

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

PUBLIC WORKSHOP ON GUIDANCE FOR
IMPLEMENTING 10 CFR PART 20, SUBPART E

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Auditorium

11545 Rockville Pike

Rockville, Maryland 20852

Wednesday, August 18, 1999

The above-entitled meeting commenced, pursuant to notice, at 8:31 a.m.

PARTICIPANTS:

LARRY W. CAMPER, Branch Chief, Decommissioning Branch, Division of
Waste Management, NMSS

TIMOTHY JOHNSON, Section Chief, Division of Waste
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P R O C E E D I N G S

[8:31 a.m.]

MR. CAMPER: Good morning.

Sorry for the delay. It was like a NASA launch, and we had to hold the launch at T minus 30 seconds, I think.

Good morning. My name is Larry Camper. I'm the Chief of the Decommissioning Branch. I want to welcome you to this workshop.

Most of you don't know me. I became the Chief of the Decommissioning Branch the beginning of July. Prior to that, I spent four-and-a-half years as the Chief of the Materials Safety and Inspection Branch.

So, for me, I look at this as an opportunity to get to know a different segment of the industry, to get to know some of you much better than I do already, and to work together to begin to solve some problems that face us in the decommissioning arena.

So, I welcome you, and I want to encourage you to participate enthusiastically.

I have a number of comments that I want to step through that the staff has prepared for me to make sure that I don't miss anything. So, if you'll bear with me, I'll step through these various comments as opening remarks.

This is the fifth in a series of six public workshops being sponsored by the NRC to assist in developing guidance to support the decommissioning of facilities under the license termination rule.

We previously held workshops in December of 1998, in January, March, and June of 1999, covering dose modeling, restricted use, ALARA analyses, and ground water modeling.

This workshop will focus upon license termination plans, decommissioning issues identified by state regulatory agencies, and surveys to support decommissioning.

In addition to the license termination rule guidance development workshop

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1 already scheduled for October, we intend on holding additional workshops on LTPs in the near
2 future, and the staff is working with NEI and others to arrange dates and locations, so keep that
3 on your scopes, and more to follow.

4 When these dates and locations are finalized, we will announce it in the Federal
5 Register and post the meeting notice on our web-site.

6 I would like to thank all of the industry and government speakers, Federal and
7 state, for taking the time out of their busy schedules to put together what I believe will be a very
8 interesting workshop for you.

9 A lot of work goes into these types of things, both in speakers preparing and for
10 my staff, and a number of members of my staff, in particular, worked very, very hard. Most
11 noteworthy are Larry Pittiglio and Nick Orlando, and others, as well.

12 I'd like to make it a point that, while we have tried to inform all interested parties
13 at previous workshops through the use of the internet, articles in the NMSS newsletter, the
14 Federal Register notice, and other venues, we did make it a point this time to contact a number
15 of stakeholders who have expressed an interest in decommissioning of reactors of this
16 workshop and invited them to this workshop and to participate.

17 I hope that the stakeholders, industry and otherwise, all stakeholders, will
18 actively participate today.

19 We have a number of openings around this table, as you can see.

20 I would encourage you not to be shy, at least take a place at the table,
21 particularly if there are issues that -- when we come to something on the agenda that you want
22 to express your interest in, make your views known, please come to the table and actively
23 participate. We also have microphones set up there near you.

24 So, don't be shy. I doubt that you will, but I'm encouraging you not to be shy.

25 We have tried today to structure the sessions so that we will focus upon the
interaction with the stakeholders.

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1 For the topics, we're going to have a very brief overview presented by a member
2 of the staff and then open up the floor to discussion in each of the sessions.

3 We had originally thought about having a stakeholders session late in the
4 morning and then again in the afternoon, but we felt that sometimes when you do that, a
5 particular issue that's pressing at the moment on you remind, you forget about it or you forget
6 exactly the point you wanted to make at that moment in time.

7 So, we felt it was a better format to have a brief overview of each of the topics
8 and then afford you an opportunity during that session to express your views and concerns and
9 what have you.

10 So, we hope that this will facilitate an exchange of information.

11 This morning, we're going to be discussing the LTP process, final surveys, and
12 lessons learned from several reactor decommissionings, as well as the release of buildings and
13 sites prior to the LTP approval and cost estimation.

14 I want to encourage you to stay on schedule, if we can. Particularly make a
15 point, if you would, please, to be here at one o'clock. Chairman Dicus has agreed to drop by
16 and spend a few minutes with us.

17 We're very fortunate to have her. She has a very busy schedule under normal
18 conditions, but we're particular fortunate to have her this week, because she's been involved
19 with jury duty, and we literally didn't know until COB yesterday whether she was going to be
20 participating in a trial somewhere as a juror.

21 So, we're very, very happy to have her with us today.

22 We're going to discuss a concept today called rubblization. I want to make a
23 few comments about that.

24 It's a new concept that has been suggested by some in the nuclear industry as a
25 way to manage contaminated concrete.

We are currently -- the NRC staff is currently developing a position on this

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1 concept, but as of right now, we have not made any decisions as to whether this particular
2 methodology is appropriate or not.

3 We are, in fact, preparing a policy Commission paper for consideration by the
4 Commission. Our objective is to get that paper to the Commission sometime in September.

5 So, the timing of this meeting is most fortuitous to aid the staff in factoring in the
6 views that will be expressed by the various stakeholders during this meeting today on this
7 important emerging technical topic.

8 We set aside two hours for this session. We think there will be a great deal of
9 interest in it.

10 We are interested in hearing the spectrum of views.

11 We have talked with some representatives of industry about this issue. We've
12 asked them today to help us by articulating what the concept means to them, in technical terms
13 and in practical terms, and we want to get as many views as possible.

14 We are in a listening mode on this topic, and I was to reiterate that. We are in a
15 listening mode. So, this is an excellent time to express your concerns and viewpoints, and it will
16 help us prepare a much better policy consideration paper for the Commission to look at.

17 Tomorrow morning, the venue of the meeting changes a little bit. We're going to
18 turn the meeting over to Dennis Zannoni from the State of New Jersey, Department of
19 Environmental Protection, who will be the lead for a number of presentations and discussions on
20 states' perspectives on decommissioning of licensed facilities.

21 In addition to presenting the New Jersey views, Dennis is representing the
22 Conference of Radiation Control Program Directors, and so, I want to make a special thanks to
23 Dennis for wearing two hats and doing twice as much work.

24 Tomorrow afternoon, we will discuss some of the technical issues associated
25 with surveys to support decommissioning as well as comments on Draft Regulatory Guide
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DG-4006, the staff draft guidance on demonstrating compliance with the license termination rule.

1 And finally, at the conclusion of tomorrow's session, we want to talk to interested
2 parties about participating in a short planning meeting for the workshop in October.

3 We have had some requests to postpone the October workshop one week, from
4 October 20 to 21 until October 26 through 27, and we'd like to discuss that particular issue
5 further tomorrow, as well, as we talk about a planning session for the October meeting.
6

7 We have hyperlinked the NRC web-site to the decommissioning guidance
8 development web-site. To get the decommissioning guidance web-site, you go to www.nrc.gov,
9 click on radioactive waste, click on nuclear facilities decommissioning, scroll down to special
10 projects, and click on standard review plan for decommissioning. This will then hyperlink you to
11 the appropriate web-site, and we can make that address available to you throughout the day, in
12 case you didn't get it. Talk to myself or Nick Orlando about it.
13

14 We have posted several draft standard review plan modules on the web-site,
15 and copies are available in the atrium. The only module not currently on the web-site is the one
16 on dose modeling. We hope to have it posted by October.

17 In addition, we've decided to extend the comment period for the draft modules
18 that were distributed at the last workshop. As of now, comments on all the draft modules will be
19 accepted until February 2000, February 15, 2000.
20

21 As an administrative point, I want to make you aware of the fact that there are
22 restrooms back across the atrium.

23 Upstairs, on the first floor, there is a large cafeteria. Coffee is available there
24 during the breaks. They have a pretty good lunch selection. It ranges from, you know,
25 full-course entrees to sandwiches to salads to soup, so it should cover the bases for you,
whatever your interest might be.

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There are some places nearby. Perhaps the staff can tell you where they are,
but I'm not sure that they're any better than what you'll find upstairs.

So, with those opening comments, we do have a pretty full day, and I'm going to

ask Larry Pittiglio, who's going to make our first overview presentation, to get us started.

Thank you.

I'll be around during the course of the day, and if there are issues you want to talk with me about or some questions you'd like answered, if I can, I'll be happy to interface with you.

So, let's make it a good workshop, and again, I encourage you to actively participate.

Thank you.

MR. PITTIGLIO: Good morning. Welcome, everybody. I'm Larry Pittiglio, and I work in the decommissioning branch.

Before I start, Nick Orlando will be changing the slides for me. Nick was the individual that really has been the coordinator and major effort behind all the series of workshops, and to my right is Tim Johnson, who is the section leader of our decommissioning projects.

We're going to give you a brief overview of the license termination process. We recognize that many of you from the reactor side are well-versed in it, but we're also very fortunate today to have some material licensees here, and we want to highlight the difference.

Nick, first slide.

The first slide basically identifies the regulatory basis for the license termination plan, and it's dictated by two different requirements. The first was the change to the decommissioning regulations in 1996, and then, in July of '97, specifically, the license termination rule calls out specific requirements related to the license termination plan.

Next slide, please.

The LTP approval process really requires the following:

The submittal of the LTP at least two years before the date of the termination of the license.

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Now, that's what the regulation says.

I just want to point out, from our perspective with NRC, we encourage the licensees to submit the license termination plan earlier. Earlier is better, but the regulation does indicate that it could be as late as two years before termination of the license.

There is a notice of availability of the LTP. We will hold a public meeting near the site. Typically, we'd try to do that, generally, within 90 days after we receive the LTP, and the approval of the LTP process is by a license amendment action.

Also, it probably will occur, for LTPs that we receive in the near term, that they will be available through our new ADAMS system and will be up on the web-site, so you'll be able to get a copy of it and look at it.

Slide, please.

What I'm really going to do now is just briefly identify the requirements in the LTP. They were dictated by 50.82 and by Subpart E. Basically, they were literally taken out of the rule, and the license termination plan should include a site characterization or reference the characterization, have details of the remaining dismantlement activities, detailed plans for site remediation, detailed plans for the final radiation survey, of course the approach used to demonstrate compliance with the radiological criteria for license termination, an updated site-specific cost estimate, and a supplement to the environmental report.

Those are the regulatory requirements for the information that needs to be included.

I'm going to point out, finally, our principle areas of concern related to the license termination plan and want to point out that, for material licensees, most of you submit a decommissioning and its approval process occurs mostly before any decommissioning is initiated.

For the license termination plan, it could come in with a significant amount of decommissioning left to be completed, or it could well be that the decommissioning is complete

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1 by the time we receive the license termination plan.

