to come back at a later time to answer any questions
14 the Committee has on the SRP regarding the
15 incorporation of your recommendations or any other
16 area you would like to discuss. Guidance in the SRP
17 will help the staff provide risk-informed reviews of
18 waste determinations. It also provides flexibility to
19 allow for the fact that waste determinations require
20 a case-by-case evaluation.

21 However, as you have heard me discuss, a
22 key objective of the SRP is certainly to provide
23 consistency where appropriate, for example in defining
24 waste criteria and considering the results of prior
25 waste determination reviews. The SRP considers and

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1 references other NRC guidance and documents, such as
2 our guidance on performance assessment provided in
3 NUREG-1573 and the decommissioning guidance in NUREG-
4 1757.

5 To conclude my portion of the
6 presentation, I hope you enjoy reviewing the document.
7 It should be available next week and we're certainly
8 proud of the effort, and we thank the Committee for
9 its input. I will now turn things over to
10 Christianne.

11 DR. RIDGE: Good morning. I know you're
12 all aware, well-aware, of the various sets of criteria
13 that govern the waste determinations and Ryan touched
14 on earlier some of the slight differences in wording
15 and the SRP does clarify those, how we interpret those
16 differences. But, essentially, each set of criteria
17 contains a requirement that radionuclides, key
18 radionuclides, highly radioactive radionuclides, be
19 removed to the maximum extent practical.

20 And we cover, the SRP covers, four general
21 review areas, radionuclide inventories, selection of
22 highly radioactive radionuclides, selection of
23 radionuclide removal technologies and the practicality
24 of additional removal which often is addressed by DOE
25 as a cost-benefit analysis. I am going to in my

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1 following slides talk about each of these areas in a
2 little more detail, but first I want to make two
3 general points about radionuclide removal.

4 One is that waste determinations may be
5 submitted either before or after most of the removal
6 activities have taken place. So, for example, in the
7 saltstone review we reviewed a case in which most of
8 the treatment of the salt waste had yet to take place
9 and we were reviewing the plans. In another case for
10 the Savannah River Tanks 18 and 19 that we're looking
11 at now, most of that removal activity or all of that
12 removal activity has taken place.

13 And so that changes the tenor of the
14 review a little bit, because in one case we're looking
15 at activities that DOE considers to be complete. In
16 another case we're looking at plans for removal. But,
17 essentially, in either case we're judging what were
18 the criteria for stopping and would it be reasonable
19 to achieve more.

20 The other general point I wanted to make
21 was that removal of radionuclides refers both to
22 removal of waste -- we tend to focus on tanks, so it
23 can refer to removal of waste from the system, which
24 is to say removal of waste from tanks or from another
25 system, but it also could refer to selective removal

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1 of radionuclides from the waste.

2 So, for instance, in the saltstone review
3 we did, we were looking at DOE's plan to remove
4 radionuclides from the salt waste. So when we talk
5 about radionuclide removal, we mean both removal of
6 bulk, of the physical volume of waste from the system,
7 and also selective radionuclides from the waste that
8 will be left in place.

9 The first step of the review is to look at
10 the radionuclide inventory and this review also
11 supports the development of the source term that Dr.
12 Esh will be talking about as part of the performance
13 assessment and inadvertent intruder analyses. The SRP
14 directs the reviewer to look at the development of
15 inventory and expect that we'll be looking at both the
16 concentration of radionuclides in the waste and the
17 volumes of waste that will be left or that will be
18 disposed of, and both of these parts contribute
19 uncertainties.

20 So, for example, some sources of
21 concentration data can include samples that DOE has
22 taken for instance from tanks or process knowledge for
23 some radionuclides that can't be adequately sampled
24 for whatever reason or in a case where we're looking
25 at treatment to selectively remove radionuclides, for

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1 instance in the saltstone case, the concentrations,
2 the predicted concentrations, were based on treatment
3 efficiencies rather than samples because the sampling
4 hadn't taken place yet.

5 Potential sources for the volume include
6 mapping, visual mapping of waste heels, reel tape
7 readings, process knowledge. Again, in cases in which
8 the removal hasn't been accomplished, process
9 knowledge would be important and the amount of waste
10 you expect to remove and you expect to treat.

11 So, as I said, each of these contribute
12 uncertainties and the SRP directs the reviewer to
13 carefully review these uncertainties. For instance,
14 if data is based on sampling, we would be looking
15 primarily at analytic uncertainties. Also, sample
16 variability and whether the waste heterogeneity has
17 been adequately characterized. So we would be looking
18 at things like DOE sampling plans, where samples were
19 taken, how many samples were taken.

20 For other radionuclides in which
21 inventories are based on process knowledge, we would
22 be looking at whether or not there is -- the relative
23 completeness of knowledge of tank receipts would be
24 one source of information. And for treatment
25 processes, such as the salt waste treatment process we

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1 looked at at Savannah River site for saltstone, we
2 would look at uncertainty in the predicted treatment
3 efficiencies. And these are just some examples of
4 potential sources of information. Certainly, this
5 list is not exhaustive.

6 So after the reviewer looks at the
7 inventories, the SRP directs the reviewer to look at
8 the selection of highly radioactive radionuclides. As
9 Ryan stated, the NRC staff believes that highly
10 radioactive radionuclides are those that contribute
11 most significantly to risk to the public, workers and
12 the environment. And the review of the selection is
13 expected to include DOE's technical basis for which
14 radionuclides they included.

15 But because our definition is risk-
16 informed, we also would be looking at the results of
17 the performance assessment, inadvertent intruder
18 analyses, predicted doses to workers to make sure that
19 the expected risk drivers are on that list. That is
20 what we would essentially be looking for.

21 Now, the only thing I wanted to point out
22 is that we would expect that risk drivers in the
23 predicted case are included, but also we would expect
24 to look at sensitivity analyses so that if the system
25 doesn't perform as well as expected, if there are any

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1 radionuclides that emerge as risk drivers in that
2 case, that those also should be included on the list
3 and that is really the only nuance there in that
4 review.

5 After establishing the list of
6 radionuclides that need to be removed to the maximum
7 extent practical, the reviewer would look at the
8 technology, at DOE's technology selection, and there
9 are really two main review areas that the SRP covers.
10 The first is that we want to make sure that an
11 appropriate range of technologies should be evaluated.
12 So, for example, we would expect that the reviewer
13 would be aware of technologies that have been used at
14 various DOE sites and to try to evaluate whether any
15 of those would be applicable to the problem at hand.

16 And, again, the reviewer would want to
17 look at whether or not there was any opportunity to
18 selectively remove radionuclides from the waste in
19 addition to simply looking at whether or not there are
20 opportunities to reduce the volume of waste that is
21 going to be determined to be not high level waste or
22 waste incidental through processing.

23 So some factors that we would expect would
24 affect the choice of removal technologies would
25 include the expected effectiveness of the

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1 technologies, technological maturity, the schedule
2 impact of implementing different technologies,
3 implementation costs, worker safety impacts and
4 system-wide effects.

5 And an example of that might be the
6 impacts on waste storage space or chemical effects on
7 downstream systems. So the second review area would
8 really be looking more at the process that DOE chose,
9 that it used, sorry, the process that DOE used to
10 choose the technology selections after making sure
11 that a reasonable range of technologies were
12 evaluated.

13 So, as I said earlier, waste
14 determinations can be submitted either before or after
15 removal, DOE considers removal to be complete. And in
16 either case really, the reviewer needs to look at
17 DOE's basis for stopping removal activities. So in a
18 case in which DOE considers removal to be complete, we
19 would be looking at documentation for why removal was
20 stopped.

21 And I think Dr. Parker mentioned earlier
22 this morning in his briefing using a case in which DOE
23 maybe used a single technology until they determined
24 it was no longer effective. And then the question
25 would be, well, could any enhancements be made to that

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1 technology or was there another technology at hand
2 that could have been implemented. And those would be
3 the kinds of questions that we would be looking at to
4 determine if activities that DOE considers to be
5 complete, the basis for them being stopped.

6 In cases in which the activities have not
7 been completed in DOE's view, we would be looking at
8 DOE's criteria for determining when they will consider
9 them to be complete. So, essentially, when are we
10 going to know that we have stopped and we can move on?

11 Often this decision is determined based on
12 the expected cost and benefits of additional
13 radionuclide removal. So in either case often DOE
14 would be -- we would expect DOE to be looking at,
15 based on our previous experience with them, to be
16 saying, well, we expect that we can reduce risk by
17 this much by continuing removal and it would cause
18 this cost or this worker impact or this schedule
19 impact.

20 And the only real point we make in the SRP
21 with respect to this evaluation of costs and benefits
22 that might be somewhat -- well, at any rate, an
23 additional point that we make is that the
24 uncertainties in the dose estimates, once you're
25 quantifying costs and benefits, do impact what the

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1 benefits of additional removal will be.

2 So, for instance, if later in the review
3 of the performance assessment through an iterative
4 process it becomes clear that the predicted doses
5 might not be what were expected, then that might
6 change the balance of benefits that you would expect
7 from additional removal. Essentially, if there is a
8 lot more risk there, there is a lot more to be gained
9 from reducing it.

10 So to just be a little bit more specific
11 than I was on the last slide, we do expect to look at
12 the cost and benefits of additional removal and some
13 of the factors that we would expect to look at are
14 risk considerations, and that would include potential
15 risk to workers and risk to the public, as well as
16 other considerations, the economic costs of additional
17 removal, potential schedule impacts and other system
18 impacts that I mentioned earlier.

19 And, if possible, we direct the reviewer
20 to try to quantify the cost and benefits in terms of
21 economic cost and expected risk just to facilitate
22 comparison. Well, we understand that, for instance,
23 the schedule impacts are part of the evaluation of
24 practicality. We would try to tie those schedule
25 impacts into the economic costs just to facilitate

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1 comparison among different alternatives.

2 And so that's all I'm going to say this
3 morning in this presentation about radionuclide
4 removal. Dr. Esh is going to talk about concentration
5 limits and then continue with information on the
6 performance assessment and inadvertent intruder
7 analysis review.

8 DR. ESH: Thank you. I am David Esh. I'm
9 pleased to be here today. I'm going to cover a number
10 of topics with you. Maybe if we had this to do over,
11 we would have reordered things and put the slowest
12 talker first instead of last, but you'll have to
13 suffer through.

14 Concentration limits. What we have
15 basically done in the SRP is we provided the same
16 concentration averaging guidance as we published in
17 the Federal Register notice in December 2005. The
18 reason why we did this, and I guess this might prevent
19 you from writing David Esh is a slacker on the notes
20 of your slides, but we basically had an issue of we
21 knew we were going to put it in the SRP. We received
22 comments already, but we didn't want to put a new
23 version in there and then be receiving comments on the
24 new version, potentially comments on the old version,
25 people confused.

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1 We didn't want to partially modify the
2 concentration averaging guidance and people say, hey,
3 you didn't address my comment, but you did address
4 their comments. And so we thought this was the best
5 approach. We have been considering those comments.
6 We're working on how to resolve them. There is quite
7 a range of opinions on the subject and we'll do what
8 we think is right as an agency, but probably not
9 everybody is going to end up being happy where that
10 guidance ends up.

11 But the reason why we have this in the SRP
12 is that some of the criteria require you to determine
13 the class of the waste. For instance, under the NDAA
14 the class of the waste is needed to see whether you're
15 kicked into another phase where NRC also evaluates the
16 disposal plans or interacts with DOE on the disposal
17 plans.

18 What is found in this guidance is
19 basically the same principles that are in 10 CFR Part
20 61 and in the 1995 branch technical position. We feel
21 like we have been faithful to the principles, but the
22 language may be somewhat different and, certainly,
23 it's tailored to the problems that are most pertinent
24 to these DOE sites instead of the commercial low level
25 waste disposal.

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1 Now, I will move on to performance
2 assessment. Performance assessment we expect is going
3 to be the analysis approach that is used to
4 demonstrate compliance with 10 CFR 61.41. Of course,
5 it's not a requirement to use performance assessment,
6 but it's typically what is done and it's what we
7 expect in the future.

8 The main challenge that we had in writing
9 the SRP for the performance assessment review
10 procedures was to balance this issue of allowing for
11 flexibility while still ensuring uniformity, and they
12 seem to be kind of counter to one another, but
13 hopefully in a few slides here I will try to convince
14 you how we did that.

15 This performance assessment review though
16 that is if someone is using the SRP that they will
17 perform, it will be a risk-informed and performance-
18 based review. So it is not a prescriptive approach.
19 It does not provide a prescriptive checklist that you
20 must walk through and if everybody were to follow
21 through that checklist, they will end up at the same
22 point.

23 It allows for flexibility for site-to-site
24 and problem-to-problem and that is very important,
25 because people tend to think about just tanks and tank

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1 residuals. And there is enough variability from site-
2 to-site in just that problem, let alone it also has to
3 address removal of waste from the tanks, potentially
4 treatment of that waste, disposal in different
5 configurations and potential removal and disposal of
6 large pieces of equipment or that sort of thing from
7 the tanks.

8 So it covers a pretty broad spectrum, but
9 there are some very complicated and detailed technical
10 problems within that broad spectrum. So it was a
11 challenge to write it, but hopefully you will agree
12 that we did a decent job with it.