2 The real focus of details for it will be the final radiation survey -- obviously, that's
3 a key point in demonstrating that you've met the release criteria -- the approach used for
4 demonstrating compliance with the modeling, and of course, we are going to look at the updated
5 site-specific cost estimate to make sure that sufficient funding is available to complete
6 decommissioning.
7

8 That pretty much concludes what is required in the license termination plan and
9 provides you an overview of what information we require to be included.

10 Again, I just want to point out that the LTP comes in, typically, much later in the
11 decommissioning process than the decommissioning plan does.
12

13 Do we have any questions?

14 [No response.]

15 MR. PITTIGLIO: Any comments? Okay.

16 With that, I guess, if we don't have any questions related to the LTP process,
17 we'll move on to our next presentation, which is going to be by Tim Vitkus, and it's going to
18 discuss the survey information that we need to include in the license termination plan.
19

20 Tim.

21 MR. VITKUS: Good morning.

22 Essentially what this discussion is going to focus on is the final status survey
23 planning information that should be included in the license termination plan.

24 Most of the information that I'm going to go over in these slides is pretty much
25 identified for the licensees in both Multi-Agency Radiation Survey and Site Investigation Manual,
or we'll simply that and just call it MARSSIM, and it's also in the Draft Guide 4006.

As Larry mentioned, we kind of have an interesting paradox that we have to deal
with, and that is, because the license termination plan is submitted two years or more before the
license is actually terminated, the licensees may or may not have all the information that we're

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going to talk about at hand when they do that initial submittal.

So, I just wanted to bring that up as a possible point of discussion.

Okay.

This first bullet is the methods proposed for surveying all equipment, systems, structures, and soils, and that's a pretty broad requirement.

The available guidance that's out there, meaning MARSSIM and 4006, gives a lot of information on how to handle -- or what types of methods to use for building structures, building surfaces, and also soils.

However, we see here we also have to deal with systems and various equipment.

There is not a whole lot of specifics available on that, and in general, you could probably assume it's going to require some potentially unique methodologies to address the final status survey methods for systems and equipment.

The submittal should also include basic plot plans, drawings, etcetera, of the facility, schematics of the systems and equipment, so the interrelationships can be seen more readily.

The third item is the method for ensuring that sufficient data are included for meaningful statistical survey, and this may be where we run into the timeframe problem.

We may not have all of the data that we're going to need for completely designing a final status survey using the statistics in MARSSIM, but a lot of it should be available from characterization surveys that have already been performed and completed, and if decommissioning has been going on at the site, a lot of the remediation control survey data may be adequate to submit as part of the design for the final status survey.

Okay.

A description of the background -- of the methods used for background radiation levels -- that's especially important for -- when we're performing surface activity measurements

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1 on building structures, etcetera, or converting our gross surface activity measurements to a DPM
2 per hundred square centimeter that the DCGL will more than likely be in.

3 Essentially what has to be done is finding the appropriate background reference
4 areas, construction materials that have not been impacted by site activities to collect those
5 measurements at, also consideration for background reference soil areas.
6

7 If one if going to use the MARSSIM approach and is going to use the Wilcoxon
8 Rank Sum test, then we will have to evaluate the adequacy of the background reference area
9 selected.

10 Okay.

11 A description of the QA program -- essentially, that's also another fairly broad
12 topic. What is being looked for there is the field and analytical procedures that will be used. It
13 may just simply be a reference back to a procedure at the facility rather than reiterating the
14 entire procedure.
15

16 Staff training and qualification requirements, document and data control
17 methods, the maintenance control of field instrumentation, the calibration and performance
18 checks, procedures, lab accreditation, and data quality assessment practices.
19

20 Okay.

21 The results of scoping and other types of surveys should be summarized in the
22 document, and that's basically providing the support for how the site was initially classified and
23 the impact and the non-impact.

24 These types of surveys and the information provided should address all the
25 various structures, soils, systems, and equipment that were identified as potentially impacted
during historical site assessments and follow-up investigations.

And then provide the overall justification for how the facility was classified.

And this initial step is going to form the basis for the licensee's survey unit
subdivision. Okay?

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1 Okay.

2 The identification of the major radiological contaminants -- obviously, that's an
3 extremely critical point.

4 It's going to be how the entire final status survey design is going to come back to
5 this point, as far as which instruments are going to be selected, the various analytical
6 parameters that will need to be chosen.

7 And then, for each of those major radiological contaminants, the DCGL should
8 be provided.

9 Together with the individual DCGL for each of the radionuclides, there should
10 also be a description of how -- usually, particularly at reactors, there's going to be more than one
11 contaminant present. So, how multiple contaminants are going to be handled should be
12 discussed in the license termination plan.

13 Particularly, it's going to go a lot into how the actual survey is designed. Okay?

14 Establishment of a reference area -- a lot of people are confused. The
15 reference area is still typically your standard cartesian reference system. There's a lot of
16 confusion with the triangular sampling pattern. That does not necessarily mean establishing a
17 triangular grid.

18 We're still referring to breaking down the site into a standard useful reference
19 system that an individual can then go back and relocate a specific point.

20 The intended survey design parameters -- once again, that may be where some
21 of the information will not totally be present at the time of the initial submittal. There may just
22 have to be a commitment to use certain protocols, but things such as you have to have a
23 contaminant variability in a given survey unit in order to design your survey -- you may not have
24 that at the point of preparing the termination plan.

25 Methods for addressing hard-to-detect nuclides, radionuclides -- once again, in
reactors, that's a fairly common problem, and there's several options that are provided in

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MARSSIM, and just to mention what those are, they are the surrogate approach, where you use an easy-to-detect radionuclide as a surrogate for a hard-to-detect, and then that is taken one step further, and you may have to modify a DCGL to account for a hard-to-detect, but there is guidance on that, and it's fairly straightforward, how to implement that.

Access control procedures -- if the issue is that decontamination efforts are being performed concurrently with the final status surveys, then obviously there has to be provided the approach that's going to prevent recontaminating an area, particularly after the final status survey has already been performed.

Next slide.

Identification of survey units and area classification -- the area classification, meaning impacted, non-impacted, should pretty much be set. An area classification as far as class one, two, and three should readily be apparent from characterization activities that have already taken place, but whether or not a -- be able to, at the time of this initial submittal, actually have survey unit boundaries drawn, I think that's probably an area that may need to be further discussed.

There can be certain things that happen that may change how survey units are drawn. There's specific recommended approaches for subdividing a site into survey units, one of the most important of which is the similar contamination potential and also similar contaminant variability.

So, natural boundaries may or may not be a necessary approach.

There's also size restrictions, and the licensee may have to -- if they're unable to actually physically draw a boundary on a map and present that, then there may just have to be a commitment to limiting sizes to what's recommended, but once again, that's something that really needs to be further discussed.

Scanning procedures -- extremely important in how small areas of elevated direct radiation will be detected, and that's one of the main things that the new guidance has

1 really emphasized, is scanning.

2 It's tied scanning in directly to how the final status survey is designed, how many
3 measurements are going to be required to identify small areas of elevated direct radiation that
4 would potentially cause the dose criteria to be exceeded.

5 The MDCs for the different instruments that are going to be used during final
6 status survey will need to be in the plan.

7 That includes both field and laboratory instrumentation, and just keep in mind
8 that the MDCs should be a fraction of the DCGL, and there also has to be, I guess, a
9 cost-benefit analysis for how precise this instrumentation is going to be.

10 The more precise it is, then, potentially, the fewer measurements or samples
11 that may be required, but once again, that's something that always has to be looked at from cost.

12 Investigation levels -- essentially, there should be provided in the plan some
13 levels for soil surface scanning and structural surface scanning that will determine when a
14 contaminant may exceed the DCGL.

15 It could range from anything that's distinguishable from background to some
16 preset count per minute that's going to be a function of the instrumentation that's used, the
17 background in a specific area, etcetera.

18 And with that, any questions or comments?

19 MR. PITTIGLIO: Let me add one thing to Tim's presentation.

20 First of all, regarding both the final survey information as well as the whole
21 license termination process, we do have two guidance documents that were issued.

22 First, we have the Reg. Guide 1.179, and that was issued in January of 1999,
23 and in addition, we have the Standard Review Plan for Evaluating Nuclear Power Reactor
24 License Termination Plans as a draft for comment, and that was also issued in January of 1999.

25 So, those documents provide additional information related not only to the final
survey but the license termination process.

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1 And one other area I want to bring up something so we can focus on -- maybe
2 we'll get some input from the audience on that.

3 Several licensees have indicated -- and Tim touched on it in his presentation --
4 that at the time of the LTP submittal, they will probably have survey area classifications, they
5 may indicate the size or will commit to the size of the survey unit, as well as the classification
6 and the number of measurements but not necessarily have the survey unit itself identified.

7 We're interested in getting some comments, input on that as to what their basis
8 for that approach is.

9 So, I just wanted to identify that as an issue, Tim had mentioned it, and then
10 we'll open it up for comments or questions.

11 MR. ORLANDO: If I could just make one comment, as you can see, we have a
12 court reporter here, and anybody in the audience, if you could please identify yourself when you
13 get up to speak, and use the microphone so that he can make sure we get everything down.

14 Thank you.

15 MR. GENOA: Good morning.

16 My name is Paul Genoa, and I represent the Nuclear Energy Institute, and I'm
17 here today representing the interests of the power reactors.

18 To that end, we do have a task force of power reactor personnel, technical folks
19 that are involved in day-to-day decommissioning today. Many of them are here today in the
20 meeting, and we appreciate this opportunity to provide input and discuss some of these issues
21 as we work through them.

22 I guess to answer your last question before I comment -- and I hope that there
23 will be some other folks, as well, but I think the idea is the LTP is being submitted by power
24 reactors well in advance of final decommissioning, and at that point, while they have developed
25 the conceptual framework for establishing those survey units and identifying those areas and
identifying the number of samples that would be required and essentially are willing to provide all

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1 the information that will allow you to determine that all those issues are appropriate, they are not
2 looking to spend resources to actually develop the actual survey maps and areas prematurely,
3 before the remediation and decommissioning process moves forward, because they may
4 change and, quite frankly, because that information, in their opinion, doesn't actually add
5 anything of value at that time for you, if you are already committing.
6

7 I mean all that information is to develop if there is an adequate number of
8 sampling points being identified, and if that's committed to in advance, it's thought that that
9 would be adequate and allow those resources to work on other things at that time.

10 But perhaps someone else can describe that a little more clearly than I can.

11 But I did want to comment earlier on an issue -- Tim, I'm not sure whether you
12 want to respond to this or Karl, but it has to do with the idea of submitting the LTP well in
13 advance of the final activity, with your best information available at the time but recognizing that
14 that provides a significant challenge for currently decommissioning plants in that there are a
15 variety of technical issues that aren't well developed and well resolved.
16

17 For power reactors, as you might know, cobalt and cesium are key isotopes.
18 They're both gamma emitters, provides, you know, significant doses and drive the doses.
19 Fortunately, they're relatively short-lived, but fundamentally, the dose assessment codes today
20 don't necessarily deal with those two isotopes in a satisfactory way.
21

22 That's been identified and discussed, there is a path forward to resolve some of
23 those issues.

24 That, combined with the issue of hard-to-detect activity, whether it be in
25 embedded pipes, and how to deal with that issue, the residual activity left in embedded pipe, or
perhaps inaccessible areas, cracks, crevices, and so forth, how do you characterize that, how do
you model that, what are those inclusions?

So, the currently decommissioning are working through this process with some
of those issues relatively unknown.

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1 Still, they're going to take their best shot and they're going to develop DCGLs
2 based on that and submit them.

3 My question to you is what's the appropriate change process should a licensee
4 determine after approval that, for a variety of reasons, either the DCGLs need to change or other
5 elements within the LTP?
6

7 We know this is an issue of discussion, and I guess that's what we want to do, is
8 talk a little bit about it.

9 MR. PITTIGLIO: Well, let me just comment, and I'm sure Tim will add to it.

10 That issue has been identified to NRC. It is something that we are currently
11 looking at and trying to deal with. We do not at this time have a clear-cut policy on how to
12 address the changes to the LTP, and I am hoping that we'll get some input from the workshop.
13

14 We're looking at the safety significance of the issues.

15 One approach would be to try to identify some key areas in the actual license
16 amendment and possibly require submittal for approval before changes in those areas are
17 made.

18 However, that's just something under consideration right now.

19 MR. JOHNSON: Well, I think that's a good summary of what the issue is.

20 You know, whenever someone submits a licensing document that's going to be
21 in effect for quite a while afterwards, there are going to be changes that take place, and these
22 changes can be really minor to things of no significance at all to changes that are particular
23 significant, and in the license termination plan, we, you know, naturally have a range of possible
24 changes that could take place.
25

Some of them are very sensitive, some of them that are going to directly affect
the stakeholders, and they are probably going to want to be involved in reviewing some of those
changes.

So, there are probably going to be some things that we will want to make part of

1 the license itself. There are other things that we're probably going to allow changes under the
2 standard 50.59 change process that is applicable for reactors.

3 Now, what the details of that are, we haven't decided, and I guess we were
4 hoping at this meeting today we would get input from a number of people as to what they
5 thought was important and what they don't think is important, to try to give us their input into
6 helping us make this decision.

8 Are there any other comments on this from people outside of the industry as to,
9 you know, whether or not you've thought about this issue, any comments on where you'd like to
10 see this go?

11 MR. FULLER: I'd comment on that.

12 My name is Ernest Fuller, and I'm representing myself and Concerned Citizens
13 for SNEC Safety.

14 We feel that it's very important that all those things relating to safety and
15 residual radiation levels be clearly specified in the license termination plan when there is an
16 opportunity for public comment and those things not be changed without a further opportunity for
17 public comment, things like DCGLs, which are things that I think the public has some ability to
18 understand, if not their derivation at least their numbers, and when numbers and things like that
19 change to the public, it's important that they be allowed to comment on those changes, as well
20 as significant methods that might be used in terms of the work that may remain to be done and
21 area classifications in terms of particularly any change of areas from a higher level to a lower
22 level but also that there be a clear thing in the plan that shows how things will go from lower
23 levels to higher levels if inadequate characterization has been done before the LTP is presented.

24 It would be better to have a full characterization done first so that that can be
25 minimized as much as possible.

MR. PITTIGLIO: Let me just ask you a quick question.

Your position is that you would like to make sure that the public has an

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1 opportunity to comment on these changes. Is that correct?

2 MR. FULLER: Yeah, an opportunity to comment in a legal way, so that if it feels
3 aggrieved, that there is a process, a public process that it can go through.

4 The LTP is an opportunity to do that, and I -- it's sort of the last opportunity, and I
5 think one difference between this and sort of the operating reactor philosophy where you go
6 through 50.59 processes, there's always something that's going to come up again, where the
7 agency and the public will have another opportunity to potentially bring up an issue.

8 If things go the way they're supposed to go, when the license is terminated,
9 nobody is going to be looking at anything anymore, and so, the public -- certainly, I am very
10 concerned that, at that point, things really are known, exactly what's there, and they're safe.

11 MR. JOHNSON: Thank you.

12 Any other comments from other people?

13 How about Paul? Do you have anybody from industry that wants to say
14 something on that?

15 MR. GENOA: Yes, I do.

16 MR. ZINKE: George Zinke from Maine Yankee.

17 There's a lot of ways this can be approached, and in comparing to operating
18 reactors, sometimes you can establish margin of safety based upon numbers, and sometimes
19 you establish margin of public safety with regard to methods.

20 So, sometimes, you know, if a utility follows a certain method and that method
21 ensures margin for public safety, then changes to the method would be of importance, but the
22 results are just results from following the approved method that guarantees public safety.

23 So, as we look at what kinds of things could change or not change, some of the
24 things we've talked about so far are results of methods, and it becomes a little bit kind of a gray
25 of where are we going to be headed.

Two bullets on your slides dealt with that you wanted us to send a description of

1 the methods used to establish background radiation levels.

2 One said methods for ensuring sufficient data are included, but then as you
3 talked about those, you moved into you were expecting data, not just methods but data such
4 that, then, you are approving the method and approving the result, and that makes a big
5 difference to, you know, what level of detail we submit, makes a big difference to the change
6 mechanisms that we're talking about.

7
8 You know, are we going to -- are you going to be required to see every time we
9 change the result of a method that we've picked for either surveys or DGCLs, you know, any of
10 those.

11 So, there's a variety of ways of providing public input, but you know, one of the
12 concerns I have is sometimes, in our enthusiasm to get public input, we may get public input on
13 the same topic over and over and over and over, and we need to be able to have some closure
14 that we know, with one approval, public safety is going to be protected.

15
16 MR. JOHNSON: George, if you could kind of maybe expand on another area,
17 would you consider a dose assessment method -- in other words, the modeling method you use
18 to determine the derived concentration guideline limits to be a method, and if you change that,
19 somewhere down the line, that that would be something that you would want to come in for
20 formal approval of, or would you want the flexibility to change the models?

21
22 MR. ZINKE: Not being real technical in this area, you know, I probably won't
23 give you a real thorough answer, but if we could show, as a utility, that any changes in the model
24 could not reduce the margin of safety for public, whatever those things are, then it seems
25 reasonable, or if there was a threshold saying that, if you're changing the model and now, you
know, you pass this threshold which says you need to get NRC approval, if we had a system like
that, which 50.59 does pretty well for operating plants, if there was some threshold established, I
think that would be workable, but a threshold rather than just saying any change made into a
model has to have NRC approval.

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1 Now, I'm not smart enough myself to know how easy it is to establish those
2 kinds of thresholds.

3 MR. JOHNSON: Paul?

4 MR. GENOA: Yes. Paul Genoa, NEI, and perhaps there will be some others,
5 but just an initial thought would be, for example, if you establish that your decommissioning
6 approach is to do a green field, you're going to remove the buildings, there's just going to be --
7 any residual contamination left on the site -- that's going to be analyzed through a resident
8 farmer scenario, you're going to follow that scenario, you've identified the computer codes you're
9 going to use to assess that, and you turn in your LTP.

10
11 Three months from now, you get a revision, the guidance on the use of D and D
12 or RESRAD that says that the input parameters are X, Y, Z, water pathway, whatever, have
13 been changed, the assumptions found to be invalid or better data is available, you should use
14 this.

15
16 To me, that's a technical change that, you know, should be accepted without
17 needing a public comment revision period.

18 Now, perhaps if the agency comes out and says we have new guidance that
19 incorporates this and we want your input, here's an opportunity for public comment, well, that's
20 an approach, too, I understand that, and as I say, there are a lot of technical issues, and I say
21 technical issues, because as I say, embedded pipe issues and cracks and crevices and how you
22 determine concentration, and so forth, are issues that need to be addressed, but they don't
23 change the basic philosophy of calculating the dose to a potential member of the public.

24
25 Clearly, if you are going to move from restricted -- unrestricted to a restricted
decommissioning approach because of some information, well, that's a major change that the
public certainly would be interested in, but again, if the dose modeling changes, DCGL changes
result in minimal, whatever that word is, but you're dealing with that in reactor space with 50.59
all the time, minimal changes to dose consequences, we already know what the bounds of error

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1 are on some of these calculations.

2 I wouldn't expect that minor changes like that that didn't increase the dose
3 consequences in an unrestricted release in any significant way would require a public comment,
4 but you know, those are just my views.

5 MR. PITTIGLIO: Let me ask two quick questions.

6 One, on your submittal of the LTP, have you made any consideration about
7 maybe defining the parameters by which you would consider NRC approval versus what you
8 would -- may fall under the 50.59 process, for example, in your license amendment submittal?

9 MR. ZINKE: Yes, we've talked and considered, and I don't think we have our
10 answer yet.

11 MR. PITTIGLIO: Okay.

12 MR. ZINKE: Because it isn't a real easy question.

13 MR. PITTIGLIO: Let me ask you one more question, back to the issue on the
14 final survey.

15 At this stage, for your submittal of the license termination plan, do you
16 specifically intend it to find a survey unit or are you going in the approach of attempting to define
17 a survey area with a commitment to a size of a survey unit and a scan frequency?

18 MR. ZINKE: Let me ask the person who knows.

19 MR. PITTIGLIO: All right.

20 MR. FAUVER: Dave Fauver, RSI.

21 We're responsible for developing several sections of the Maine Yankee LTP,
22 including final survey plan, dose assessment, ALARA characterization, as well as sort of a
23 technical oversight role on the LTP itself.

24 We are proposing to use an approach of classifying broad areas as class one,
25 class two, class three, and not to delineate the survey units in detail in the LTP but to include
sufficient and detailed procedures as to how those survey units are going to be defined, what the

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1 areas will be, what the minimum or maximum areas will be for each one of these survey units for
2 structures and soils.

3 We're going to define explicitly whether it includes floors, lower walls, upper
4 walls, how those things would be broken down, because I think that's a little unclear in the
5 guidance when you look at DG 4006 and MARSSIM.

6 It says floor area, and I think that's just vague, because that could go all the way
7 up to the ceiling. That could include a large area.

8 I think that the key issue that's troublesome in this area is the idea of sample
9 density. If you stretch MARSSIM -- it can be stretched to absurdity. It's only a method that's
10 used for survey design, and those methods break down somewhere, and so, I think -- we
11 believe it's incumbent on us to give you something that you can see in terms of perhaps some
12 kind of reasonable minimum sample density.

13 Now, related to doing all this work up front to develop, you know, these survey
14 unit maps and all that kind of thing, another reason that we're not looking at that or we don't want
15 to do it is that it's not good staff loading, and we're trying to be efficient in our staff use, and we
16 have a certain number of rad engineers and people that are working on this project, and the way
17 this thing's rolling, their efforts are fully devoted to technical issues for the LTP itself, all these
18 other areas that we're working on.