13 Now, the overview of this performance
14 assessment section in the document is it provides both
15 some generic technical review procedures to ensure
16 this comprehensiveness, and then it also provides
17 technical review procedures, specific technical review
18 procedures, and we think that this approach will allow
19 us to achieve this comprehensiveness while still
20 maintaining the flexibility.

21 Using the specific technical review
22 procedures, the reviewer would ensure that the key
23 elements are evaluated in each area and I will show
24 you that in a second. Using the comprehensive
25 technical review procedures, it would ensure that

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1 every reviewer covers all the main elements that need
2 to be covered to ensure the technical sufficiency of
3 the information.

4 We have provided review procedures for
5 evaluating uncertainty and sensitivity analysis
6 explicitly, because we feel that's kind of an
7 important issue for these problems. And model support
8 and uncertainty are emphasized throughout this whole
9 section of the SRP, and that is because those issues
10 are pretty pervasive to the problem we think and,
11 therefore, they are pervasive in the review plan also.

12 I knew somebody wouldn't get this clicker
13 and, evidently, it's me. The main elements, and this
14 is just basically a summary of the outline of the
15 document, it starts off with scenario selection and
16 receptor groups and then we have these generic review
17 procedures followed by the specific ones. The
18 specific ones are broken up into main, basically sub-
19 models of the performance assessment ranging from
20 climate and infiltration down through radionuclide
21 transport and then to the biosphere part of the
22 calculation.

23 We also provide review methods or review
24 procedures on the computational models and computer
25 codes, how to evaluate those. As I stated earlier,

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1 uncertainty and sensitivity analysis. We have a
2 section on how to evaluate the model results and in
3 that section, that is where we talk about defining
4 barrier contributions and performing enough analysis
5 of your problem to understand how it's working.

6 And that is a key element in order for us
7 to do a risk-informed review, is that enough
8 information is provided or that we generate to
9 understand how the problem is working. And then there
10 is also a part two, the ALARA analysis.

11 So under scenario selection and receptors,
12 this is where we address the period of performance
13 which is consistent with NUREG-1573 and institutional
14 controls, which can be important for these problems.
15 Those can define or help define the scenarios that you
16 need to evaluate and also the receptors that you
17 should evaluate.

18 The review procedures for scenario
19 identification are provided and this, e.g., I think is
20 a little confusing. What it is attempting to say is
21 that the scenario identification should consider the
22 release and exposure pathways and the physical form of
23 the released waste, not that that is an example of a
24 scenario identification. So just to clarify that a
25 little bit.

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1 The identification of the relevant
2 features and processes. So you have a new reviewer
3 that picks up the SRP and they are assigned to review
4 a determination that comes in from Hanford, and they
5 will look at the documents given by DOE and any
6 external documents, but they have to try to think.
7 You have to try to help them determine whether the
8 information submitted is complete or not.

9 So how do you know that you have looked at
10 all the necessary features of that site, features,
11 events and processes that may influence the decision.
12 It's a challenge especially for a junior reviewer and
13 it's a challenge especially for even a senior reviewer
14 at a complicated site. Many times we learn what is
15 important by observation and some of these
16 observations may be somewhat limited.

17 But what we have done in the SRP is we
18 have provided a generic list of what we think the
19 major ones are that would apply to most sites. That
20 doesn't mean that it's a comprehensive list, that it
21 contains every feature, event or process that would
22 apply at a site. That is where the flexibility aspect
23 comes in, but we think enough is there that it's going
24 to provide a comprehensive evaluation from site-to-
25 site.

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1 There is also a lot of variability from
2 site-to-site and problem-to-problem, as I mentioned
3 earlier. So if we were attempting to provide a
4 comprehensive FEP list, which is done in some
5 programs, I don't see that there would be a large
6 amount of value to that in this arena, mainly because
7 a lot of the aspects of the sites are already --
8 you're not selecting a disposal site.

9 These sites are already determined where
10 the material is. So you are evaluating it and they
11 have been evaluated for a number of decades. So
12 surprises can happen, but I don't think a generic FEP
13 list is the way to make sure that you capture all
14 those surprises.

15 Receptor characteristics. We basically
16 advocate in the SRP that those are defined for the
17 public and intruder receptors using a buffer zone
18 concept, and that is basically that the intruders are
19 the receptors that perform actions inside the buffer
20 zone.

21 The public receptor is outside the buffer
22 zone. The public receptor is the site boundary may be
23 at a further location than the buffer zone while there
24 is active institutional control. So when the active
25 institutional controls end, then the buffer zone

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1 distance defines where the public receptor is and that
2 distance is on the order of hundreds of meters or at
3 the point of maximum exposure.

4 Now, for our general or generic technical
5 review procedures, we took an approach similar to what
6 was taken in the Yucca Mountain Review Plan, but a
7 little bit different. We have basically these five
8 areas, system description, data sufficiency, data
9 uncertainty, model uncertainty and model support, and
10 they provide review procedures on those topics that
11 every reviewer will use.

12 So we may have a specialist in hydrology
13 that is only going to look at hydrology, but we want
14 to ensure that he covers uncertainty just the same as
15 our geochemist does when they are looking at
16 geochemistry aspects. So instead of writing
17 essentially the same text over and exchanging the word
18 hydrology with geochemistry, we wrote a generic review
19 procedure that each one is directed to use and it will
20 ensure the comprehensiveness of the review on,
21 basically, these technical areas.

22 And then, as I said, these would be
23 applied to all the different models or sub-models or
24 areas of the performance assessment, and this I think
25 greatly reduces the redundancy in the document. So

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1 contrary to popular belief, we do believe in being as
2 efficient as possible and we generally don't believe
3 that huge review plans of hundreds and hundreds of
4 pages benefit anyone. So we try to be as concise as
5 possible, but having as much detail as we need to make
6 sure the reviews are performed consistently and
7 everything is technically accurate.

8 The specific technical procedures then are
9 provided for each area of the performance assessment,
10 say the source term or infiltration or what have you,
11 and they have specific elements that the reviewer in
12 that area should focus on. They are generally
13 developed based on our past experience with waste
14 determination reviews or other reviews of similar
15 problems.

16 So, for instance, in the area of
17 infiltration we may have a review procedure for
18 somebody to consider abandoned boreholes and those
19 sorts of things on infiltration estimates or if the
20 site has been disturbed in the area where the
21 infiltration measurements are or infiltration is being
22 estimated, how does the disturbed area estimates --
23 how would they compare to ambient area estimates,
24 those sorts of things.

25 An example here for the source term and

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1 near-field release is we provide specific technical
2 review procedures in this area on inventory, the
3 degradation release of the waste forms, the source
4 term models, chemical, environment and gaseous
5 releases.

6 In addition to these two main areas that
7 apply to all these, basically, models in the
8 performance assessment, we provide review procedures
9 on more higher level topics pertinent to performance
10 assessment, including whether it's a deterministic or
11 probabilistic approach that is used. We provide a
12 separate section on uncertainty and sensitivity
13 analysis. And, as I stated earlier, an important part
14 of the review is evaluating the model results and
15 defining the contributions of the barrier as a natural
16 system.

17 If you want to do a risk-informed approach
18 and reduce the number of questions you may receive and
19 the time it takes to do the review, if you can clearly
20 present what are the most important parts of the
21 problem and that you have adequate basis for those
22 parts of the problem, that will get you to your
23 endpoint as fast as possible. So we think this is a
24 very important part of the SRP and then in our
25 application or execution of the SRP.

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1 We emphasize throughout, as I stated, the
2 need for adequate model support. It's a very
3 important part of the review. We believe that the
4 amount of moral support should be commensurate with
5 the risk significance of the model. So if you can
6 demonstrate that your results are not strongly
7 dependent on that model, then you don't need to
8 justify how accurate you are with that part of the
9 problem.

10 But if your results are strongly dependent
11 on the model, then you better have a lot of support to
12 justify that that is the way that the system will
13 work. And we recognize that the model support may
14 entail multiple lines of evidence and also that
15 traditional validation may not be possible for these
16 types of problems. This slide and the two slides that
17 follow are all directly in line with the previous ACNW
18 recommendations that we received.

19 The SRP provides guidance. I think I
20 skipped one. No, sorry, I was wrong. This slide, No.
21 28 and 29 and 30, are the three that address your
22 recommendations. I was one behind. The SRP provides
23 guidance on evaluating the long-term performance of
24 cementitious materials. We provide common degradation
25 mechanisms that the reviewer could consider, and we

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1 also address the coupling of processes when evaluating
2 long-term performance.

3 Now, switching gears to the inadvertent
4 intrusion analysis. I only have one slide on this.
5 The intruders may be defined based on site-specific
6 considerations. An important element is that
7 technical basis is needed for the performance of
8 intruder protection systems, so it's not a guarantee
9 that you can see I have an intruder barrier.
10 Therefore, I evaluate my intruders in one manner.

11 We consider that you could have a variety
12 of scenarios though dependent on site-specific
13 conditions and intruder protection systems ranging
14 from the common ones like the resident and
15 agricultural scenario to maybe a less intrusive and
16 less common one of a recreational type scenario. And
17 we have a box there for other if something else comes
18 up that we didn't think of.

19 We emphasize in this area that site-
20 specific parameters should be used when available.
21 People have a tendency to default to Part 61, Draft
22 EIS, because an intruder analysis was done there, but
23 that was an intruder analysis for a generic type
24 problem for a regulatory -- for just defining some
25 things in the regulation basically. So if you have

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1 site-specific information that is more pertinent and
2 can change things in either direction, favorable or
3 unfavorable, you should probably be using your site-
4 specific information when available.

5 That's all I had. Conclusions. Ryan, do
6 you want me to do these, you can do them?

7 MR. WHITED: Sure.

8 DR. ESH: The SRP will facilitate risk-
9 informed performance-based reviews of the waste
10 determinations. This is what we hope. The review
11 areas take into account existing NRC guidance, our
12 experience, previous reviews and ACNW recommendations.
13 And we look forward to your comments on the draft SRP.

14 We, in our process of developing it, have
15 had our newer staff, our more junior staff, look at it
16 and say, okay, would this help you to perform the
17 review, but we're also interested in the comments from
18 your group who may have a knowledge level that is
19 different than them or external groups, because
20 ultimately this SRP is not intended to just be a
21 document and then people go off and do things the way
22 they have always done them.

23 We want it to be very useful and to help
24 ensure the consistency of the reviews, so would like
25 feedback on whether it looks like it's going to

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1 achieve that goal or not. It is a challenge though,
2 I would note. As I tried to emphasize, it's a real
3 challenge to put all the specific elements in there
4 that you think may be needed for different sites and
5 different problems without being overly prescriptive
6 and overly redundant.

7 CHAIRMAN RYAN: You never get them all.

8 DR. ESH: You never get them all anyway.
9 You keep extending it and chopping off the tail and
10 the tail gets longer and you have more and you chop
11 that off. You never get there. So that's all we have
12 and we'll appreciate any questions you may have.

13 VICE CHAIRMAN CROFF: Jim?

14 MEMBER CLARKE: Thank you. I have a
15 couple of questions that come under the general
16 heading of how clean is clean, and I wonder if we
17 could go to slide 13.

18 The practicality of additional removal
19 would be determined on a cost-benefit analysis and the
20 benefit would be framed in terms of the risk
21 reduction. So it has been my experience with removals
22 and treatment, especially that you hit a point of
23 diminishing returns where the cost for incremental
24 risk reduction is just overwhelming, and that could
25 arguably be a place to stop.

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1 Is there a threshold on the risk where
2 there is a place to stop independent of the cost?

3 DR. RIDGE: Well, I think, certainly our
4 decisions on risk of course are, but the primary
5 consideration --

6 MEMBER CLARKE: You may have a legal piece
7 that I'm not sensitive to, but is the thinking that
8 you continue to remove as long as the costs are
9 commensurate with the risk reduction, is that --

10 DR. RIDGE: Well, I mean, there are a
11 couple of things I want to say. Of course, the
12 performance objectives are primary and the primary
13 risk considerations are looked at in terms of the
14 performance objectives. But I believe that one of the
15 ACNW's recommendations in this area was to look at
16 risk in terms of other risks on the site and that is
17 actually what the SRP -- the SRP does address it in
18 that way, is consistent with that recommendation.

19 MEMBER CLARKE: Okay. That's a good
20 answer, that came up this morning when we were talking
21 to the Academy about whether or not they would be able
22 to address that. In other words, this risk is not a
23 tank risk in a vacuum. It does consider the
24 surroundings to the extent that that can be done.

25 The other question I have is it looks like

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1 you have a single criteria here, but I'm suspecting
2 that that's not totally accurate. In other words, in
3 addition to cost-benefit are you considering short-
4 term versus long-term, risk to the public versus risk
5 to workers?

6 DR. RIDGE: Yes. As I think we tried to
7 touch on later in the presentation that maybe bears
8 some clarification that the removal to the extent
9 practical allows for consideration of a number of
10 factors, you know, short-term risks, worker risks,
11 longer term risk to the public, schedule impact and we
12 would consider all of those. To the extent that they
13 can be quantified, that facilitates comparison and
14 analysis, but of course there are considerations that
15 aren't quantifiable and we do recognize that.

16 MEMBER CLARKE: I just wanted to ask this.
17 CERCLA, which is another law and another situation,
18 does have a set of nine criteria, some of which I
19 would encourage you not to consider, but they have a
20 set of what they call balancing criteria that looks at
21 short-term versus long-term technical feasibility cost
22 and risk to workers, risk to the public, risk to the
23 environment.

24 And so while your slide looked like you
25 were really making this decision on a cost per risk

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1 reduction basis, I just wanted to probe you a little
2 bit on that and see if there were other factors
3 involved. Thank you.

4 VICE CHAIRMAN CROFF: Ruth?

5 MEMBER WEINER: I don't mean to be beating
6 a dead horse, but the use of the term "highly
7 radioactive" still troubles me because that does have
8 a specific meaning. Radioactivity has a specific
9 meaning. It is measured in curies or becquerels. And
10 since you are going to use this term, I would strongly
11 encourage you to have right up front an explanation
12 that this is not the usual use of the term. This is
13 not the common use of the term, that you are using it
14 in a specific way to mean key radionuclides.

15 The reason I make such a strong point of
16 this is I think this is a real point of confusion, in
17 particular for people who really have only a shaky
18 understanding of what radioactivity is. And if you're
19 concerned about public, communication with the public,
20 the last thing you want to do is make your own
21 definition for a commonly used term.

22 So the only way that I can see, since you
23 have made the decision clearly, is to have an up front
24 explanation that in this document highly radioactive
25 means important to risk and does not necessarily mean

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1 the most radioactive radionuclide, the one with the
2 largest, highest activity, if you will.

3 Beyond that, when you say removal, do you
4 give any consideration as to where this material is
5 going to be removed to or is that beyond the scope of
6 this? Somebody is going to raise the question, I'm
7 sure.

8 DR. RIDGE: The SRP doesn't specifically
9 address where the material is removed to. Now, each
10 problem is site-specific. So in the case of
11 saltstone, the removal would have meant radionuclides
12 that were taken out of the salt waste and then would
13 not be disposed of at saltstone. But, I mean, in most
14 cases I think that removal implies the waste that is
15 then going to be vitrified, has been the case so far,
16 but is going to be not the waste that we're then
17 thinking about.

18 So it does somewhat leave the scope, I
19 think, is what I'm trying to say, and the SRP does not
20 address where the radionuclides that are removed then
21 go.

22 MEMBER WEINER: It may never be a problem.
23 It's just a question, it seems to me, that for a large
24 and complex site somebody is going to ask that.
25 Somebody is going to say, okay, what are you going to

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1 do with this stuff then?

2 On the question of screening features,
3 events and processes, does the applicant do that?
4 Does NRC do it? Does NRC repeat the applicant's
5 screening?

6 DR. ESH: Yes, that's a good question. To
7 date, we haven't ever in any of our waste
8 determinations had or received a formal screening
9 process that was done to develop, say, the performance
10 assessment. It's always the performance assessment is
11 basically done and it explains why it represents the
12 site and the features and the analysis is presented.

13 So considering the history at a lot of
14 these sites and the fact that most of the performance
15 assessment activities would not be starting from
16 square one, I think it is reasonable to not have a
17 formal screening process, but you still want to do
18 something to ensure completeness of all the
19 significant features.

20 And the way that we did that is to provide
21 a list of what we thought the major features and
22 processes would be that would be included, so that if
23 Christianne is reviewing a site, she can step through
24 that list and if all those features are there, she has
25 a reasonably high degree of confidence that nothing

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1 major has been missed in the analysis or isn't part of
2 the analysis without asking somebody like Dick Codell,
3 who works in high level waste for 30 years, and he
4 says oh, yes, there was a site in Tennessee that had
5 this problem and I think it applies here, you know.

6 We, as an agency, lose our institutional
7 knowledge and so something like this is the best that
8 we can do. The best that we can do to help to retain
9 that comprehensiveness, I guess, or completeness of
10 the analysis.

11 MEMBER WEINER: Following up on Jim's
12 question for a moment, the risks, the various risks
13 as I'm sure you recognize are going to have to be
14 balanced off against each other, because they don't
15 all work the same way. You don't always decrease
16 public risk and decrease worker risk at the same time.
17 So are you planning some general format, guidance,
18 quantitative guidance for that or are you just going
19 to do it on a case-by-case basis?

20 DR. RIDGE: Well, the SRP does direct the
21 reviewer to look at the risks and costs in terms of
22 other DOE activities at the site.

23 MEMBER WEINER: Okay.

24 DR. RIDGE: And at this point, neither --
25 the SRP does not recommend a quantitative -- you know,

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1 workers should get this dose, you know. There is this
2 multiplicative factor between workers. I mean, we
3 actually in the SRP specifically note that there are
4 certain types of quantitative comparisons that aren't
5 appropriate.

6 MEMBER WEINER: Yes.

7 DR. RIDGE: But I think it does direct the
8 reviewer to look at them in terms of other activities
9 at the site.

10 MEMBER WEINER: Yes, that's a very good
11 point. Finally --

12 VICE CHAIRMAN CROFF: Ruth?

13 MEMBER WEINER: Yes?

14 VICE CHAIRMAN CROFF: Just a second. I
15 think Scott had wanted to weigh in on an earlier
16 question.

17 MEMBER WEINER: Oh, I'm sorry.

18 DR. FLANDERS: I just wanted to add to the
19 response to a couple of your questions. One of them,
20 the use of the term highly radioactive radionuclides,
21 we agree clearly with your views on that. The reason
22 why that term is in is that's the term that's actually
23 in the legislation that's directing us, our activities
24 under the NDAA. And as Christianne mentioned earlier,
25 one of the things that we felt equally important was

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1 to define what we mean by highly radioactive
2 radionuclides in the context of these reviews.

3 And we talked about how we compare those
4 to or used a similar definition that we use when we
5 talk about key radionuclides in the past. So the
6 reason why we -- that term is in here is because it's
7 in the legislation that gave us this responsibility,
8 but we do define it up front early in the document.

9 MEMBER WEINER: Thank you.

10 DR. FLANDERS: In terms of how it is used.

11 MEMBER WEINER: Thanks for that
12 explanation. That's very helpful and I recognize we
13 have discussed this question before.

14 DR. FLANDERS: The second issue is where
15 the waste is going. I think Christianne answered well
16 that the majority of the waste that is removed from
17 these tanks will be vitrified and disposed of in a
18 high level waste repository. And then in some cases,
19 such as the saltstone review, which we have completed,
20 where there is some waste that's actually going to be
21 disposed of on-site, and for that waste it's going to
22 be disposed of on-site, that's within the scope of the
23 review.

24 DR. ESH: Ruth, I think your reason for
25 commenting on that is the analysis of the cumulative

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1 impacts of the decision though, right?

2 MEMBER WEINER: Yes, yes.

3 DR. ESH: You vitrify it, but you still
4 have to ship it and dispose of it somewhere else and
5 there is impacts associated with that shipping and
6 disposal. Yes, we don't evaluate the shipping and
7 disposal impacts in our evaluation, but I believe it
8 would be part of DOE's environmental impact statement
9 type analysis.

10 DR. FLANDERS: That is a part of their
11 impact statement. The DOE folks can talk to it as it
12 relates to the sites, but also, you know, as you know
13 for the environmental impacts for Yucca Mountain, the
14 waste associated for disposal from these tanks are
15 also factored into that analysis in terms of
16 transport.

17 MEMBER WEINER: Thank you. I'll let it go
18 at that. Thank you.

19 CHAIRMAN RYAN: First, let me compliment
20 you on taking on a tough technical challenge and
21 really doing a great job of getting it organized to
22 this point. We really look forward to the document.
23 I think you have certainly organized your thoughts and
24 approached it in a really technically sound manner and
25 that's coming through loud and clear to me, so I

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1 appreciate that and everybody's part.

2 Second is SRPs are used by two groups.
3 First, it's used by the staff to review and typically
4 it's used by the user or the applicant to organize
5 their materials in a way that flows into the review
6 process. And maybe I'm anticipating what you've
7 already -- you know, what will be in the document.
8 We'll see in a few weeks. But examples. Do you have
9 enough examples where you can kind of guide folks
10 through this process of thinking about range of values
11 and, you know, how to risk inform and then you can say
12 okay, we don't need to worry about this process,
13 because it's a lower priority or doesn't contribute to
14 those kind of things? How is that going to work?

15 DR. ESH: Yes, I think that we have
16 provided a lot of, or at least some, additional text
17 to explain some issues and talk about different things
18 like probabilistic analysis and various issues like that.
19 But we probably don't have a lot of examples in there,
20 you know. This site provided data on infiltration
21 that was derived. As an example. This site provided
22 data on infiltration that was derived from estimates
23 based on measurements of moisture content or something
24 and they got a range of this.

25 How would the reviewer evaluate that and

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1 determine whether it was acceptable or appropriate?
2 I don't think we have like that level of detail in
3 there. And the primary reason is there is too much
4 variation. You have very arid sites to humid sites.
5 You have waste removed from tanks, disposed of at the
6 land surface almost under engineer barriers. You have
7 waste disposed of deeper without maybe the same types
8 of barriers.

9 CHAIRMAN RYAN: So it's literally and
10 figuratively all over the map?

11 DR. ESH: Yes. We could certainly provide
12 some examples about evaluating or representing like on
13 certain data, things like that, providing -- okay.
14 You have four sample measurements and how would you
15 assign a probability distribution to that? We could
16 provide that sort of thing, I think, but to provide
17 the level of detail beyond that as -- in terms of
18 examples, it would be extremely difficult.

19 It was very difficult. What you will see
20 was very difficult to produce. So I --

21 CHAIRMAN RYAN: I actually appreciate
22 that. That's a fair response and don't offer any
23 criticism at all. Thinking ahead then, is there a way
24 to, you know, as you go through determinations how are
25 you going to capture that sort of build the body and

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1 knowledge for everybody's benefit? Will there be case
2 reports? You know, and then I'm thinking ahead and
3 this is just thinking out loud that, you know, it
4 would be kind of interesting if you did a
5 determination, although there were really five things
6 we struggled with, to maybe write up those five things
7 as part of a case study or, you know, and maybe even
8 have appendixes or via 2s, 3s and 4s and you get them
9 to add to the review plan.

10 That helps you with your body and
11 knowledge and your knowledge management question. I
12 just throw that out as a thought, but you're going to
13 be carving a lot of new ground, I'm going to guess.

14 DR. ESH: Well, I think --

15 CHAIRMAN RYAN: In all of this.

16 DR. ESH: -- it's a definite challenge,
17 because as we perform reviews, we'll have different
18 groups that will perform the reviews. Now, albeit,
19 we're not a huge group of people, so we have weekly
20 meetings where we communicate with each other.

21 CHAIRMAN RYAN: Yes.

22 DR. ESH: And people talk with each other.
23 I don't think we have anywhere near a dysfunctional
24 unit that we're not communicating well on the
25 different types of reviews that people are doing. But

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1 we also have a challenge with -- in the SRP, it says
2 you should consider previous reviews. Well, what does
3 that mean? Does that mean I should go back and review
4 five TERs before I start doing my review on this new
5 site?

6 I don't think it means that, but you
7 should certainly be aware of the main issues that were
8 covered in those previous reports, probably by looking
9 at the assumptions and recommendations and those sorts
10 of things and also communicating. You know, if you
11 see something when you are using the SRP and I worry
12 how I'm going to review it, I feel like I don't have
13 enough detail in the SRP, I certainly need to talk to
14 the people that have also faced that problem and say
15 okay, what did you do on this site or the other site.

16 It's much more a significant problem say
17 in performing a decommissioning review, where they are
18 so much more frequent and there are so many of them
19 then in incidental waste where we're dealing with four
20 sites and, you know, handfuls of reviews each year.
21 So I think this goes a big step in ensuring our
22 consistency, but it's not the only step. I think
23 there are other things that we have to do like some of
24 the things you talked about to try to achieve that.

25 CHAIRMAN RYAN: Yes.

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1 DR. FLANDERS: If I could just add to
2 Dave's answer? One of the objectives that we have in
3 our operating plan is required to do a lessons learned
4 report. And while we haven't done one yet and we
5 haven't scoped it out, your comments are well-taken.
6 Maybe we'll take that under consideration in terms of
7 how we factor that into our system.

8 CHAIRMAN RYAN: And again, maybe we can
9 put more shape to them when we get the plan and review
10 it in detail and then, you know, maybe some specific
11 things will drop out. But like you said in the
12 beginning, it sounds like you have really taken on a
13 tough task in a short period of time and applied your
14 collective talents to it well. So we'll look forward
15 to the document. Thanks.

16 DR. ESH: Thank you.

17 CHAIRMAN RYAN: Bill?

18 MEMBER HINZE: A single question, minor
19 natured, for clarification and this also relates to
20 this slide 13. In the selection of radionuclide
21 removal technologies, are you requiring DOE to look on
22 a cost-benefit basis comparative nature of comparison
23 of different technologies on a cost-benefit basis?
24 How are you -- how do you arrive at a decision on
25 that?

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1 DR. RIDGE: Well, I think some of the
2 factors that we would expect DOE to look at and again
3 the SRP, of course, isn't requiring DOE to do
4 anything, but some of the factors that we would expect
5 DOE to look at and that we would expect to look at, I
6 think, we tried to touch on maybe on slide 18, we
7 would look at their process for choosing technologies,
8 the expected effectiveness.