19 When that ends and then you have sort of flow of work that goes along with the
20 decommissioning and we can use our same staff to start writing up the maps, developing the
21 maps, drawing it out, being more closely connected to the decommissioning work that's going
22 on, things may change, the order of the demolition may change, and the ability to get into one
23 area may become available more quickly than you thought, and so, that allows us, I think, also to
24 be more efficient in our staff loading and not to do all that up front, and I think if you can maintain
25 a commitment to a sample density, that all issues related to the survey unit size are resolved as
long as your procedures are clear enough as to the method you're going to use, and then it

1 becomes an inspection issue.

2 You come in, ORISE or an inspector comes in and looks at it and says, you
3 know, you've got two completely different areas here and this isn't making sense -- there needs
4 to be enough in the LTP, I think, to allow an inspector to do his job, as well.
5

6 MR. PITTIGLIO: In the LTP, the question I would have, then, just as another
7 one, would be, for, say, a class two area, not only would you -- would you intend on identifying
8 the size of the survey unit as well as the scan frequency?

9 Obviously, MARSSIM gives significant variation in the amount of frequency for
10 which you can do scan.
11

12 MR. FAUVER: Yeah, we're looking at that. I think that a general reasonable
13 approach is that, if you have a higher contamination potential, you should probably have a
14 higher scan coverage.

15 Lower contamination potential in class two, you might have a lower scan
16 coverage, and I think that, for our purposes, for our planning purposes and budgeting and
17 looking ahead, that we need to kind of know what we're going to do, as well.

18 So, I think we need to say something about that, and I haven't really said -- you
19 know, it's not clear in my mind how we're going to do that yet.
20

21 I hate to be real precise on, if there is one measurement above 50 percent, then
22 we do 75-percent scan or 50-percent scan, but I think some general guidelines need to be in
23 there, so that we don't default and do 10-percent scan in an area that's kind of marginal, class
24 two, class one.
25

MR. JOHNSON: Are there other comments from other people on the change
process and how you'd like to see changes reflected through time?

Yes, Lynn?

MS. GOODMAN: Lynn Goodman, Detroit Edison, Fermi I.

I'm definitely not an expert on license termination plans. We're now in the

1 process of looking at do we want to terminate our license.

2 From that perspective, in trying to make a decision on -- to go ahead into full
3 decommissioning or put it off another 20 years or so, the more rigor, the more difficult the
4 change process is going to be will give us more reason to say this is not the time to do it.
5

6 I really think the idea of putting the methodologies and criteria in the plan makes
7 sense and then having possibly in the plan the idea you've raised about having what will it take
8 to change the specifics.

9 It may be a little bit different for different types of licensees, whether you be a
10 large power reactor or material licensee, and I think in things like changing a specific instrument,
11 probably isn't something that needs prior approval, as long as you set up under what criteria that
12 you still have your accuracy well within your DCGLs and so forth, that you don't need a formal
13 change process.
14

15 But I think if you can, based on how you describe your methods, set up in your
16 plan what type of changes need what type of review and then maybe have some overlying
17 criteria that everyone will use, would be best, rather than just leaving it open to any type of
18 changes can put yourself open to the public review, meetings.
19

20 That just takes a lot of time and a lot of money, and the more we can just have
21 the methodology that we'll use for the specifics, as long as we keep up with that methodology
22 and maintain that methodology, that we don't need a formal change process and define what
23 would need a change process.

24 But the second point I wanted to make is I don't think 50.59 is the process to
25 use.

I really don't think the questions are the ones that will lend themselves to
whether or not those changes really will have the effect on whether or not the public interest
groups will want to review it or whether or not the NRC will want to review it for this type of dose
levels.

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1 MR. JOHNSON: Have you got some other method in mind other than, you
2 know, a 50.59 that might do what you think needs to be done?

3 MS. GOODMAN: I think possibly a different set of criteria that talks about what
4 is the potential impact of this change, the dose to the public after license termination, or possibly
5 questions that deal with -- actually, I haven't thought it out, so I'm not going to just go
6 extemporaneously, but I'd be willing to work with some group, if we wanted to get some working
7 group together, or if people just send in proposals on what should the criteria be, we'd definitely
8 have to participate on that.
9

10 MR. JOHNSON: Thank you, Lynn.

11 Any other comments?

12 MR. LITTLEFIELD: Pete Littlefield, Duke Engineering, Yankee Rowe.

13 Tim, going back to your question relative to the models, I'd like to reiterate what
14 Paul has said, that basically once we've identified the methods and the models, it would seem to
15 me that we ought to be able to change some of the input parameters without going through a
16 formal review process.
17

18 For example, if we were to go and collect data on soils on-site and get some soil
19 parameters that might be better than the ones we have taken for default, we ought to be able to
20 use those without a formal review process.
21

22 We ought to maybe even be able to take advantage of the work that the NRC is
23 doing in developing a probabilistic D and D and/or RESRAD models, when those come about,
24 without going through another formal review process.
25

So, basically, again, there has to be some way that we can adopt those kinds of
changes in our program after the license termination plan has been approved without a -- you
know, on some kind of a 50.59 type of approach.

MR. JOHNSON: Yes?

MR. ZANNONI: Good morning. My name is Dennis Zannoni. I work for the

1 State of New Jersey, but I'm being paid here to be here on behalf of CRCPD. So, I am wearing
2 two hats, but I basically have a question.

3 We haven't really looked at the question that you're posing right now about
4 what's the process if the LTP changes and the severity. I think some good points have been
5 raised for going in a variety of ways, but I don't know if anybody from DOE or EPA is here.

6 I mean the same thing happens when they submit changes, you know, and do
7 they have a process that's similar as far as what's required to go back to the public or what's
8 required to -- you know, to identify this issue, or is it just particular to --

9
10 MR. JOHNSON: I'm not sure that what EPA or DOE have is quite analogous to
11 what we're talking about here.

12 The issue that we have here is we're going to be approving a license termination
13 plan as an amendment to the nuclear power plant license, and part of the original assumption in
14 the rulemaking that established that as the way you approve a license termination plan was to
15 give public an opportunity to petition for a hearing and have input into how surveys are done,
16 what the criteria or residual contamination will be, and allow the public some input into that
17 process, because after all, the land that is going to be released is going to be released into the
18 public sector, so the public sector should therefore have some input into it.

19 Now, the -- now, what we have here is we've approved by amendment a license
20 termination plan.

21 Now, the license termination plan is a fairly complex document.

22 The methods and procedures that will be used to do the final surveys, the
23 models that would be used to demonstrate the derived concentration limits for individual
24 nuclides are not necessarily going to be simple, they're going to be complex, and through the
25 process, there probably will be a need for change due to different conditions or maybe someone
thinks this can be done better or a different way, but you know, as I mentioned before, the
changes can range from things that are critically important to things that, you know, have no

1 importance whatsoever, like with any process with a licensee, and I think what we would like to
2 do is try to develop a process that identifies things that we would consider sacred that would
3 have to go through a formal, perhaps, amendment process to change and things that can be
4 changed without going through that formal amendment process, and that's the issue, that's what
5 Paul has brought up.

6
7 We've had some discussions, you know, in meetings with licensees on this. We
8 really have not come to a conclusion as to, you know, how this should be done, and that's one of
9 the purposes of this discussion here, is to try to solicit feedback as to, you know, what is the right
10 process to do.

11 MR. ZANNONI: So, currently, until you develop some further guidance, it's the
12 50.59 process that would address any changes they would make to the license termination
13 plan?
14

15 MR. JOHNSON: Well, we haven't done that. 50.59 is really a process that was
16 developed more for operations and doesn't necessarily reflect the issues that we're talking about
17 here.

18 MR. ZANNONI: So, no process, then, exists.

19 MR. JOHNSON: Well, the 50.59 process is one that could be used, but I don't
20 think it completely is -- has been thought out or considered with the license termination plan
21 issues in mind.
22

23 MR. PITTIGLIO: One of the things that we clearly recognize is the fact that if --
24 once a license termination plan is approved and if the licensee stays within the bounds of that
25 license termination plan and makes no changes to it, that essentially was the last opportunity
that the public had to comment on the document.

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From then on in, once decommissioning is completed, the license is terminated.

So, we are concerned about the fact that, if there are changes made, how to
address it.

1 MR. CAMPER: Let me add a comment to that.

2 As I mentioned in my opening comments, I am fairly new to this program, but I
3 have been involved in other programs where we, too, have scrambled to develop guidance or to
4 update guidance on a host of materials use issues.
5

6 Something that strikes me at this juncture is, if I look at the license termination
7 rule and I look at the Commission direction to the staff at that time, which was to put the rule in
8 place and then aggressively pursue the development of guidance, there was clearly a -- there
9 was a need for the rule at the time, and the Commission recognized that the staff would have to
10 work aggressively to develop the guidance.
11

12 Now, my observation is that the staff has been developing a plethora of
13 guidance. I have a couple of concerns.

14 One is that the guidance is contained in a number of different documents,
15 number of different NUREGs, draft guides, and what have you, and -- but the point is, guidance
16 does exist.

17 Now, at some point, we'll need to ask ourselves whether or not we want to
18 consolidate that guidance in some manner, but that will be round two, if you will, because we're
19 still scrambling to get the guidance in place.
20

21 Now, the thing that I'm struck by and what I hear here is a couple of interesting
22 observations.

23 One is I think there's going to have to be some methodology for change to the
24 LTPs, and the reason for that has been alluded to already, and that is we are continuing our
25 efforts as a staff to make substantial changes to certain of the codes, D and D in particular,
RESRAD, those things -- some of the values in those codes are going to change, and we have
ongoing efforts with the Office of Research right now to try to look at some of those changes.

Some of the values in those codes are very, very conservative, and so, there's
going to be changes to those codes.

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1 I think that the interesting challenge for us is going to be, on one hand, it's to
2 address a concern, I think, that Mr. Fuller made that the public wants to be aware when sites are
3 making changes that impact that particular site, and on the other hand, the industry needs some
4 flexibility on technical issues where the changes are relatively minor when changes are made to
5 technical codes.
6

7 Now, for us to publish and make the public aware of changes to the code is
8 something that we certainly can do and would want to do.

9 I guess I would be interested in knowing a little bit more -- perhaps Mr. Fuller or
10 others -- if -- the reaction from the public in terms of whether or not that would be adequate.
11

12 If you assume for a moment that there will need to be changes made to an LTP
13 -- and I absolutely believe there will be -- if we were to publish the changes to the code, such as
14 D and D, RESRAD, and what have you, and then the reactor sites could make changes of a
15 relatively minor technical nature to adopt those changes in codes and the opportunity was
16 afforded to the public to comment on those code changes and what have you, would that be
17 viewed as being sufficient, then, as opposed to anytime a particular site made changes of a
18 relatively minor nature, particularly in this case, around the codes, that would have to be noticed
19 and an opportunity for public comment presented.
20

21 I'm curious as to whether or not that's a palatable process for you.

22 MR. JOHNSON: Pete, have you got any input on Larry's question?

23 MR. LITTLEFIELD: Well, I certainly would like to be able to take advantage of
24 any of those changes that Larry's talking about, and those are the ones that I'm talking about, as
25 well, when I talk about the probabilistic models and things, but beyond that, there are going to be
changes that I might like to make in input parameters to those codes as I get into the process.