9 I mean, in some cases, DOE produces
10 reports that say well, we expect this technology might
11 cost this much and they have produced information like
12 that in the past, but may only remove waste to this
13 certain level and this other technology, we expect it
14 could do a little better, but it might have these
15 other tradeoffs as far as downstream impact or
16 uncertainty in how well it could do. Technological
17 maturity, of course, is a big consideration.

18 I'm not sure I'm getting to the heart of
19 your question, but I think the answer is yes, we --

20 MEMBER HINZE: You are anticipating having
21 a comparison, so that you can review it adequately.

22 DR. RIDGE: We are and that is based on
23 our experience in the past. In prior cases, DOE has
24 looked at and provided to us information on the
25 technologies they have used and what they believe the

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1 pros and cons were of various technologies and why
2 they chose the technologies they did.

3 MEMBER HINZE: Thank you.

4 VICE CHAIRMAN CROFF: I've got questions,
5 I think, in a couple of areas, but maybe a little bit
6 more general. First, on monitoring, I have heard
7 monitoring mentioned in this context in the last
8 couple of days a few times and most of the time, it's
9 followed immediately by this statement "Monitoring is
10 subject to judicial review." And I'm not sure exactly
11 what that means or how it makes it different from the
12 other aspects of this waste determination business.
13 Can somebody explain why that's important or what it
14 means? Don't all leap up at once.

15 DR. FLANDERS: I think we're looking for
16 OGC.

17 MR. WHITED: Allen, we're looking for OGC
18 to help us answer this question. I'll attempt to and
19 I don't pretend to be an attorney at all, so you'll
20 get that kind of an answer. You get what you pay for.

21 DR. ESH: Maybe we should ask DOE's
22 consultant. No.

23 DR. FLANDERS: The term "judicial review,"
24 is specific to the monitoring aspect of it and what we
25 take away from that is that while, of course, we have

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1 to fulfill our responsibilities under the legislation
2 as required, but that the monitoring activities if we
3 were not to carry it out, one could come back and
4 challenge whether or not the agency is fully
5 fulfilling it's responsibilities and it would be
6 subject to a legal process.

7 Now, the details of that, we would have to
8 get back to you with OGC and give you a full
9 interpretation of what that means, but it's written
10 into the legislation and the aspect of judicial review
11 is pointed directly at our monitoring
12 responsibilities. So that's how we are interpreting
13 it as a lay-person, but I'm sure you see it as a much
14 more sophisticated analysis of what it means.

15 VICE CHAIRMAN CROFF: Okay. Does that
16 extend to the point -- let's presume there is -- I'm
17 picking the saltstone vaults, they are closed and
18 monitoring is going on and results are coming out
19 every year in a report or something and somebody could
20 challenge the NRC or the state, because they think you
21 should have acted on the basis of the monitoring
22 results.

23 DR. FLANDERS: Right. I think they could
24 challenge. Yes, they could challenge as to whether or
25 not we're evaluating that information and how we are

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1 assuring ourselves that they are, in fact, meeting the
2 performance objectives.

3 VICE CHAIRMAN CROFF: Okay. The second
4 thing on monitoring, it was mentioned that the NRC and
5 state and I guess DOE were working on a plan, I guess,
6 for saltstone. When might that plan be revealed, be
7 available for review?

8 MR. THAGGARD: Yes, we don't have a
9 definite schedule on that right now. Oh, I'm sorry.
10 I'm Mark Thaggard with the NRC. We don't have a
11 definite plan on that right now. I think DOE has got
12 an aggressive schedule to try to get their plan to
13 develop some time this summer and, obviously, we can't
14 develop our implementation plan until we figure out
15 exactly what they are doing. So we don't have an
16 exact schedule on that yet.

17 VICE CHAIRMAN CROFF: Thanks. A somewhat
18 different line. After you have completed one recent
19 review on the saltstone and I think you got a couple
20 of others in progress and you've got a draft SRP
21 that's essentially done, except for the printing, I
22 guess. After having gone through all of that and done
23 a lot of thinking and soul searching, what seems to be
24 bubbling up to the top as the most critical technical
25 issues that you're seeing, the most critical

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1 assumptions or data parameters or models or whatever
2 that seem to be revealed by all this?

3 DR. ESH: I think I can answer that.
4 There is always a high degree of uncertainty with
5 inventory estimates for a variety of reasons, so
6 that's one of the important factors.

7 VICE CHAIRMAN CROFF: Even the residual
8 inventory? I mean, like the heel?

9 DR. ESH: Right through, yes.

10 VICE CHAIRMAN CROFF: Okay.

11 DR. ESH: Yes. But probably more
12 importantly is the long-term performance of the
13 cementitious materials or other engineer barriers put
14 in place to help achieve 61.41 performance objective.
15 That seems to be a driver. Now, granted, that as a
16 driver or say saltstone may not be a driver at a site
17 like Idaho that has a deep vadose zone, a deep
18 unsaturated zone and some of the parts of the natural
19 system may play a more important role the geologic,
20 the natural system may play a more important role at
21 a site like Idaho.

22 VICE CHAIRMAN CROFF: Yes.

23 DR. ESH: But at a humid site like
24 Savannah River, it's almost all engineering source
25 term inventory-related as the driver of the problem.

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1 At West Valley we don't have any waste determinations
2 under review right now, but we anticipate them in the
3 future. It will be somewhat similar to Savannah River
4 with the added complexity of erosional processes, I
5 believe. And Hanford and Idaho are pretty similar.
6 They are both semi-arid sites and have similar
7 problems there.

8 But the quantity and concentration of
9 material at Hanford might be significantly larger than
10 at Idaho. So they might have to have a higher
11 reliance on engineered systems there, even though it
12 is a semi-arid site than say Idaho would, who tends to
13 have a fairly small quantity of waste on a relative
14 basis with the other DOE sites.

15 VICE CHAIRMAN CROFF: To what extent is
16 making these maximum extent practical decisions of an
17 issue? I can -- in sort of looking at what's going
18 on, it would seem that -- well, the tradeoffs
19 themselves are complicated to make, but just keeping
20 track of the status of technology. In other words,
21 has DOE considered all the right things or is there
22 something else out there for retrieval or solvent
23 extraction or whatever? Just keeping track of all
24 that with somewhat of an independent eye on it would
25 seem to be a real challenge.

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1 DR. RIDGE: It is a challenge. And I
2 think Mike Ryan mentioned earlier that some of the
3 staff working on this, Dr. Esh and myself included,
4 went to a recent seminar or workshop rather than DOE
5 was involved with regarding different technologies
6 that are available to remove waste from tanks. And
7 so, I mean, we do try to keep up with things that are
8 available. Obviously, we would be -- you know, our
9 major source of information is different technologies
10 that are being used at different sites, but we do try
11 to look at other reports.

12 I mean, in the past, NAS has done reports
13 on technologies that DOE has used and their selection
14 process for technologies, we try to keep aware of
15 things like that. But I agree with you, keeping track
16 of what is being done at different sites and what
17 maybe has not been implemented yet, but could be if
18 some work were put into it, also is a challenge.

19 VICE CHAIRMAN CROFF: Okay. Thanks.
20 Dave?

21 MR. KOCHER: Yes, mostly I want to second
22 Mike Ryan's comments. Most of what I have heard here
23 is very encouraging to me. You've certainly thought
24 about what's important and you have certainly thought
25 about what are reasonable ways to go about evaluating

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1 what's important in these analyses. And of course,
2 the devil will be in the details and you'll learn a
3 lot more as you get real cases.

4 But I'm very, very encouraged and I found
5 myself relating some of what was presented here to
6 some of the discussions we had over the last two days
7 about newly generated low level waste. And I sort of
8 came to the conclusion that there is not a lot of
9 overlap between some of these problems. We spent a
10 lot of time discussing issues of concentration
11 averaging and why maybe -- well, I put forth just a
12 thought and I don't know if anybody agreed that maybe
13 some of the approaches to concentration averaging in
14 the branch technical position were really not quite
15 right when it comes down to intrusion analyses into a
16 disposal facility.

17 But I think that problem goes away. It
18 certainly goes away with saltstone, because you have
19 this humongous homogenous waste form and you're
20 starting with liquid waste, so those kind of issues go
21 away. When it comes to complying with the performance
22 objective for inadvertent intruders, you know, I have
23 seen your evaluation of the saltstone work and it's
24 clear for perfectly understandable reasons that you
25 have to kind of do a tap dance here, because you don't

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1 really have them numbered in Part 61 that you work to,
2 so you have to have some kind of surrogate.

3 And that's fine, I mean, you need a
4 target. But by the same token, I guess, I would
5 encourage you to look at compliance as not just
6 meeting a number. There are subjective qualitative
7 issues about probabilities that something will happen
8 or whether this scenario is reasonable that can kind
9 of factor into a decision process here about whether
10 this has been met. And I'm sure you're aware of this,
11 because those issues will -- it's all in how you
12 define the scenarios and that's really the key.

13 A question I had was about ALARA, because
14 I have never really quite -- even though I've done an
15 ALARA analysis for a PA, I have really -- I'm not
16 entirely comfortable with how this works when it comes
17 to, you know, long-term highly uncertain projections
18 and you are kind of stuck with fixed disposal
19 technologies and making incremental changes of those
20 technologies don't really make sense.

21 And I wonder if, in a minute or less, you
22 could give me some idea of how you look at this ALARA
23 problem in these evaluations?

24 DR. RIDGE: Well, ALARA in these
25 evaluations is covered in part by the criterion to, I

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1 suppose, this requirement that radionuclides be
2 removed to the maximum extent practical. That's a big
3 part of the ALARA analysis. The thought being that if
4 you remove them from the system, not only have you
5 removed the potential dose, but you have removed a lot
6 of the uncertainty.

7 It's no longer a question of how well the
8 stabilization is going to work, but they are out of
9 the system and so this requirement that the
10 radionuclides, the key radionuclides or highly
11 radioactive radionuclides be removed to the maximum
12 extent practical, does go a long way towards the ALARA
13 argument.

14 I think that we do regard ALARA as being
15 slightly broader in that it does also include have you
16 stabilized the waste to the -- a reasonable extent?
17 If you have -- you know, removing it is one step of
18 reducing the dose and reducing the uncertainty, but
19 stabilizing the waste where it is, also, of course, is
20 an important part of that. So it's a little broader.

21 MR. KOCHER: That's a really helpful
22 answer, because, of course, my mindset was evaluating
23 ALARA with respect to putting waste in a saltstone
24 vault. And I see your point and you might well say
25 that if their base case analysis for saltstone

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1 disposal shows a maximum dose to the public of a tenth
2 of a millirem, you probably would declare victory and
3 go home, assuming that the other parts of the waste
4 removal had been satisfied. Now, I appreciate that
5 answer.

6 DR. ESH: I think at one time Christianne
7 gave, to me I think, an example that illustrates the
8 concept that I think is pretty pertinent here. Say
9 you have a heel on the bottom of the tank and you're
10 going to put grout in it to help immobilize it, well,
11 the -- you may in your modeling analyze it one way and
12 say it's not highly important whether I mix that grout
13 with the waste or not to achieve the performance
14 objectives.

15 But the reality is if that waste is better
16 mixed with your constituents that you're putting in or
17 your cementitious material, you are probably going to
18 limit its release better than if it's a pancake type
19 system with a layer of waste and a layer of cement on
20 top of it. So from an ALARA perspective, if it's not
21 costly to try to facilitate that mixing, you should
22 probably facilitate that mixing, even if in your
23 analysis you've shown that the dose is .4 millirem if
24 I do mix it or, you know, .4 and .3.

25 So there may be things like that that we

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1 believe would be ALARA type considerations that are
2 also then outside of waste removal. There are other
3 things you can do to try to reduce your potential
4 future impacts.

5 MR. KOCHER: One other quick comment, if
6 I might. I was -- I'll be looking forward to seeing
7 more details and discussions about sensitivity
8 uncertainly analysis. And I think I saw the right,
9 for me, words on the slides that what you are really
10 concerned about here is uncertainty with respect to,
11 you know, robustness of meeting the performance
12 objectives and not necessarily uncertainty in the
13 actual outcome of disposal.

14 MR. HAMDAN: I have a question for David.

15 CHAIRMAN RYAN: Microphone.

16 MR. HAMDAN: Oh. Have you mentioned the
17 importance of model support and how it is emphasized
18 in the SRP? What kinds of examples are you thinking
19 about or did you think about? And will you include
20 these examples in the SRP or not?

21 DR. ESH: I think we think of multiple
22 types of model support ranging from experiments to
23 determine parameter values, field scale, larger scale
24 experiments to address uncertainties with the scaling
25 and other processes, experience at analogous sites or

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1 systems. You are trying to develop a cap for one of
2 these types of incidental waste problems. You may be
3 able to look at the design and performance of caps for
4 CERCLA sites or uranium mill tailing sites and learn
5 from their experience.

6 Natural analogs when available. I guess
7 there are a smattering of things. I think we talk
8 about all of those, but, of course, we don't go into
9 detail of providing for an engineered cap. Here are
10 the types of analogs that people have used and how
11 would you determine whether the information supplied
12 by DOE appropriately demonstrates from an analog
13 perspective the performance of their system?

14 We don't provide that level of detail in
15 the SRP and I think that's appropriate, because there
16 are -- I can stress it again. There are a number of
17 permutations of things you can get into. And so if
18 you try to provide the detail, the document would
19 expand and expand and expand and it would get to the
20 point where I don't think it would be very useful for
21 people. It wouldn't be useful for our staff and it
22 wouldn't be useful for DOE and it wouldn't be useful
23 say for the Committee here.

24 MR. HAMDAN: You probably never could
25 provide everything anyway. Thanks.

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1 VICE CHAIRMAN CROFF: Thank you. Any
2 other questions from staff? Okay. Seeing none, I
3 would very much like to thank the three of you for a
4 very informative briefing and for the rest of the NMSS
5 folks that showed up and helped with the questions.
6 Before we adjourn, I would like to talk a little bit
7 about why we got everybody here in terms of the
8 Committee and NMSS, I guess, a little bit about letter
9 writing.

10 I'm going to suggest to the Committee we
11 don't see a letter out of the Academy briefing. It's
12 for our background information and commenting on an
13 existing report doesn't seem to be very useful. I'm
14 going to suspect we're going to want to write a letter
15 on the draft SRP, but we don't have that yet, of
16 course, and it will be -- we will get it, let's say,
17 approximately, June 1 with a two month window for
18 comments, which means we're probably going to want to
19 work on a letter, have a draft letter coming into the
20 July meeting.

21 We can't do anything in June, because the
22 meeting is so soon. So I think what we're going to
23 have to do, my suggestion is, we'll take what we have
24 heard this morning, the background, general
25 background, we'll get copies of the draft SRP,

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1 presumably next week. It will be posted on a website,
2 right?

3 MR. WHITED: Yes.

4 VICE CHAIRMAN CROFF: And I'll scheme a
5 little bit on a schedule and send out some emails when
6 I would like to get your input, allow time to read the
7 thing, but, you know, some time, you know, later in
8 June get your input and we'll start working on a
9 letter off-line, if you will, and try to get something
10 into shape. I think that's what we're left with. Is
11 that --

12 CHAIRMAN RYAN: Sounds great.

13 VICE CHAIRMAN CROFF: Okay. With that,
14 five minutes early, thank you very much.

15 CHAIRMAN RYAN: Just so we finish up and
16 we can cover the topic now that we've got all the
17 right folks, I mean a lot of the right folks here, and
18 I think we clearly will write a letter on the low
19 level waste working group in the last two days and so
20 we've checked that box. We'll be taking that up at
21 our next meeting in the July time frame. So we'll
22 have a draft and be up and running with that as well.

23 VICE CHAIRMAN CROFF: Okay. Back at 1:30.

24 CHAIRMAN RYAN: We're adjourned until
25 1:30.

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1 (Whereupon, the meeting was recessed at
2 12:12 p.m. to reconvene at 1:34 p.m. this same day.)
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1 A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

2 1:34 p.m.

3 CHAIRMAN RYAN: Don, we're pleased to have
4 you here to talk to us about the recent International
5 Commission on Radiological Protection Draft Report
6 entitled "The Scope of Radiological Protection
7 Regulations." We're looking forward to your insights
8 and hopefully you can illuminate what was readily
9 apparent for us. So take it away.

10 DR. COOL: Thank you. Okay. Good
11 afternoon. Glad to be with you. For the record, I'm
12 Donald Cool. Am I ringing? It feels like I'm just
13 ringing.

14 CHAIRMAN RYAN: Well, I would move it down
15 maybe.

16 DR. COOL: See, I was being coached over
17 here about how I had to get it up very close to my
18 throat in order to be able to be heard.

19 CHAIRMAN RYAN: It's actually a little
20 better right now for us.

21 DR. COOL: Okay. Is that better?

22 CHAIRMAN RYAN: Yes.

23 DR. COOL: All right. Donald Cool, I'm
24 the Senior Advisor for Radiation Safety, an
25 international liaison, from the Office of Nuclear

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1 Material Safety and Safeguards. Before I get started,
2 I would note that working on these activities, I work
3 closely with Dr. Vince Holahan in the Office of
4 Research.

5 I was thinking about saying that Vince
6 regrets being here today, although I'm afraid I would
7 have to disappoint you. He has chosen to be at the
8 NRC's annual awards ceremony, since he is receiving
9 this afternoon the Honorary Meritorious Service Award.

10 CHAIRMAN RYAN: Well, let's add to our
11 record that we congratulate Vince on the recognition
12 of his excellent work on such a prestigious award.
13 Thank you.

14 DR. COOL: So with that, what I am going
15 to try and do in the next few minutes for you is give
16 you a brief overview of the ICRP draft report. I'll
17 give you some of the staff's preliminary views. We
18 are in the process of developing and assembling the
19 comments that we will provide to ICRP shortly and then
20 open it up for discussion with the Committee.

21 So to start with, an overview of the
22 report and done without any bias or perception, I
23 hope. The intent of the report as given by the ICRP
24 to provide some recommended criteria for defining
25 radiation exposure situations that can and need to be

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1 subject to radiologic protection regulations and
2 provide some description of the concepts of exclusion,
3 exemption and their application.

4 Basically, what that boils down to is
5 trying to provide some information on what, as you
6 know, can be a rather torturous line along the edges
7 of what you are trying to control, what you're not
8 trying to control and why at any given moment you
9 might be applying those controls. This is also
10 somewhat important for ICRP in that the
11 recommendations that the ICRP would produce or NCRP or
12 others would also have to have some definition of what
13 they would apply to or don't apply to.

14 This particular report is intended as one
15 of the foundational building blocks that the ICRP has
16 been working on in support of their revised
17 recommendations. There are actually two types of
18 documents as ICRP now defines them. A couple of
19 foundation documents, as they call them, which were
20 the ones specifically related to the biology and some
21 of the modeling, which may, in fact, end up to be
22 appendices of the recommendations themselves and then
23 this series of building blocks which were intended to
24 elaborate some particular concept or provide some
25 additional information.

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1 The report with an introduction and some
2 discussion of the Commission's regulations versus the
3 construction of the regulatory approach by a
4 particular country, discussion of what they refer to
5 as dichotomous control, discussions of exclusion,
6 exemption, an extended discussion of how those
7 concepts might apply in some specific situation and
8 then some further discussion on defining the regular
9 radiological scope of the regulations.

10 The first major concept is that of
11 exclusion. That being those situations that need not
12 be covered by radiological protection legislation,
13 because they are considered to be unamenable to
14 control by any means. As in there is nothing that can
15 be reasonably done or done at all, depending upon how
16 you look at it, to provide any control to a situation
17 and thus that there would be no reason to apply any
18 regulations or other kinds of criteria to those
19 particular kinds of exposures.

20 They do have some specific recommendations
21 on those. This is similar to that which the NRC has
22 in Part 20, for example, suggesting excluding things
23 like cosmic radiation, radionuclides of natural origin
24 in the human body and, as they put it, anything else
25 that the legislator or the regulator decides he wants

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1 to exclude, which is a fairly large caveat of things
2 that you could pour into the hole or not pour into the
3 hole, depending upon how they would look at it.

4 Note that in NRC's regulatory construct,
5 there are several things that are excluded in terms of
6 items that Part 20 regulations would not apply to,
7 that's what the concepts of exclusion are. So this is
8 not at all inconsistent with the way that the NRC, the
9 United States and most other countries, the IAEA basic
10 safety standards have been constructed.

11 The second concept that of exemption. The
12 process of identifying a situation that might be
13 within the scope of what you are trying to control,
14 but that can be released or the process of not
15 applying regulations or perhaps taking away some of
16 the requirements from a particular application, as in
17 deciding not to do the full situation that you might
18 otherwise apply to an exposure.

19 Again, this is a very typical sort of
20 thing that we see in most regulations, including the
21 various NRC regulations, not only Part 20, but 30, 40,
22 50, 70, 72, 76, etcetera, all have certain things that
23 are exempt where the full set of requirements is not
24 applied for a variety of reasons.

25 Now, some of these are the typical things

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1 and some of these you will start to sense a bit of
2 controversy around. The first one, devices, admitting
3 the adventitious radiation as in those very soft level
4 x-rays, the cathode ray tube, like our -- maybe not
5 these, but the older fashions in our TVs and some of
6 those sorts of things produce.

7 The second one, which they recommend and
8 we'll come back to this in a little bit when we get
9 the staff views, recommending activity concentration
10 smaller than those specified in FAO or WHO, that's the
11 Food and Agricultural Organization of the United
12 Nations and the World Health Organization, WHO, for
13 food substance and drinking water and for non-edible
14 commodities as was laid out in IAEA in the recent
15 Safety Guide RSG-1.7, which was on exemption exclusion
16 clearance.

17 Now, in addition to that, there are quite
18 a lot of numerical values that float around into
19 various portions of this draft ICRP report dealing
20 with artificial nuclides and radionuclides and they
21 draw upon a fairly large base of information,
22 particularly generated by the International Atomic
23 Energy Agency, but also by the European Commission and
24 others around what has been slowly coming together as
25 at least somewhat of a consensus for situations in

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1 which most people are not applying regulatory controls
2 or providing clearance.

3 So about a becquerel per kilogram for
4 alpha emitters I have put our units in. Sometimes I
5 am successful being, one, bilingual, sometimes I am
6 not. Hopefully, I have done my math correctly in
7 these cases. 10 becquerels per kilogram for some of
8 the beta gamma emitters. You'll notice that's a very
9 interesting number there. And then for natural
10 radionuclides 1,000 becquerels, this is head of chain,
11 for the natural occurring chains and 10,000 becquerels
12 Potassium-40 in the body.

13 In addition to which, they have a caveat
14 associated with some of the constructs around building
15 materials and some additional constraints might be
16 necessary because of the kinds of exposure scenarios
17 that you might have, depending on your situations. So
18 I said most all of this has been derived from the
19 modeling work that was done by the EC and the IAEA.
20 I would note that it is very similar to and
21 numerically quite equivalent.

22 No, not exactly by the numerics, but they
23 all fall within a very small space with the modeling
24 work that the NRC did in the Office of Research in
25 developing the underlying basis when we were working

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1 on the proposals for control of solid material. So
2 numerically, there are some consistencies. There are
3 some places where these are inconsistent.

4 And what they have done, ICRP has tried to
5 generalize these numbers to provide sort of a global
6 overview that doesn't mimic exactly what some of those
7 individual documents would have had in it, but what
8 they do is perhaps representing something that could
9 be considered as a consensus.

10 Now, I'll change my hat and put on my
11 regular NRC staff hat and talk about some of the
12 staff's preliminary views. Unfortunately, Mr.
13 Chairman, I am not convinced I'm going to be able to
14 shed a great deal of light, as you would have hoped,
15 in being able to explain this document. But I will
16 tell you it is complex. It is difficult to interpret
17 and it is confusing.

18 We spent a great deal of time reading it,
19 to look at it, we looked at it and it doesn't help us
20 a great deal either. It's, in fact, not at all clear
21 to us that in the United States or another country
22 which had a well-developed regulatory regime this
23 would be of any particular use. In fact, it poses
24 some conflicts with those of us that have fairly well-
25 established numbers in a variety of situations. We'll

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1 talk about that in a moment.

2 And unfortunately, if I was in a country
3 somewhere who was attempting to reach out for
4 information on how I should construct a good logical,
5 consistent, coherent risk-informed regulatory basis,
6 this would not be the document that I would suggest
7 that they go and use. It covers a wide range of
8 topics, the only similarity of which is that they all
9 in one way or another deal with what you might or
10 might not control.

11 But having said that, because it attempts
12 to cover the waterfront of all of those boundaries,
13 you find huge discrepancies in the kinds of things
14 that are being discussed and you find huge
15 discrepancies in the rationales that are used and the
16 numerical values that result from it.

17 I would note that the report in paragraph
18 119, if you want to go and try and find it sometime,
19 the report itself notes that "The regulatory concepts
20 and terminology are difficult enough without making
21 them unnecessarily torturous and complex." The staff
22 is not convinced that they haven't succeeded in making
23 it perhaps a bit more torturous and complex.

24 Amongst other things, there is at least
25 one reference to concerns about how some things are

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1 not readily translatable into other languages.
2 Unfortunately, a lot of the Latin in the report itself
3 is also very difficult to translate into other
4 languages. And for anyone who isn't perhaps of the
5 Latin/Roman sort of legislative structure, the
6 regulatory structures themselves may not necessarily
7 even translate.

8 So let's look at a few slightly more
9 specific comments. First, we do not believe that the
10 draft, in fact, resolves important issues. For
11 example, an issue that we ran into as we were
12 preparing a proposal for the Commission on the control
13 of solid material, the numerical values at which you
14 could clear or exempt from further controls, both
15 materials are not the same as the criteria that are
16 used for deciding when you might need to placard
17 something for transportation.

18 Thus, we discovered that you could clear
19 the material and you could not drive it off the site
20 without placarding the truck. This report,
21 unfortunately, notes that that is true and proceeds to
22 assume that you should just use whichever criteria are
23 available, as in it does not provide any path forward
24 towards trying to resolve that particular issue. That
25 is one example.

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1 A second example, which may be a lot more
2 difficult, is that fact that natural materials and
3 artificial materials are treated differently. This
4 report, in fact, pretty much assumes that people view
5 them differently. Therefore, they are treated
6 differently. Therefore, they should be treated
7 differently which is, of course, one way of thinking
8 about it, but leads us to some of the rather
9 interesting discontinuities in the numerical values
10 that are used and, therefore, the risks that are posed
11 at different points for when you would apply or not
12 apply regulatory controls.