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I may well discover things on my site -- especially if you're looking for an early
submittal of the license termination plan, I may well discover things relative to ground water,
relative to soil parameters.

1 Some of those will not have a great impact on the results of my analysis, and
2 there has to be a mechanism for me to adopt those kind of input parameters.

3 So, I guess my concern goes a little bit beyond the kinds of things that Larry was
4 talking about, where we're just -- we'd be able to take advantage of whatever the NRC changes
5 to the codes would be.

6
7 MR. PITTIGLIO: Let me just say one thing. I think you made a valid point in the
8 sense that you mentioned that, the earlier on, the more flexibility you do want in the change
9 process, or you need for it, and as I had mentioned earlier, we are encouraging the license
10 termination plan to be submitted as early as possible, and I think that's probably one of the main
11 reasons why we're having the workshop and wanted to bring this point up for discussion.

12
13 MR. FAUVER: Dave Fauver, RSI.

14 I think what Pete's saying is consistent with the guidance in 50.49 in the sense
15 that you start simple and you do this iterative process and you get more complex as necessary.

16 I think it's logical to start, for example, with characterization and say, all right, I'm
17 going to do this perhaps overly conservative assessment that's suitable for characterization
18 because it meets my detection sensitivity and I can live with it for measurement processes.

19 When you get into the cost-benefit analyses or the decommissioning itself, that's
20 when you start making your judgements about, well, do I need to spend money to look at certain
21 soil characteristics or ground water characteristics or certain modifications to parameters.

22 So, I mean it is part of the process, but in another sense, it's purely technical.
23 You're not changing any assumptions, per se, in the model. What you're doing is collecting
24 additional data.
25

 It seems that, if something can be set up to allow this technical process to
 unfold, without undue delays or, you know, problems in moving forward in that, then that would
 be logical to not have to go through a big change process.

 The NRC should have, somehow, an opportunity to look at that, it would seem,

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1 and it has to be reasonable, and you know, Pete said, well, some of these things might not have
2 a big effect.

3 Well, if they don't have a big effect, we probably won't spend a lot of time on
4 them.

5 So, the ones that we really are concerned about are the ones that do have a big
6 effect, in reality, and so, you're not going to mess with it too much to get a 10-percent change, or
7 15, but some things may have a doubling effect, or whatever, on your numbers.

8 Nonetheless, I can envision this effort simply being collecting the data.

9 Well, that's not a big profound issue in terms of just technically going and getting
10 data in a model that's already sitting there and it's just changing an input parameter, but it could
11 cost money to do, and that's why you delay it to the end, and I certainly agree with the idea of
12 being able to use emerging guidance that goes through NRC's review process and new models
13 and new RESRAD default models and all this.

14 I mean that has to be put into place without causing some big change process.
15 Otherwise, people will delay.

16 You know, like Lynn was saying, well, we would have to wait to see this whole
17 thing unfold, and that's something that's going to slow people down if there's not a mechanism
18 for doing that.

19 So, these purely technical -- the evolution of the refinement of your dose
20 assessment process seems like something that should be -- licensees should be able to do
21 within the structure of the approval.

22 MR. CAMPER: The gentleman over here, and then Paul has a comment.

23 MR. TARZIA: Thank you. My name is Jay Tarzia. I'm the health physics
24 manager for the decommissioning of the Connecticut Yankee site, and I'd like to reiterate some
25 of the comments that my peers here have brought up.

I think that we're in the very early stages of this whole license termination plan

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1 process, kind of like where we were 30 years ago with final safety analysis reports, where I don't
2 think we were very -- I don't think we envisioned the FSAR back then to be such a living
3 document in that it would be going through the number of changes that we have determined it
4 needed to over the years, with the guidance that unfolds when new technology and so forth
5 comes up.
6

7 I think it would be shortsighted to think that the license termination plan is not
8 going to be a living document, that we're going to be change probably many times throughout
9 the number of years that we go through decommissioning.

10 With that said, I think that we need a very clear method for changing the license
11 termination plan. However, it will take, I believe, a long time for us to come to some consensus
12 on a very universal change method.
13

14 I think one of the things I would like to propose is, in the interim, that maybe
15 facilities can actually provide the screening data in the LTP that would act as the change method
16 for each individual site, because I do think, as one of the other individuals spoke of earlier, that it
17 is going to depend on the type of site you are, with the -- that really dictates the change method
18 that you need.
19

20 For instance, even DCGLs -- it maybe very appropriate for a site that uses one
21 or two nuclides -- thorium uranium facilities, perhaps -- to go through a very simplistic method to
22 develop the DCGLs and put them in the LTP, and then, if they change, they need to go through
23 a formal change, because they know what their nuclides are, and they know very clearly what
24 the concentrations are from the get go.
25

For power reactors, we're unfolding different mixes every time we uncover -- or
open up a system.

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So, our DCGL mix is going to change, and we need to specify the method to
develop those sorts of values, and it would be very unrealistic for us to have to apply for a
change in DCGL every time we come up with a different mix.

1 I mean, for the Connecticut Yankee site, we'd probably have 100 different
2 mixes, ranging from beta to alpha ratios from 500-to-1 to 4-to-1. So, our DCGLs are going to
3 change dramatically when we open up systems as we proceed through decommissioning.

4 So, you know, we would be submitting changes -- formal changes all the time if
5 we had to get to that level.

6 I think a screening criteria much like a 50.59 screening form, with the
7 appropriate questions submitted in your LTP package that's approved by the NRC, would be an
8 appropriate way to go initially.

9 Now, saying that, I also think that, if the NRC changes guidance over the years,
10 we should not have to submit a change to our LTP to accept that guidance.

11 We've changed 10 CFR 20. The public's had ample time to comment on the
12 regulation, and then the NRC puts out their reg guides and their guidance documents.

13 Well, the licensees, historically, have not had to apply for permission or approval
14 to use the new reg guides, and I think, if the NRC goes through the process with the public to
15 comment on a change in process and it's approved by the NRC, the licensees should be able to
16 use that and adopt the current guidance that the NRC puts out.

17 I think that's historically what we've been doing. It's been safe, and it's also
18 provided a very adequate margin of safety for the public.

19 MR. JOHNSON: Okay. Thank you.

20 Paul?

21 MR. GENOA: Yes. Paul Genoa with NEI.

22 I wanted to kind of tie a couple comments together very briefly and try to kind of
23 simplify the issue, and that really has to do with is the change -- and I think we agree that there
24 will be changes over time -- is the change significant and should the public have an opportunity
25 to comment on it, and I clearly understand that if there is significant change, they should have
that opportunity and we ought to develop that mechanism, but the way I look at it, we have to

1 meet a certain standard to decommission these plants, and a licensee will identify up front what
2 the dose number they're -- what their target is, you know. Are we going for restricted or
3 unrestricted?

4 Once we decide that, if it's unrestricted, how much margin are we going to give
5 ourselves? Are we shooting for 24.9? I don't think so. We're going to shoot for a value, and
6 we're going to work backwards from that value that gives us sufficient comfort.

7 Now, as Dave was pointing out, we're all engineer-type people, and so are you,
8 in developing these rules. We're technical people. What we're talking about here is using the
9 simplest approach possible to assure everyone that we are going to meet that target value.

10 Now, as you move through the process, you may determine, as we do in many
11 engineering things, that you need to sharpen your pencil, you need to go in and work a little
12 harder to understand the input values you're using and how much conservatism is built into them
13 and where they need to be adjusted and fine-tuned, and that is a common situation, and that's
14 exactly what your guidance documents tell us to do, an iterative approach, working our way
15 through it, removing conservatism as is necessary.

16 It doesn't change the end dose value, and I guess that's the point.

17 If you're making changes in your LTP and in your approach but the change
18 doesn't really affect the end result, it's a mathematical permutation that you're changing. You're
19 sharpening a pencil. The data you're putting in is more realistic, more accurate.

20 So, it doesn't actually change the value, at least from my perspective. That's
21 one way to look at it.

22 Thank you.

23 MR. JOHNSON: Does anybody want to comment on that?

24 MR. MEEK: I'm Tom Meek from Portland General Electric, Trojan.

25 I kind of want to go back to the first question that was asked. That had to do
with why there would be a lot of detail or we might not be able to define all the survey units and

1 the LTP when you send it in at least two years in advance, and the reason is that that part of the
2 cost review you do as you're actively performing decommissioning, you may make decisions to
3 change buildings. You may change the process you're making in a room or a building that will
4 remove a survey unit or break a room down into more than one survey unit.

5
6 Our example at Trojan is we are making decisions now whether we'll leave any
7 containment concrete other than our containment building standing.

8 So, if we leave the containment building internal concrete structure intact, there
9 will be a lot of survey units, and we'll define probably five or six survey units just in that concrete.

10 If we remove it all for cost-effective decommissioning, there will be no survey
11 units there. So, trying to define that at this point, a couple of years in advance, it's very difficult
12 for us, and that's true throughout the various buildings.

13
14 We may remove walls to remove equipment. If the wall is gone, a part of our
15 survey unit changes, and we need to be able to have that flexibility to change those things.

16 For the change criteria, we did submit an LTP, and we have submitted what we
17 think are some reasonable approaches to take to making what requires prior approval, and I
18 didn't bring those with me, and I can't remember them off the top of my head, but we're also
19 really interested in what other people are thinking about that, and if there are some better ideas
20 out there -- those were just what we came up with on our own, and we'd be more than willing to
21 listen to what other people have and maybe use that, also.

22
23 MR. PITTIGLIO: Thank you.

24 If we don't have anymore questions --

25 MR. FULLER: I thought I was asked a question, but -- and to answer it, I think
one thing that's important in all of this is to have better characterization before you submit a plan,
so you don't have to make so many changes.

I think the addition of data, as you were suggesting, to make things more real is
an improvement in general.

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1 So, instead of using assumptions where you produce real data, that's an
2 improvement and that's something that should be encouraged, but playing around with
3 assumptions in the middle of the process is something that makes me nervous, and of course, I
4 think if you change your generic guidance, anyone is going to be able to use that. I don't see
5 how you can avoid that.
6

7 However, there's a real problem for the individual plant, which gets back to the
8 answer to your question. Most people at an individual plant are not interested in what's going on
9 with decommissioning until decommissioning happens. Then there will be some process with
10 the LTP approval where people will be involved with that.
11

12 People at particular plants don't really know what's going in Washington with
13 generic things that are happening, and if there are generic things that are happening that are
14 going to affect that license termination process, the NRC should take the responsibility to go out
15 and talk to the people at that plant about it, because it's not fair to assume that we're --
16 lay-people are going to keep up with all the changes that paid people can't keep up with.
17

18 You know, there needs to be a process, a public process where, if there are
19 things that are going to change, that the NRC is making those changes, you need to go out to
20 those specific plants and let people know about it so they can make a comment and whether it
21 should apply to that plant or not, or get their reactions to the process, because they're the ones
22 who have taken more of an interest in the decommissioning parts of things and, hopefully, will
23 be able to give better advice.
24

25 MR. CAMPER: Thank you for that.

 I have a question for you, Tim.

 You went through a litany of things, a number of parameters, and we're new at --
we're still early in the game yet, so we haven't had time for a lot of lessons learned, obviously,
but as you look down through the list of things that you stepped through, what do you believe to
be the most difficult issues that the sites are going to have to deal with and why?

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1 MR. VITKUS: From what I've seen so far, I think it's mainly going to be how to
2 apply the -- mainly for multiple contaminants, how to apply the DCGLs for survey planning and
3 designing scans.

4 If you have a contaminant with a much more restrictive DCGL than its
5 companion, then, you know, obviously there you're going to probably have to design your scan
6 around that more restrictive contaminant.

7 It leads into a whole number of issues.

8 If you have a hard-to-detect contaminant, which normally isn't going to have a
9 restrictive DCGL -- I mean the hard-to-detects are usually ending up coming up relatively high
10 numbers, but it still leads into an issue of whether you design around your scan MDC or -- and I'll
11 have some more of this tomorrow in the slides I'll be presenting, be going into a little bit more
12 detail. I'm just kind of talking off the top of my head, but I think that's one of the main things
13 that's going to come up, is how to handle the multiple contaminants in the DCGL survey design.

14 MR. CAMPER: Any thoughts or comments on that to help Tim as he factors into
15 his talk tomorrow? Any preliminary questions or ideas?

16 [No response.]

17 MR. PITTIGLIO: All right. Thank you.

18 We'll now go on with the next presentation.

19 I'm just going to take a brief few minutes and give an overview of some of the
20 lessons learned from Shoreham, Fort St. Vrain, and Yankee Rowe related to the final surveys.

21 While we recognize the final surveys were conducted under 58.49, basically the
22 items that we identify are typically something that would probably come up under any survey,
23 and I also want to make sure that you understand that there were other lessons learned we
24 learned from those particular decommissioning projects, but the focus of this talk is simply on
25 final survey lessons learned.

First slide, please.

1 The bullet is inadequate description basis for the survey classification.

2 You know, when we looked at many, many survey packages, especially in the
3 early planning or the early review of the sites, the basis for the historical site assessment, as we
4 now call it, just was not complete and wasn't adequate.
5

6 So, we wanted to point that out. I mean that's going to be a key factor in your
7 survey package, under your description for the classification.

8 Another thing that we noticed when we looked at the survey packages was an
9 explanation for conducting investigations and results of investigations were missing or
10 inadequate.
11

12 We might see an elevated number or we might see something that notes that an
13 investigation was conducted, and then when we try to search through the package to find out
14 what the results of the investigation was, we weren't able to track it.

15 So, when you do some additional investigations, it's important that the package
16 identifies what it is and it's easy to follow through.

17 Third bullet was the survey package did not identify survey instruments and
18 calibrations. That's a key point when we go back and we look at the measurements. We looked
19 at some of the packages and we couldn't tell what survey units were used, and so forth and so
20 on.
21

22 Again, all of these bullets were typically something that we saw from all three of
23 the surveys. They were typically identified early on, and obviously, as we went on through our
24 process and our in-process inspection process, the packages and the significant corrections
25 were made.

Next slide, please.

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Some of the survey packages when we looked at them -- the sign-off was
incomplete or the dates and signatures were missing or some of the dates that would identify --
if you looked at the procedure on who signed off and when, there was a certain procedure, and

1 we'd look at the dates in some of the packages -- the final person signed off before the -- you
2 know, it was an inconsistent approach in the sign-off of the package.

3 Survey package reference traceability -- the survey record was sometimes
4 inadequate or missing.

5
6 Typically, what we had on the survey package was a survey package that was a
7 summary, it provided data, it was submitted to us as part of the final survey report, and the
8 survey -- the major part of the record was kept at the site. A whole lot more information was in
9 the survey record.

10 What we would randomly do would be to review some packages, and when we
11 went up to the site on an in-process inspection, we would go take that package and go back and
12 see if we could trace it to the survey record, the complete record that supported all the
13 information, and typically, what we found, especially early on in the survey process, was that it
14 was very difficult to trace it back to the full record. So, we wanted to identify that.

15
16 Some of the survey -- the next bullet -- the survey summary sheet data in the
17 package was insufficient to confirm the package met the criterion.

18 Obviously, what we would see was a summary table in many packages, but
19 make sure that the summary table provides sufficient data from which we can make a
20 judgement call against.

21
22 And finally, the last bullet, we did see significant improvement in the process as
23 we conducted our in-process inspections.

24 We really implemented the in-process approach at Fort St. Vrain after learning --
25 from Shoreham and the importance of being there early on to identify these issues in the very
beginning so that corrections could be made rather than identify them late in the process and
then having to have the licensee make significant changes to the package.

So, I do want to point out again that we did see significant improvement as time
went on, but please bear in mind that these items did occur, they seemed to reoccur, and that

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1 there's something that you should keep an eye on.

2 Any questions?

3 MR. JOHNSON: Let me put some perspective on what Larry has just gone
4 over.

5
6 The discussions Larry is talking about relates to the actual surveys that were
7 conducted at some of these plants that were done prior to the implementation of the new license
8 termination rule and the implementation of the MARSSIM document.

9 So, what we are faced with now is a whole new set of implementation problems,
10 because we're implementing new regulations and new survey procedures, but I think the
11 comments that he made are still going to be applicable when licensees get into actually
12 performing surveys to the procedures that they've indicated that they will use and would
13 eventually be approved in a license termination plan.

14 Paul.

15 MR. GENOA: Yes. Paul Genoa, NEI.

16 I agree with everything I have heard here, and I understand that it works, and I
17 think the industry does, too, as it matures, it's addressing these issues, and I think there is an
18 exciting story out there related to that.

19 As we move into this area, various licensees are starting to explore a variety of
20 electronic databases to develop those survey packages.

21 These databases have the tendency to remove some of the human error. They
22 tend to force the input of data that's necessary in required fields and validate it, force it to occur
23 before you can move on.

24 So, they tend to ensure that some of the discrepancies that you point out, like
25 sign-offs in the wrong order, can occur.

Now, different people are developing this at this time, it's an emerging issue,
and I guess, as we look forward, I would like you to consider, if there are opportunities for

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1 electronic submittal, what form it should be in.

2 That would simplify the receipt of this data for processing of it, because it
3 certainly makes it easier on developing it, to organize, review, and analyze this data.

4 MR. JOHNSON: Well, I'm not sure that -- not everybody knows what's going on
5 within the agency, but there is a new document management system that's being put in place
6 that is all electronic.

7
8 The intent is to take our agency out of being paper-based to being
9 electronic-based. So, we're going to be, in the future, asking for submittals to come in
10 electronically, they're going to be managed internally through an electronic system, and be
11 available to the public electronically.

12 So, that's where the agency's going.

13 So, I'm glad to hear that that's something the industry is also moving towards, as
14 well.

15 MR. CAMPER: And of course, it will be a seamless transition, with no problems.

16 MR. PITTIGLIO: Let me also point out that many of these items that have been
17 identified were items that occurred early on, and in many cases, we looked at, you know, draft
18 packages, but they are items that I consider action items.

19 Whenever we go up to the site to do an in-process inspection on survey
20 information, we keep these things as items in our back pocket. We're always looking at them,
21 because they historically have been issues, and that's why we wanted to just identify them to
22 you.

23 MR. JOHNSON: Larry, I'm not sure that everybody understands the term that
24 you've used, "in-process inspection." Could you kind of reflect a little bit about what that is and
25 the process that we're using for conducting confirmatory surveys?

MR. PITTIGLIO: Yes. Thank you, Tim.

As a result of the final surveys that we conducted at the Shoreham nuclear

1 plant, which were really conducted -- the confirmatory surveys were conducted after the licensee
2 had completed the final surveys.

3 We picked up discrepancies in instrumentation and calibrations and so forth that
4 resulted in a lot of time and effort on both parties to resolve the differences.

5
6 As a result of that, the NRC went back and implemented what we called an
7 in-process inspection, and what that means is that the NRC, with the help of ORISE, has gone
8 out to Fort St. Vrain and, for example, to Yankee Rowe, very early on in the final survey process
9 and very initial stages of setting up the final survey and taking initial measurements.

10 We went out at Fort St. Vrain over a two-year period probably eight different
11 trips. I believe ORISE and myself have made four trips up to Yankee Rowe.

12 The purpose of what I call, quote/unquote, "in-process inspection," is to be out
13 there in the very initial stages to take side-by-side measurements to make sure we have
14 compatibility of equipment, instrumentation, and so forth, and to identify any issues that may
15 occur very early in the process so that it doesn't result in delays in the license termination or at a
16 significant cost to the licensee.

17 So, what the -- the definition of the in-process -- what I call in-process
18 confirmatory survey is to be out there very early in the process and to be out there with the
19 licensee and to identify issues.

20 MR. JOHNSON: Are there any comments on this or other points or lessons
21 learned that people are willing to talk about or discuss?

22 MR. CAMPER: In particular -- I don't know if there's anyone here in the
23 audience that were at any of these particular facilities at the time these surveys were done or, for
24 that matter, if the regions have any observations under lessons learned for these sites.

25 [No response.]

MR. CAMPER: Anybody in the region care to comment on any of the lessons
learned?

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1 [No response.]

2 MR. CAMPER: Okay. Well, hearing nothing else, it's about 10:08 according to
3 my Mickey Mouse. We're due for a break at 10:15. Unless anyone has any objections, we'll
4 take a break just a little bit early, and we're due to start again at 10:30.
5

6 [Recess.]

7 MR. CAMPER: Why don't we get started, so we can try to stay on something
8 that resembles a timely schedule?

9 I do want to mention at this moment that we've had a request -- there's been a
10 couple of, I guess, additional thoughts or questions on issues that we were discussing in the last
11 session or sessions, and what we'll try to do -- Larry tells me he's confident that we squeeze in a
12 little bit of time prior to lunch and yet stay on schedule, so we can all be back by 1:00 to see the
13 Chairman, and we'll afford an opportunity there, then, after the last morning session for
14 additional thoughts or questions or expression of issues from the earlier sessions, and let me
15 say again I'm very glad to see that I've got some people at the table now.
16

17 I'm accustomed to being at workshops with the medical community and the
18 industrial radiography community and people are at the table and jumping up and down and
19 throwing things at me.
20

21 So, it was a little too quiet and peaceful for me this morning. I was getting very,
22 very nervous. It's good to see people at the table, and again, I would encourage -- there's still
23 some spots. I would encourage others who might have other views to come to the table so we
24 can have some good dialogue.
25

Go ahead, Larry.

MR. PITTIGLIO: Good morning again.

I would like to introduce Tom Fredrichs, who's going to give us a presentation on
the change process. It seems that changes are always an interesting topic.

Tom?

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1 MR. FREDRICHS: Thank you, Larry.

2 MR. PITTIGLIO: By the way, Larry, I can throw something at you if you will
3 make you feel a little bit more comfortable.