13 Secondly, the numerical values that are in
14 this report do not correspond to a number of the U.S.
15 controls in existence today. For example, the U.S.
16 drinking water standards are about five times more
17 restrictive than what is suggested here for at least
18 some of the radionuclides. The Codex Alimentarius
19 values, these are the WHO and FAO values, were
20 actually derived, if you might recall, for what to do
21 following a nuclear accident.

22 A lot of these were worked on and revised
23 following Chernobyl, because there was a great deal of
24 concern about foodstuffs, use of foodstuffs, what will
25 be acceptable for someone to consume post-accident.

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1 Amongst other things, in that model is an assumption
2 that only part of the foodstuffs that are consumed are
3 actually contaminated, so that you're not getting your
4 entire diet out of these materials.

5 So the NRC staff has a bit of a difficulty
6 understanding why these could now be suggested as
7 being an automatic exemption, perfectly suitable any
8 time, any place under any circumstance. The
9 underlying logic just doesn't quite seem to fit
10 together for us.

11 It also notes that a number of the generic
12 exemption levels that they have provided here for a
13 lot of these radionuclides exceed the screening
14 criteria, the Memorandum of Understanding criteria,
15 for which the NRC and the EPA have agreed we will
16 consult in decommissioning 5 pico curies per gram
17 radium.

18 Now, I suppose that there would be two
19 ways to look at it, attempting to be fair, which maybe
20 we are being too restrictive on where we think we have
21 to consult with each other, but certainly these values
22 don't comport with what you might expect to be a
23 universally agreed upon situation where one would need
24 to think no further upon the particular subject and,
25 therefore, exempt it without any further

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1 consideration.

2 On top of that, if we stand back a few
3 paces, the discussion in this report is apparently
4 inconsistent or seems to be inconsistent with the
5 ICRP's philosophy, as we understand they are moving
6 forward, of establishing a constraint for any
7 particular exposure situation and then applying
8 optimization.

9 Now, in the current set of ICRP
10 recommendations, Publication 60, which was not
11 essentially any different from what was in ICRP 26
12 which underlies our Part 20, you have a situation
13 where you establish an orderly construct. But it's
14 all focused on practices. In other words things that
15 you have control over. And then there was this thing
16 called interventions, what you do if there is an
17 emergency or otherwise, for which an entirely
18 different radiation protection regime seemed to apply.

19 With the recommendations that ICRP is
20 working on, witness the draft that was out almost two
21 years ago now, in the summer of 2004, the ICRP has
22 started moving towards a regulatory regime where
23 everything can be fitted into the same framework.
24 Namely, that for any particular source you establish
25 a constraint, a boundary at which you want to take

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1 some control action for the exposures from that
2 source. You then apply optimization to try and find
3 the optimum level of protection for that particular
4 situation.

5 In addition to that, you have individual
6 dose limits because you want to make sure that any
7 particular individual does not exceed some acceptable
8 level of dose. Unfortunately, it's very difficult to
9 understand how this building block report on the scope
10 of regulatory regulations fits in with that kind of
11 approach, because a number of these numeric values
12 don't seem to fit the model of a constraint. Surely
13 they don't mean for you to optimize below when they
14 are assuming that you just get rid of it.

15 On the other hand, we have heard talks by
16 Lars Eric Holm recently which say that all of the
17 documents that have come out on all of the numeric
18 values over the last 10 years should all be viewed as
19 constraints. Again, there is some discontinuity which
20 we simply cannot resolve and, therefore, we expect to
21 comment to them that this is an area which needs to be
22 reconciled within the ICRP family of documents, not
23 obvious to us even in which direction you might want
24 to go.

25 A couple of more egregious examples is the

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1 exemption intervention levels. For the life of me I
2 can't quite figure out how you exempt yourself from
3 deciding if you're going to intervene in a situation,
4 because the whole first step in deciding that you have
5 got an accident is deciding whether you want to do
6 something. And if you exempt yourself from the
7 decision of wanting to do something, I'm not quite
8 sure where you are in this decision making process,
9 personally.

10 The second might be an example of patient
11 release. For the most part, this report does not deal
12 with medical at all, but there is one very interesting
13 discussion which basically is focused on patient
14 release noting that patients are released with a
15 considerable quantity of radioactive material
16 potentially on board and they are walking around and
17 they are exempted from any further controls.

18 It goes on to strongly suggest, in fact,
19 that regulators might wish to reexamine that issue.
20 We do not believe that is necessary. And, in fact, we
21 seriously wonder if, in fact, this particular report
22 takes in that word right there, since it seems to have
23 missed the whole question of other medical treatment,
24 care giver support and a variety of other things which
25 the last we knew all fitted under those social and

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1 economic conditions that are part of the definition of
2 optimization.

3 So there are some situations here which do
4 not seem to align and which could potentially serve as
5 something that would cause us a bit of difficulty. So
6 what is the next step in the process? This was
7 released for public comment on their website.
8 Comments are due by, I believe it's June 19th. The
9 staff is preparing some comments. What I have given
10 you are just sort of some of the high points.

11 We have several pages of more detailed
12 comments underneath that, and that is without
13 attempting to do anything like nitpicking various and
14 sundry editorial remarks and expellings and otherwise.
15 It didn't seem, in fact, to the NRC staff at this
16 point that comments at such a level were even
17 worthwhile, given the fundamental nature of some of
18 our issues.

19 Of more import is the fact that ICRP
20 expects to put out its revised draft recommendations,
21 this would be round two of public comment, soon. Now,
22 Lars Eric Holm a couple of months ago talking with the
23 NCRP was saying late May, early June. Underneath that
24 was a nice little email from Jack Valentin, who is the
25 secretary of ICRP, which admitted that that pretty

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1 much had to do with the degree of speed with which
2 some of the homework that was assigned at the Madrid
3 ICRP meeting was actually finished off.

4 But the expectation is that within the
5 next few weeks that a report will be available on
6 their website and will be available for public
7 comment. This would be an update of the report upon
8 which we spent a great deal of time reviewing two
9 years ago and the staff expects, told the Commission
10 that we expect to review that report.

11 And, in fact, in that case, because it's
12 the recommendations themselves, the staff will take
13 those comments, provide them to the Commission for the
14 Commission's agreement before providing them to the
15 ICRP.

16 CHAIRMAN RYAN: Just for clarification,
17 this latter report is the revision of the one we
18 offered a letter on a couple of years ago.

19 DR. COOL: Correct.

20 CHAIRMAN RYAN: And this current report,
21 you are preparing separate comments, that what are the
22 due dates for the separate comments on this current
23 report we're talking about today?

24 DR. COOL: This report, comments are due
25 by June 19th.

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1 CHAIRMAN RYAN: June 19th.

2 DR. COOL: So fairly shortly.

3 Unfortunately, none of these comments will come in and
4 they will not have been able to look at it before
5 whatever portions of this might appear in the revised
6 recommendations will actually be out for public
7 comment.

8 CHAIRMAN RYAN: It's a bit schizophrenic
9 that they try to develop two documents that
10 interrelate simultaneously.

11 DR. COOL: Yes.

12 CHAIRMAN RYAN: Okay.

13 DR. COOL: We have made that observation
14 at least once before, as I recall, Mr. Chairman.

15 CHAIRMAN RYAN: Yes.

16 DR. COOL: This is in part because the
17 ICRP, as it has continued its revision process,
18 realized that there were several other places where it
19 probably should have had some supporting documents
20 beyond just what it was drafting in the
21 recommendations. So there were a series of reports,
22 the foundation documents, that were available last
23 year. We met with you at that time and went over a
24 number of those documents.

25 Several of those are now moving towards

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1 being finalized and into the ICRP's publication
2 system, and I expect to be reflected in this revised
3 draft of the recommendations that will be released in
4 a few weeks.

5 But in addition to this, there was this
6 report on scope and there is a document related to
7 medical exposure which we have not yet seen, but which
8 we understand will also be available for public
9 comment this summer. They may be available in
10 parallel. I don't have a specific date associated
11 with those at this time.

12 So we still have a bit of out of cycle
13 associated with some of the documents and comments, so
14 we may be in a situation. It's too soon to tell. We
15 may be in a situation where some of the observations
16 that we're making here will also end up having to be
17 observations that might be made for the
18 recommendations draft themselves when we start to
19 prepare our comments on this.

20 And I want to be very clear about where we
21 are procedurally. On this report, the scope of
22 radiological protection recommendations, the staff is
23 developing comments and the staff intends to make
24 those comments to ICRP.

25 We will provide that information to the

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1 Commission, but we will not be asking the Commission
2 to approve those comments just as we did not go to the
3 Commission and ask them to approve each of the
4 comments on the foundation documents last year. We do
5 plan to go to the Commission for Commission approval,
6 so they are Commission level comments, when we comment
7 on the recommendations that will be coming out this
8 summer.

9 And the other thing I would just note for
10 your advanced planning and calendar, we have been
11 working closely with the Nuclear Energy Agency based
12 in Paris to have a workshop on the ICRP
13 recommendations here in the United States. We expect
14 it to be here in Rockville, although the contract with
15 the hotel hasn't actually been signed yet, I
16 understand. It will be August 28th and 29th of 2006
17 and it will be on the revised draft recommendations,
18 because we expect by that point they will have been
19 out. We will have had an opportunity to review them
20 and have a discussion.

21 We are expecting that it will be not just
22 a United States workshop. We have invitations out
23 that have been accepted in Canada and in Mexico. We
24 expect to have multiple panels, including regulatory
25 viewpoints, industry viewpoints, some public

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1 organizations and non-Governmental organizations, some
2 of the medical folks. A variety of people are going
3 to be asked to participate and be part of various
4 panels on that discussion, and we look forward to that
5 helping us trying to understand and help the ICRP as
6 they move forward with their draft recommendations.

7 And with that, Mr. Chairman, I will close
8 my presentation and entertain any questions that you
9 might have. Thank you very much.

10 CHAIRMAN RYAN: Okay. Great. Thanks,
11 Don, we appreciate your insights. The good news is I
12 think we share your frustration and lack of clarity on
13 the document. You know, I read it one afternoon for
14 the first time and then I said, well, I need to read
15 this first thing in the morning and it wasn't any
16 better. So I read it at night. That wasn't any
17 better either.

18 But I took note of a few things about the
19 document. One is this is not a committee product of
20 any kind through ICRP. It has Roger Clarke, who is
21 the last chair of ICRP, John Cooper, who I don't know,
22 Able Gonzalez, who is a coordinator, Ches Mason and
23 Anthony Wrixon, kind of a broad spectrum of people.

24 DR. COOL: Yes. This was, in essence, a
25 task group of the main Commission.

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1 CHAIRMAN RYAN: Of the main Commission.

2 DR. COOL: The majority of the writing, as
3 I understand it, was by Able Gonzalez. John Cooper is
4 a senior official in what was NRPB, now the
5 Radiological Protection Division.

6 CHAIRMAN RYAN: Right.

7 DR. COOL: In the United Kingdom. He is
8 the vice chair of ICRP Committee 4. Ches Mason and
9 Tony Wrixon are both staff individuals in the
10 International Atomic Energy Agency.

11 CHAIRMAN RYAN: Got you. Well, thanks,
12 that's helpful. I then read in the abstract the
13 following sentences. "The report recommends criteria
14 of a universal and generic nature for defining
15 radiation exposure situations that can and need to be
16 subject to radiologic protection regulations and those
17 that cannot or need not."

18 Further, the report notes, that's my
19 words, and it says "It is suggested that the relevant
20 legislation should specifically define those
21 situations that should be covered by the legislation
22 because they can be controlled, and those that may be
23 excluded from legislation because they cannot be
24 controlled by any reasonable means."

25 I guess what I'm struggling with is the

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1 ICRP now taking on the role of political advisor for
2 a Government structure? I really don't see why this
3 sort of argument makes any sense or is even in the
4 purview or the charter of the ICRP. It is certainly
5 not based in science.

6 I then went on to the end of the document.
7 You know, being a teacher, I usually read the first
8 paragraph and the last paragraph of a document handed
9 in for class, and I found out that this has suffered
10 from what students suffer from, which is theme drift.

11 The concluding reflections now talk about
12 whether the legislative principles of de minimis non
13 curat lex or exclusion or de minimum non curat praetor
14 or exemption are used to give legal effect to the
15 various components and recommendations in this report
16 depends on national regulatory and legal practice.

17 Well, you know, how do we get from A to B?
18 And then in the middle are all the problems on
19 numerical values relative to U.S. practice. So, you
20 know, I then started seeing, well, I need to do what
21 you have done so well in your presentation, which was
22 try and delineate this. And I'm struggling with how
23 to say anything other than this is just schizophrenic.
24 I mean, it doesn't offer anything of value to the
25 United States Radiation Protection Program that I can

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1 see.

2 You know, the U.S. Nuclear Regulatory
3 Commission through its own devices to its licensee and
4 through the agreement states offers a fairly robust
5 system that is in place for, you know, lots of
6 applications and lots of reasons and has addressed
7 pretty much every example in one way or another with
8 one requirement, exemption or another that is in this
9 document quite effectively, I guess, from my own point
10 of view. And I don't see where there is any added
11 value.