4 MR. CAMPER: But they don't work for me, see. You do. That's the problem.

5 MR. FREDRICHS: I'd like to thank my colleagues in NMSS for asking me over
6 here to get some comments and views on releasing a portion of the site property.

7 I'm in the decommissioning section of NRR, and I've been asked to look at this
8 from a longer-term perspective to try to formulate some policy for the Commission, and right
9 now, of course, Oyster Creek is a current issue with releasing part of it.

10 I'm not going to address that specifically, although, you know, how the agency is
11 handling that hopefully will be consistent with our longer-term proposal, and I'm calling this
12 approval -- release before approval of the license termination plan, because we believe, once
13 you come in with the LTP, if you want to have some sort of staged release of areas, we can
14 probably handle it under that, and just to give you a little preamble.

15 The overview of what I want to cover, the purpose that hopefully we can
16 accomplish here, a statement of the issue itself, the general approach to forming the policy,
17 some position development, and here there's a number of areas where I am particularly
18 interested in comments and suggestions, and then a framework, a way to look at this, to kind of
19 guide ourselves as we're forming a policy.

20 The purpose of this talk is primarily to obtain some stakeholder views and
21 interest at the beginning of a policy development.

22 Right now, we don't have a partial release policy for reactor sites. So, we need
23 to form one, of course, and these areas of interest -- they're mainly -- I'm trying to generate some
24 comments so that we can take those and consider them when we are developing our policy.

25 The background on this is that we have some licensees that have expressed an
interest in releasing a portion of their site in the near term and, in particular, before the license

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1 termination plan is approved and, in some cases, before you would even expect to think about a
2 license termination plan if you're an operating reactor.

3 The real issue is that we don't have provisions in Part 50 for a partial site
4 release, and we need to develop something for that.

5 The general approach that we, I guess, like to take -- we have four regulatory
6 goals that we're trying to achieve as we change our policy.

7 Maintain safety, of course, which we always did -- we are trying to reduce
8 unnecessary burden, improve efficiency of the agency and to maintain public confidence.

9 We want to use existing regulatory processes wherever possible rather than
10 trying to invent new processes.

11 For example, in sampling and surveying areas that you might want to release,
12 we would want to use established guidances -- for example, the MARSSIM -- rather than come
13 up with new methods or protocol, and we want to apply this to both operating and
14 decommissioning reactors, because -- well, both kinds of licensees have expressed this interest.

15 So, to get along that road, this is one form where we can solicit stakeholder
16 views and comments and then take them and consider them as we develop the policy.

17 Some of the areas where we're especially interested in some input -- for
18 example, the amount of NRC oversight -- there's a spectrum of concern from areas where,
19 clearly, it's non-impacted, there never has been any radioactive material on it, and there's no
20 effect on reactor safety or public safety issues.

21 In cases like that, the amount of oversight for NRC is not an awful lot, and you
22 can imagine the other end of the spectrum, where remediation may be required or there might
23 be a question of reactor licensing basis or safety, in which case some form of NRC approval for
24 the change would be appropriate.

25 We're also looking for the appropriate release criteria, and it seems -- in a way,
it seems like, well, probably we need Subpart E of Part 20, which is the license termination

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1 criteria, but that's not necessarily straightforward for an operating plant, because there are other
2 parts of Part 20 that might come into play that we'd have to think about -- the waste disposal
3 limits, the survey limits.

4 Traditionally, we have applied a no-detectable-activity criteria for solid materials
5 leaving a power plant for unrestricted area.

6 That's not necessarily going to be the case with soil, and Appendix I for
7 effluence could potentially limit the amount of dose that would be allowable in some sort of a
8 partial release of a site.

9 We're also interested in the impact on license termination, partly because if
10 there is a dose associated with an area, it might be one or two or five millirem a year.

11 The question is, later on, when you do terminate the license, how does that
12 affect the 25-mill-a-year limit? Is it 25 minus what you've already released or something else?
13 And your comments on that are things we're searching for.

14 Also, it may be appropriate to maintain records of property releases so that
15 when the license termination plan does come up and questions may come up, well, how did you
16 dispose dispose of that land, you can pull it out of your records and say here is what we did.

17 We're also considering what sort of regulatory mechanisms might be
18 appropriate to handle these cases. In some cases -- to the extent that the NRC would need to
19 approve some action on the licensee's part, should that be by a license amendment or should
20 we send a letter or something else?

21 We've also found that, in considering some of the actual cases that are coming
22 up, some of the definitions in the regulations become a lot slipperier. The site boundary is one
23 of them. That is no longer as clear as it used to be.

24 It doesn't necessarily have to be the property boundary. It doesn't necessarily
25 have to be the exclusion area. So, we need to define some of that, and your views on that
would be very helpful to us.

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1 Then there's the use of 50.59, which has kind of become, I guess, a regulation
2 for all purposes, in some ways, for every change.

3 We need to understand that 50.59 was originally intended to look at licensing
4 issues associated with reactor safety. It wasn't really intended for environmental issues,
5 although obviously it can be read that any change to the facility could be handled under this.
6

7 But there are some issues that may not be captured by 50.59, and a decrease in
8 the effectiveness of emergency planning or physical security, for example -- they're actually
9 covered under a different regulation.

10 You may need changes to your off-site dose calculation manual, with changes in
11 where you calculate the concentrations at the site boundary, and there are also some public
12 information and environmental concerns that really aren't captured in 50.59 because they don't --
13 they're not unresolved safety questions, you don't need tech spec changes, but there's still a
14 concern.
15

16 And we're also looking for views on public information.

17 One idea is that we could have a public meeting in the vicinity of the site when
18 these releases of portions of a site are carried out, and the purpose would be basically to
19 present information on the process used to assess and release the property, so that the public in
20 the area knows what's going on and knows what we've done to make sure that the environment
21 and the public is being protected.
22

23 I've come up with a framework. I tried to boil it down to a couple of essential
24 questions to sort of guide the way we think about this as, you know, many details come up and
25 we try to resolve how to answer some of them.

We broke it down into basically two questions. One is the reactor and public
safety question. The other one is the property itself -- is it radiologically impacted or not? And
these conclusions would be based on a licensee evaluation.

And in thinking about that spectrum from less oversight to more oversight, in the

1 box on the upper left, where we know it's radiologically not impacted, we know that there's no
2 safety issues involved, it probably would be appropriate for NRC just to do an inspection of the
3 licensee's evaluations and, if we find them adequate, document that in an inspection report, and
4 that would probably be the extent of the oversight.

5
6 If you get down to the lower righthand box, where there is a safety issue or there
7 is radiological impact -- well, there are both of them in that case -- an approval is probably
8 appropriate, and safety generally requires an NRC approval, and the case where it's
9 radiologically impacted, we are right now thinking perhaps an approval would be the way to go,
10 but we're open to suggestions, so I welcome all your comments.

11 That's pretty much the presentation.

12
13 MR. CAMPER: I have a number of comments. I want to try to put this issue in
14 context.

15 I think that, as has been presented, which is a very accurate depiction, that we
16 don't have a established process for partial releases in terms of it having been clearly articulated
17 in the regulations perhaps to the degree that we would like, and we are thinking about that and
18 we are beginning to work on it, but as is often the case in the regulatory arena, there will be
19 forcing functions that will cause us to have to deal with a particular situation prior to having in
20 place the clearest articulation that we would like so that everyone would understand what to do
21 about a particular issue -- in this case, partial release.

22
23 By that I mean that we have a site that we are currently under discussion about.
24 We've had a series of management discussions and recently a number of interactions with the
25 Office of General Counsel. In fact, just as recently as yesterday morning, we were in a meeting
on this topic.

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We have a site that is interested in selling a portion of its site and having the
land released for unrestricted use.

Now, this is an emerging issue, obviously, on the reactor side of the house, but

1 for those us who spend some time on the materials side of the house, it's pretty standard fare.

2 We often review and react to and release portions of material sites.

3 Now, there are some fundamental differences in the licensing process involved
4 in terms of the definition of a site, the site boundaries, and those types of things, that comes into
5 play, but as was pointed out in one of the bullets here, as we've gone through our discussions
6 over the last few days, one of the things that we keep coming back to is that the basic principles
7 and process, in fact, do exist and have been used successfully in a number of releases on the
8 materials side of the house, and so, the idea of relying upon existing regulations or processes --
9 we believe the basis is there -- Part 30.36, in particular, and Part 20, Subpart E.
10

11 Now, we are in the midst currently of preparing a response to the particular utility
12 in question, setting forth our position, but as was pointed out, a couple of baseline principles
13 need to be brought to bear.
14

15 Obviously, we have to determine that the site is suitable for public release, and
16 there's a number of steps involved in that process.

17 We have to ensure that whatever dose contribution there might be at that
18 particular portion of the site is brought to bear when you consider the 25-millirem limitation for
19 the site at the time of ultimate termination of operational activities.
20

21 So, what we're going to do in short order, because there's a time constraint --
22 there is an interest in this particular utility to sell their piece of land in fairly short order -- we're
23 going to be preparing a response going back very soon, and I'm not going to put out the details
24 of all that response at this point, because we need to get it worked through the Office of General
25 Counsel and management and what have you and we need to coordinate closely with the folks
in NRR, but in general terms, I will tell you that we do believe that a process is in place, that the
mechanism generally involved, Part 30.36, the requirements there, Part 20, Subpart E criteria,
and that the underlying principles in terms of ultimately releasing a site, whether it be a portion of
a site or the entire site, the same principles apply in terms of ensuring that the site is suitable for

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1 public release, that the dose constraints in Part 20, Subpart E are met.

2 So, I wanted to point that out as a matter of context and point out that we do --
3 while we're working toward developing a clear regulatory position, there's no question in
4 anyone's mind, as we all look at Part 20 or Part 30, where it talks about termination of license
5 activities and what have you, it's very clear.
6

7 My impression, looking back at it now, is that the issue of a partial release and
8 its impact on decommissioning certainly wasn't articulated at the time of those regulatory
9 adjustments.

10 It may not have been thought of, or if it was thought of, it certainly wasn't
11 addressed, certainly, in either regulatory language or, for that matter, necessarily within the
12 statements of consideration.
13

14 So, it's an emerging issue, and we have a forcing function.

15 So, we're going to have to develop this policy probably quicker than we had
16 anticipated doing it, both for the immediate issue at hand and, in general terms, for the industry
17 at large.
18

19 That's it.

20 MR. FREDRICH: Paul?

21 MR. GENOA: Yes. Paul Genoa, NEI.

22 I do have a few introductory comments, and then, as you can see around the
23 table, we have several different utilities represented that have an interest in this issue, and they'll
24 be able to articulate that, and recognize that different people are motivated to do things for
25 different reasons, and they'll get into that a little bit.

I think it's important to put this all in context, and I think the presentation sets
that stage very well.

When you look at the table that is on page nine, under reactor public safety, you
see some of the reasons why reactors are unique and why they, in fact, have a large buffer zone

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1 surrounding them.