12 That is kind of my opening comment. What
13 do you think? By the way, Codex Alimentarius, can you
14 help us with that for those who didn't take Latin? I
15 think that means food that you eat.

16 DR. COOL: Yes.

17 CHAIRMAN RYAN: Okay. Good. We got that
18 all squared away.

19 DR. COOL: The Codex Alimentarius is a
20 document of the Food and Agricultural Organization
21 which lays out criteria for radionuclides in food. It
22 is actually its own commission which looks at many
23 things besides just radionuclides in food products.

24 CHAIRMAN RYAN: I guess my --

25 DR. COOL: It is based on Geneva, I think.

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1 CHAIRMAN RYAN: After I get through the
2 frustration, I think about the fact that the ICRP was
3 chartered to develop radiation protection guidance for
4 the world. Now, if we in the United States, given
5 that we have some standing in radiation protection
6 practice in this organization, are struggling with
7 this, can you imagine what an emerging radiation
8 protection program is going to do with it? I just
9 can't see where this is even close to on target.

10 DR. COOL: I would agree.

11 CHAIRMAN RYAN: Well --

12 DR. COOL: That is exactly the position
13 that we find ourselves in.

14 CHAIRMAN RYAN: I guess --

15 DR. COOL: And I am in hopes, Mr.
16 Chairman, that you do not think that I can actually
17 give you an answer in this particular case.

18 CHAIRMAN RYAN: No.

19 DR. COOL: As to why ICRP has written this
20 particular document and certainly in this particular
21 way, because I cannot. As I said, we have not found
22 it particularly useful. We have found it confusing
23 and, in fact, there are a number of places where we
24 could find it, dare I say, dangerous because of some
25 of its suggestions and the discontinuities with the

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1 established system that we have.

2 CHAIRMAN RYAN: You know, and if I try and
3 reach for a science principle that's missing here, it
4 is what we would call ALARA. They call it
5 optimization. I mean, they mention it in passing and
6 give a definition of it, but there is no coherent
7 application of optimization to any of those values or
8 any of those situations that they talk about in the
9 report.

10 You know, I mean, releasing patients with
11 radioactive material from a therapeutic or a
12 diagnostic procedure in the big picture of radiation
13 exposure is not a huge risk. There aren't that many
14 patients released per day and, you know, care givers
15 and the other things have all been addressed either in
16 NRC or agreement state requirements. So I just
17 struggle with where is the real value to helping
18 radiation protection practitioners enhance their
19 radiation protection program. I don't get it.

20 DR. COOL: We haven't found any either.

21 CHAIRMAN RYAN: Okay.

22 DR. COOL: As I would --

23 CHAIRMAN RYAN: Yes.

24 DR. COOL: As I would note, I think we are
25 very much -- actually, very much already aligned with

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1 the things that you are suggesting, because it is
2 seemingly inconsistent.

3 CHAIRMAN RYAN: I'll maybe come back to a
4 summary.

5 DR. COOL: I'm just talking as the staff
6 here.

7 CHAIRMAN RYAN: Right.

8 DR. COOL: But it's inconsistent with an
9 approach of constraints. And, as you have pointed
10 out, it's not at all clear what this is in
11 relationship to optimization because clearly there are
12 some cases. In fact, the report at one point is
13 sufficiently schizophrenic that it talks about these
14 being generic levels, but that one should always do
15 more when there is a component that gets to be worked
16 on. So there is at least one place in this report
17 where the hand giveth and the hand taketh away in the
18 space of two lines.

19 CHAIRMAN RYAN: Yes. Let me offer other
20 Members the opportunity to ask questions and I will
21 maybe come back to a summary point that I think would
22 be really a very short letter for us to write, but let
23 me -- and I'll talk to you about that in a minute.
24 Jim?

25 MEMBER CLARKE: Just one question, Don,

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1 and I think you addressed it. I just want to make
2 sure I understood it. Can you back up one slide,
3 slide 14? The generic exemption levels exceed
4 decommissioning screening criteria. This is the
5 attachment to the NRC/EPA Memorandum of Understanding.

6 DR. COOL: Correct.

7 MEMBER CLARKE: Of the soil levels,
8 groundwater.

9 DR. COOL: Correct, correct.

10 MEMBER CLARKE: Okay.

11 DR. COOL: That equally applies to some of
12 the other things that are ensconced even in some of
13 the legislation of UMTRCA and some other places where
14 you find values for radium and uranium and you look at
15 those values. And then you look at the values that
16 are suggested for head of chain as a generic exemption
17 and you see that their generic exemption is at a
18 greater activity per unit concentration than that
19 which our regulation, that our legislation, our legal
20 construct, requires consideration.

21 MEMBER CLARKE: Okay. Thank you.

22 CHAIRMAN RYAN: Ruth?

23 MEMBER WEINER: I share your concern about
24 the inconsistencies and I just have one question. Are
25 the exemptions consistent with IAEA A1 and A2 values?

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1 DR. COOL: Mostly, but not completely. I
2 will speak from not having done that particular
3 analysis this time around. But, in fact, as we were
4 working with the IAEA and the EC related to the
5 control of solid material, and particularly the Office
6 of Research working on, I think it was, NUREG-1640,
7 our modeling, there was some effort to try and look at
8 what was A1, A2, what was the various criteria.

9 And there are similarities, but there are
10 also differences because the models use different
11 assumptions about the exposure scenarios and
12 otherwise. And so, in fact, you do not have a line-
13 by-line consistent harmony of the requirements.

14 Where that causes more problems, I
15 believe, now I'm doing this off the top of my head,
16 there are more problems with the surface dose/surface
17 contamination transportation requirements which would
18 fairly easily be tripped by transportation of larger
19 bulk quantities of a material at the activity per
20 becquerel generic exemption level.

21 This was something that the staff pointed
22 out to the Commission as we prepared our proposal for
23 them a year ago. In fact, the staff in taking that
24 proposal to the Commission chose to use the
25 transportation levels so as to try and have the

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1 proposal that we were giving them have some
2 consistency and avoid that disconnect. The
3 Commission, of course, at this point has chosen to put
4 that rule making on hold given some of the other
5 issues in security and otherwise.

6 So that hasn't ever gone through more of
7 the rule making process. But, in fact, that is
8 exactly an issue which we attempted to try and deal
9 with and this report simply notes that it exists and
10 you should use whichever one is applicable at the
11 moment, which again, as I noted to the Chairman a
12 moment ago, doesn't particularly help if you're
13 actually trying to construct a new on first principles
14 regulatory construct or to use IAEA's more fancy
15 language, a de novo regulatory regime.

16 CHAIRMAN RYAN: Bill?

17 MEMBER HINZE: One quick question, Don.
18 On slide 7, can you give me the rationale for
19 excluding cosmic radiation at ground level, but say
20 nothing about earth shine, about the radiation flux
21 from the earth itself?

22 DR. COOL: No.

23 MEMBER HINZE: Okay. I like that kind of
24 answer.

25 CHAIRMAN RYAN: That's one more example.

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1 MR. KOCHER: Just for example.

2 MEMBER HINZE: I suspect there is an
3 answer to that and that is it's handled in the
4 exemption levels for specific naturally occurring
5 radionuclides is my guess.

6 CHAIRMAN RYAN: Yes, but that could be
7 internal only for the --

8 MEMBER HINZE: Right.

9 CHAIRMAN RYAN: -- naturally occurring
10 radionuclides. Who knows. It's not clear either on
11 that point.

12 MEMBER HINZE: Natural origin in the human
13 body.

14 MR. KOCHER: I wanted to ask a question
15 about --

16 DR. COOL: I didn't come back quite far
17 enough, did I? There we go.

18 MEMBER HINZE: No, sorry, I'm through.

19 MR. KOCHER: Could you go to page 10 for
20 a second? Yes, thanks. This is what I was referring
21 to, these exemptions or exclusions for natural
22 radionuclides and materials, and what I wanted to ask
23 you, Don, was do they define materials? Does this
24 include, for example, hectares of overburden from a
25 mine or --

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1 DR. COOL: In this you're referring to?

2 MR. KOCHER: One up, yes. I mean, do they
3 give a definition of materials in any way, shape or
4 form?

5 DR. COOL: They give a very broad sort of
6 view, so they don't give a very precise definition.
7 I think your hectares of overburden could be
8 considered as part of that at this concentration.

9 Amongst other places, a one word
10 transposition gives them products versus, I forget
11 what it was, produce, which gives them considerable
12 difficulty as they describe how some of these things
13 should be applied. It's one thing if you apply it to
14 produce. It's quite a different thing if you apply it
15 to all products.

16 MR. KOCHER: I suspect that one of the
17 issues that is behind a lot of this is ICRP is kind of
18 forced in a way to seek a lowest common denominator.
19 And if they have set these exemption levels for
20 natural materials quite a bit lower, then you have
21 large regions of Brazil that must be controlled.

22 DR. COOL: Correct, correct. And that has
23 been --

24 MR. KOCHER: So they are not really out to
25 define a regulatory framework that would fit the

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1 United States or any other particular country and this
2 is, you know, a problem.

3 DR. COOL: You are correct. That issue
4 and the rather large variations you see from place-to-
5 place and time-to-time has been a constant theme of
6 discussion or a thorn in the side, depending on how
7 you look at it.

8 As we and others have tried to develop
9 criteria for when you might release solid materials
10 and otherwise, as I think perhaps if Commissioner
11 McGaffigan were here, he would be quick to point out,
12 either at some of these sorts of levels, if you get
13 down to the Capitol Building and the House and Senate
14 Office Buildings, you have discovered that you haven't
15 chosen a greater quantity than these. Depending on
16 how you write this, most of the Cliffs of Cornwall
17 would not be -- would have to be controlled in some
18 various way.

19 MR. KOCHER: Yes.

20 DR. COOL: So there is a difficulty.
21 Quite obviously, there is a difficulty between how you
22 might construct a philosophy that would allow you to
23 make a decision in a particular circumstance and some
24 attempt to define universally a set of numbers that
25 would always be reasonable and appropriate.

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1 The first is something which seemingly
2 could be done in terms of a decision pathway, an
3 approach that could be taken. The second, of course,
4 is much more difficult. And, in fact, this gets to
5 something which underlies this, which is the
6 continuing theme that doses on the order of a few,
7 some tens of micro sieverts, a millirem or two, are
8 things which people accept without further
9 consideration.

10 Now, that is a very interesting and rather
11 boldfaced statement which is true or not true
12 depending upon the way in which you look at it. And
13 here I will give you my personal view on this
14 particular subject. If I were to come up to you,
15 Ruth, and say is 1 millirem acceptable, you would
16 probably say no, because there is no context
17 associated with it and why should anything be
18 acceptable without any context.

19 But if after the space of six months where
20 we have been talking about this particular site that
21 you may be interested in, and what all the impacts are
22 and how much it's going to cost and all the damage
23 that it does to everyone and the dust and things from
24 cleaning all of this up or doing whatever it is, you
25 might conclude that 1 millirem in that particular

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1 context, in that particular decision process, is
2 perfectly appropriate.

3 The difficulty comes in taking that result
4 of a decision process with all of the factors that are
5 associated with that particular decision and assuming
6 that someone outside of that decision process or in a
7 different decision process or without any decision
8 process would reach the same conclusion.

9 CHAIRMAN RYAN: Don, you have hit, to my
10 way of thinking, the root of the problem. The root of
11 the problem is this, to me, reads as if it's two
12 documents that they kind of tossed the pages up and
13 recollected them and put them in that order. There is
14 a document that talks about these principles. It's
15 kind of written like the European Union charter.
16 There is an international, you know, flavor of
17 legalistic kind of language and principles and all of
18 that.

19 And then they have woven into it these
20 very specific technical recommendations that when you
21 get to things in the EU, for example, they are in
22 safety directives or they are in other documents.
23 There's lots of other examples, you know, of U.N.
24 treaties and charters and agreements that don't get
25 into this detail, that that is done later in

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1 implementation documents.

2 And I'm just trying to understand the
3 rationale here of why you would try and create a
4 principles document that will address Brazil, Uruguay
5 or the United States, Canada or, you know, the
6 Republic of the Marshall Islands for that matter, and
7 principles of how you would set something up like this
8 and then, you know, leave it at least in some generic
9 way for how you would implement it for those
10 particular circumstances in those places with those
11 folks.

12 And, I mean, I just really don't
13 understand how the ICRP, based on its charter, can get
14 to this, frankly. So I'm struggling. Dave, have you
15 got any more questions?

16 MR. KOCHER: I'm not a regulator, thank
17 goodness for everybody. If I am the NRC and looking
18 at this, I am a lot less nervous if my criteria are
19 coming in under the bar than I am if they are coming
20 in over the bar, so to speak. So the fact that --
21 drinking water standards is a perfectly good example.
22 This is not an NRC problem, but it's a U.S. situation
23 because it's now in law.

24 These were based on what in a U.S. society
25 and economic system was judged to be reasonably

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1 achievable, but to say that set of criteria applies in
2 Kazakhstan is a different story entirely. And, I
3 mean, you should feel good if you're -- I would think
4 you should feel good if your criteria come in under
5 the numbers that these people are putting out. You
6 might be a little more nervous if you're well over.

7 CHAIRMAN RYAN: I would say, Dave, that
8 you could take that view, but I would take perhaps a
9 different view. I think the very process that created
10 the drinking water standards stands on its own two
11 legs. It was deemed to be an acceptable and risk-
12 informed view of drinking water in the United States.
13 There is absolutely no reason that there has to be
14 concurrence above or below any other country's
15 decision.

16 That is my view and that is why I struggle
17 with this document. It tries to regularize something
18 that by its very nature does not have to be and
19 perhaps should not be regular. You know, think of it
20 just in the abstract. If we decided medical X-rays
21 shouldn't exceed some number, well, what if you need
22 three X-rays to diagnose the disease?

23 You know, the doctor says we're going to
24 do a cardiac catheterization on you and you're going
25 to get 50 rads to the chest so I can figure out how to

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1 keep you from dying today, are you okay with that?
2 Yes, sir, go for it. You know, that kind of thing.
3 So I struggle with the fact that these absolute
4 numerical values in this document have any meaning
5 beyond just some kind of benchmark that, you know,
6 could be exactly misused in the way you talk about.

7 People feel good because they are under
8 it. Maybe they didn't optimize enough. It could be
9 they could do a lot better. Or they are over it. Oh,
10 my God, we got to do something when, in fact, there is
11 only 1,600 people that are even affected in that area.
12 So I am struggling with how you get what is a
13 principles document now seasoned with these numbers
14 throughout. So I really don't see the value of this.

15 In fact, as Dr. Cool pointed out at the
16 beginning, I see the potential for huge confusion as
17 we did, by the way, with the previous ICRP draft
18 documents. Latif, you had a question?

19 MR. HAMDAN: No, I have a question, but
20 I'm waiting, you know, until my turn comes.

21 CHAIRMAN RYAN: Okay. Well, you had your
22 hand up a couple of times. I saw his hand first.

23 MR. HAMDAN: Okay. Okay. You probably
24 stole my thunder a little bit.

25 COURT REPORTER: Mike.

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1 MR. HAMDAN: Oh, I'm sorry. The question,
2 you know, let's step back to the document. We know
3 what the document is and what the comments on the
4 document are from you and Mike and everybody else and
5 that is clear. It's not a very useful document and
6 it's confusing, all of the things that were mentioned.

7 But don't we have another? If this is the
8 case and this is the ICRP, such a prestigious
9 organization, and I suppose we know them a little bit
10 or we know a little more about them, you know, than
11 probably most other people, wouldn't we have a
12 responsibility then to answer two other questions?
13 Number one, what are the programmatic -- there is
14 probably some programmatic problems, whether they are
15 related to process or to policy or philosophy, all
16 these were mentioned.

17 And so I think this question needs to be
18 at least somehow rather to the document itself. In
19 other words, you look at this document and other
20 documents that you know about, and whatever you know
21 about this ICRP and really you need to make some --
22 you may want to make some observations about that.
23 And number two is, you know, I'm not really familiar
24 with the ICRP. That is why I'm suggesting this.

25 You know, the U.S. influences everything

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1 in this world and I know you have been there more than
2 once, you know, and Mike, you know, he is the head of
3 the Physics Society and what have you. Don't we have
4 a responsibility to influence this organization and if
5 we do not, why we don't? Why don't we?

6 CHAIRMAN RYAN: What is the question,
7 Latif?

8 MR. HAMDAN: The question is are there
9 structural or programmatic problems with the ICRP?
10 And the other question is can the U.S. delegation do
11 something about them?

12 DR. COOL: Okay. Well, that's a very
13 interesting pair of questions.

14 CHAIRMAN RYAN: If I may, Don.

15 DR. COOL: Let me deal with the second one
16 first, but please feel free.

17 CHAIRMAN RYAN: That's an unfair question
18 of Don and let me tell you why. Don is a member of a
19 committee for the ICRP and he is on a particular
20 science committee. And I think it's unfair to put him
21 on the spot with that question, frankly, because
22 you're asking him to make a judgment about an
23 organization in which he has got standing and so
24 forth.

25 So I would offer you that that's probably

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1 -- answer it if you like, but, you know, I would
2 certainly understand if you didn't want to answer it.

3 DR. COOL: I will make a couple of
4 observations. First, although we try to take every
5 opportunity to influence international organizations,
6 not just ICRP, IAEA, NEA and others, the degree of our
7 influence is at least in part dependent upon the
8 degree of our standing within that organization.

9 So for IAEA the United States has an
10 official member seat in the Commission on Safety
11 Standards. Marty Virgilio holds that seat. We have
12 an official seat in the Radiation Safety Standards
13 Committee. Charles Miller holds that seat.

14 And so we can take multiple opportunities
15 to influence and craft and we always have perhaps the
16 opportunities to jump up and down and play the 800
17 pound gorilla for things which are really egregiously
18 difficult and should not move forward, and we have
19 been known to do that on occasion.

20 The ICRP is an independent charity
21 chartered in the United Kingdom, members of whom are
22 asked to serve on this commission under the auspices
23 of the International Radiological Protection
24 Association and have no organizational or other
25 standing. And so our ability to influence such an

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1 organization comes simply by our ability to be
2 constructive and useful in helping them see particular
3 issues and in working with them to see how things can
4 be put together.

5 And, in fact, we have been quite
6 successful in doing that in some cases. And there
7 have been cases such as this where we have had no role
8 to play and which, in looking at it, perhaps I'm just
9 as glad.

10 CHAIRMAN RYAN: Let me sum up by offering
11 Don -- oh, I'm sorry, Ruth. Go ahead. Pardon me.

12 DR. COOL: Ruth?

13 MEMBER WEINER: Since I have been sitting
14 here staring at your slide 10 --

15 DR. COOL: You have found something now.

16 MEMBER WEINER: Well, you look at it long
17 enough and the confusion starts to dissipate into a
18 question. A becquerel of Thorium-232 is a becquerel
19 of Thorium-232. Why the difference between natural
20 radionuclides?

21 I can see a sort of rationale for a
22 standard for natural radionuclides that is based
23 somehow on natural occurrence. I mean, if you have
24 got this much Thorium-232 in the ground then, you
25 know, you may as well set the standard there.

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1 But I don't understand the rationale for
2 a different standard for -- exactly. I don't
3 understand the rationale for a different standard for
4 artificial, the same radionuclide artificially
5 produced, whatever that means. And could you
6 enlighten me as to what the rationale for that was,
7 is? Maybe I'm all wet.

8 CHAIRMAN RYAN: Well, join the club, Ruth.

9 DR. COOL: My first response is to simply
10 say no. My second response, I cannot enlighten you.
11 No, I cannot enlighten you.

12 My second response is to simply make the
13 observation that in this report it seems to be driven
14 by the pragmatic realities of what has been done in
15 various and sundry places to sidestep or otherwise get
16 around the difficult issue that a radionuclide in the
17 ground existing at some concentration, highly variable
18 from place-to-place within a particular country, is
19 not really something that you can do anything about or
20 exert any controls over, but that for some reason,
21 perhaps because we made them or perhaps because we
22 moved them around from place-to-place, we entertain
23 the notion that if it was manmade or that we did
24 something with it, that we then can exercise a much
25 greater degree of control and, therefore, we should

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1 irrespective of whether or not it poses a similar
2 risk. I'll go back to my first answer.

3 CHAIRMAN RYAN: Yes, go back to no.

4 MEMBER WEINER: Yes, I think no was the
5 answer from the point of view of effect. I mean, I'm
6 sure that I am preaching to the choir here. From the
7 point of view of effect, it doesn't make any sense.

8 DR. COOL: You are correct.

9 CHAIRMAN RYAN: I tried to jot down a
10 couple of sentences, Don, that hopefully will sum up
11 what I think our discussion has led us to. The ACNW
12 in short believes that this document does not add any
13 significant value to the Radiation Protection Programs
14 in the United States, especially those promulgated by
15 the Commission for its licensees and for licensees and
16 agreement states authorized by the Commission.

17 The Committee also believes that there are
18 inconsistencies between this ICRP draft document in
19 the terminology, form and details of the U.S.
20 regulations and supporting documents that regulate
21 radioactive materials and radiation in all aspects in
22 the United States. Therefore, the Committee believes
23 this document should be rejected in whole.

24 DR. COOL: I'm not sure what rejected
25 means to the ICRP, but the NRC staff in drafting up

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1 its comments has reached the same conclusions as --

2 CHAIRMAN RYAN: How about rejected as
3 unacceptable?

4 DR. COOL: Is not acceptable or not
5 useful. To be quite frank with you, our effort to try
6 and write something has led us to the sorts of things
7 in the way of expressing it that I had it here. We
8 find it confusing. We find it not useful. And we
9 don't understand how it can help to elaborate the
10 basis of the draft recommendations, which we
11 understand it is intended to be an underpinning of.
12 And those are the comments that we intend to prepare.
13 It sounds like the Committee is in exact agreement
14 with the positions that we are in.

15 CHAIRMAN RYAN: I guess what I'm
16 struggling with now, and I appreciate any staff views,
17 is I think the letter we could write to the
18 Commission, one, supports the staff's views as
19 presented by Dr. Cool today and, two, this short
20 summary paragraph is all we need to say.

21 I don't think we need to try and go
22 through any detailed analysis as you have obviously
23 presented, the front end of yours to us today and, as
24 you have mentioned, have more analysis that will go in
25 your comments, and we write a very short letter to the

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1 Commission that says we just find this draft to be
2 unhelpful, unuseful and it should be rejected as not
3 adding any value to our radiation protection practice
4 or programs. End of story. I mean, is that --

5 MEMBER CLARKE: I would recommend a short
6 letter.

7 CHAIRMAN RYAN: A very short, one or two
8 paragraph letter, one page and we're done. You know,
9 I mean, it was tough enough to get through the
10 foundation documents and the supporting documents, you
11 know, on the draft recommendations, but I just don't
12 see how the ICRP can think of this as being effective
13 to now write this one separately, reissue a new draft
14 that may incorporate some of this stuff, God knows
15 how, and then, you know, somehow resolve all the
16 hundreds of comments they got on the foundation
17 documents and the principle recommendations and
18 declare victory and issue a new principle
19 recommendation. I just don't see how they are going
20 to get there.

21 DR. COOL: Well, I can't help you with
22 that letter question, because --

23 CHAIRMAN RYAN: Yes. I mean, that's just
24 an observation. I'm not looking for a question and
25 answer there.

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1 DR. COOL: From the staff's viewpoint, I
2 don't believe that we need any such letter to
3 reinforce our view that we need to send them the
4 comments that we have drafted. I just would leave it
5 up to the committee.

6 CHAIRMAN RYAN: But I do think we have got
7 the obligation and because of our scope of work for
8 the Commission, that we owe them a letter to tell them
9 we certainly support your approach and your comments,
10 as you have presented today, and that we in our own
11 reading find this to be an unhelpful, unuseful
12 document just so they hear it from us.

13 DR. COOL: As I noted, the staff plans to
14 provide its comments to the ICRP as staff comments.
15 We'll be providing a copy of that to the Commission
16 for their awareness probably through the typical D
17 note type of process because we don't --

18 CHAIRMAN RYAN: And maybe, in fact, we'll
19 recognize that path in our letter.

20 MEMBER CLARKE: The Commission can take
21 those documents to --

22 DR. COOL: We have not viewed this as
23 something which needed, warranted getting Commission
24 views on. On the other hand, the draft
25 recommendations when they come out will.

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1 CHAIRMAN RYAN: Yes, that's --

2 DR. COOL: That is --

3 CHAIRMAN RYAN: That will need everybody's
4 approval.

5 DR. COOL: And so what we have been trying
6 to do is to pursue within the staff a consistent
7 framework for how we're behaving towards some of these
8 documents and how we will behave in a more elevated
9 and specific manner with the draft recommendations.

10 CHAIRMAN RYAN: With the Committee's
11 indulgence, I will draft a very short letter and we'll
12 take it up tomorrow to read out, sign out and get to
13 the Commission. All right. Any other comments,
14 questions? Well, Don -- I'm sorry. Jim?

15 MEMBER CLARKE: Under the "for what it's
16 worth" category, I thought your second answer to
17 Ruth's question was very thoughtful, measured and
18 right on target. My experience with environmental
19 restoration for non-radionuclides supports that. We
20 know there is background lead. We know there is
21 background arsenic. We can't do anything about that,
22 but we can do something about your site and this is
23 the number we want you to achieve.

24 So, I mean, I really think -- and I'm not
25 an advocate of this thinking, by the way, but I think

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1 your answer was probably right on target and it
2 certainly supports my experience.

3 CHAIRMAN RYAN: Sure. Thank you. Don,
4 thanks very much. I know it's a struggle to get
5 through a document like this. We really appreciate
6 your insights and coming down for an hour.

7 DR. COOL: And we look forward to being
8 with you again probably in another couple of months
9 when we have got the main recommendations.

10 CHAIRMAN RYAN: Indeed.

11 DR. COOL: And we will have some
12 interesting discussions, I suspect.

13 CHAIRMAN RYAN: Indeed. Thanks very much.
14 Anything else? I guess we're at the letter writing
15 stage. Professor Hinze, are we ready?

16 MEMBER HINZE: Ready.

17 CHAIRMAN RYAN: I'm going to suggest we
18 take just a five minute break and let everybody
19 freshen up, and then we'll be right back.

20 (Whereupon, the meeting was concluded at
21 2:36 p.m.)

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