2 During the operation of a power reactor, the design and construction and the
3 acquisition of land, they've had to deal with several issues -- emergency planning issues, the
4 effluent release issues, and so forth.

5 So, there was, in fact, this design for a large buffer zone around a power reactor.

6 Now, logically, when you shut down that facility, those shrink or go away over
7 time, and so, there is a logical motivation to be free to release those lands that, in fact, are likely
8 unimpacted, but of course, obviously, for the safety to the public, meeting those criteria need to
9 be met.

10 But I guess the point is -- and I think you made it very clear that the LTP process
11 provides an opportunity for that, but in fact, that may be fairly late in the process, and it may
12 unduly delay the transfer of that land for other purposes that are desirable by society and by the
13 local citizens around that facility.

14 Also, the needs are different among different people. Some mechanisms
15 provide -- may allow release, but other mechanisms may provide a better legal transfer and
16 provide more comfort for a certain due diligence process that goes on with land is transferred.

17 I think another advantage and uniqueness to the reactor side is that, while we
18 have those large buffer zones during the operation of the plant, we have, in fact, in place both a
19 pre-operational and a post-operational environmental monitoring program.

20 So, in fact, the environs around that plant are well-characterized radiologically,
21 prior to operation, and were continuously monitored during the operation of that facility.

22 All that material and all that information is public record and provided to the NRC
23 to show what the potential impacts are in that buffer zone.

24 So, this is not an unknown area. Matter of fact, it's already monitored and would
25 be a relatively straightforward process to assure ourselves that the public is being protected
during the transfer.

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1 I guess the question is we understand a desire for public involvement in those
2 kind of discussions and that process, and we ourselves are looking for the appropriate
3 mechanism and opportunity, after the termination of operation and perhaps prior to license
4 termination plan submittal and approval, to identify an opportunity to make the plan available.
5

6 So, those are my general comments.

7 MR. FREDRICHS: Yeah, George.

8 MR. ZINKE: George Zinke, Maine Yankee.

9 I wanted to talk a little bit about some of the aspects of this subject, and it's true
10 that, for those of us that are in license termination and going to process a license termination
11 plan, that does provide us a vehicle to address this, but as yet, we don't have guidance or too
12 many hints on what kind of a process should we describe in there that would be acceptable.
13

14 For Maine Yankee, some of the issues that we get into is license -- the license
15 termination process ends with license termination, and that is a very -- that's closure. It's final.
16 Once you get there, it's kind of like you're free and clear.

17 You're not going to have somebody a year after license termination that says,
18 oh, I want to take some more surveys or I want to do this or -- you're done, and what we are
19 looking for a process on release of lands early is that same kind of finality.
20

21 So, we're not looking where, well, you can release the land but you're really not
22 going to terminate the license for 20 years, so 20 years from now maybe you'll have to go do
23 some surveys.

24 In order for us to sell property, we need to be able to sell it that the license has
25 been terminated relative to that piece of property.

So, that property would be treated no different than like a gas plant that
happened to be located next to a nuclear plant independent of when each one was built. It has
to be that final.

So, in looking at your last slides, things that, I think, need to be considered in the

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1 radiologically non-impacted under the public safety not affected, I think it would be nice to be
2 able to do that with NRC inspection, but typical NRC inspections will conclude that, within the
3 scope of the review, everything looked okay, but it doesn't provide any legal closure, and NRC
4 always makes up front saying this doesn't constitute approval, just says that based on what they
5 looked at, looked okay, but we may change our mind some other day.
6

7 So, that typical answer out of the inspection process would not do me well.

8 Now, if that process was instituted rather than a policy instituted maybe via
9 rulemaking and if there was something of the nature of like for QA plants, that, you know,
10 licensee submits what they changed, if the NRC doesn't comment in 60 days, it is approved,
11 somehow there's got to be clear closure that covers all the legal bases, and I think somehow it's
12 got to be similar to the license termination with regard to when does the public have opportunity
13 to input to that process or not, so you don't get later questions or get in court and say, well, you
14 terminated, but we didn't have the opportunity to -- as the public, we didn't have opportunity to
15 even hear what you were going to do, found this little side process to develop the policy.
16

17 MR. PITTIGLIO: George, you know, one of the questions I might have for you,
18 though, is while I understand what you're saying on that, I'd be interested to get your response
19 on the approach of a license amendment, which, of course, that process could subject you to a
20 potential hearing, but it would also provide the opportunity for the public to comment on it.
21

22 Now, if you're concerned about finality, certainly that's one mechanism by which
23 the public has comment, and clearly, it's identified in the license that that area is removed.
24

25 MR. ZINKE: Yeah. I think an amendment -- the amendment process does
provide some finality. So, I think that is an optional solution.

MR. FREDRICH: George, part of the reason that we were thinking about an
inspection for those cases was a desire to reduce unnecessary burden, and I think the gist of
your comments are that it may be removing the wrong burden.

In this particular case, at least at Maine Yankee, you might prefer something

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1 more formal. It's more work on your part but you see it as value added to doing it.

2 MR. ZINKE: Yeah. It depends on how -- we want something final at the very
3 end --

4 MR. FREDRICHS: Okay.

5 MR. ZINKE: -- in order to reduce legal risk, not to say that, you know, if
6 somebody was willing to buy the property with the fact that the license was really terminated
7 then.
8

9 MR. FREDRICHS: Okay. Yeah, you mentioned a rulemaking. That might also
10 --

11 MR. ZINKE: Yeah, rulemaking, amendment process. There are a number of
12 NRC processes that get public input and are formal and final. So, one of those needs to be
13 factored in.
14

15 MR. FREDRICHS: Okay.

16 Any other comments on the general idea of releasing a portion?

17 Yeah, Beverly.

18 MS. GOOD: Bev Good, GPU Nuclear, Oyster Creek.

19 As you know, we have an issue about trying to sell some property while we're
20 continuing to operate. Our company is divesting itself of generation assets, and we have about
21 600 acres of property that is to be sold in the near term.
22

23 We did an extensive scoping survey to try to provide assurance to the
24 prospective buyers that there was not an issue with the property.

25 There was confusion with the property because previously it had been a part of
the Forked River construction license that was terminated, and that license was terminated.

So, we had the interpretation that this property was not a part -- was no longer a
part of our license, and of course, that has different interpretations of it by the licensee and the
regulator.

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1 The position that really now is wanting to release the property -- it possibly has
2 an area that was impacted. We feel that we have dealt with that and we can handle that under
3 Subpart E or 30.36. We can demonstrate that it is suitable for public release, that the dose
4 contribution is zero.

5
6 In fact, we really want to work under the operational release criteria of
7 non-detectable, which gets us to the issue that George raised about closure.

8 If the property is sold and then eventually you wanted to be a part of a license
9 termination plan -- and that could be 20 years from now -- you know, there's going to be some
10 issue, possibly, of continuity since the licensee will no longer be an owner of the property.

11 So, one way to provide some closure to that is if we are proposing a
12 non-detectable operational limit, that that would bring closure to the issue. We can release
13 materials now under our operating license at non-detectable, and those aren't incorporated
14 under a license termination plan.

15
16 So, I guess we think we've been able to demonstrate some of these baseline
17 principles, but to get closure, if there's non-detectable, it shouldn't be a part of the license
18 termination plan.

19
20 MR. FREDRICHS: Okay.

21 MS. GOOD: And I guess, to add to that, I think we believe that -- just one more
22 point -- that you could probably do this under an NRC inspection, as well, versus a formal NRC
23 approval process.

24 MR. FREDRICHS: Okay.

25 Well, of course, the Oyster Creek situation is going to be handled, hopefully,
soon, and -- but I guess, looking at the longer term, the non-detectable criteria is -- well, it's more
restrictive than Subpart E, which would allow you, you know, some detectable activity.

So, I wasn't thinking of proposing it for the long term, but on the other hand, if
licensees can demonstrate that, and they're willing to, maybe we shouldn't discount it as a

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possible way of approaching the problem.

Actually, I've heard two really good comments now that -- things I wouldn't have thought of.

So, please keep telling me. I love this stuff.

MR. JOHNSON: Does the State of new Jersey have any comments on this particular issue?

MR. ZANNONI: Right now, no.

MR. PITTIGLIO: Do you have any other comments?

MR. CAMPER: I would add that the comment that was -- hearing the Oyster Creek comments, I mean it does demonstrate the urgency that I was referring to earlier.

I mean, under ideal circumstances, we would develop an approach, we would codify it within the regulations, it would be subject to the public comment process and so forth, ultimately the Commission would come to closure on the final rule, and I think, in due course, that's going to happen, and some of the vagaries that exist, if you will, today in Part 20 or Part 36 on the partial release issue will, in fact, have to be clarified, and the staff knows that and the staff will be working on a Commission paper to, you know, share with the Commission our views and afford the Commission the policy opportunity, obviously, but in the short term, we are sensitive to the urgency that is associated with your site, in particular.

While I didn't name the site during my comments, purposefully, probably everyone now knows which site we're talking about, but we are working rapidly to try to identify a process that will work at your particular site.

But I think that comments have been made along the same lines of what I said, perhaps stated a little bit differently, but I think we all have the same principles in mind.

You need -- you, the utility and the public, needs to know that there is some document, some approval process, some vehicle of formality that demonstrates finality and closure. That's terribly important.

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1 I think that my sense is clearly that the utility and certainly our agency wants the
2 site to be pristine in terms of being suitable for release for unrestricted use.

3 As you pointed out, if you sell a portion of that land, that land may very well be
4 developed as the reactor continues to operate.

5
6 Thirty or 40 years from now, after we're long gone basking in the sun
7 somewhere in happy retirement, we have to know, the public has to know that, at the time that
8 that portion of the site was released, that in fact it was determined to be pristine, if you will, and
9 then, in cases where there might be some contribution to dose -- I'm not suggesting that's the
10 case in your site, but that has to be factored into the ultimate release criteria of 25 millirem, and
11 public confidence -- we have to ensure that, along the way, as we deal with the Oyster Creek
12 situation and as we deal with this generically, that obviously there is an ample opportunity for
13 public awareness, public comment, and public confidence.

14 We want that, and I know the utility wants that, as well.

15
16 So, what we're trying to do in very short order is to articulate a process that
17 would be applicable in your situation and then could be applied generally, as well, but we're
18 going to obviously have to deal with this more generically and more formally.

19 So, we're trying, on one hand, to deal with the urgent situation, while also
20 dealing with the broader policy question.

21 So, we're going to have to work both sides of the street.

22 MS. GOOD: I just wanted to express our appreciation for, we understand,
23 paying attention to the urgency of the situation, and we thank you for that.

24 MR. GENOA: I just wanted to -- Paul Genoa of NEI -- for the benefit of the
25 public try to very quickly provide some insight into why there is some urgency to transfer this --
have a process to transfer this land after license -- or after the cessation of operation.

We have a couple different folks at the table who have different reasons, and
there are elements of this issue in all of them.

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1 One, I'd like to introduce Tom Meek from Trojan, and they actually have
2 essentially terminated the Part 50 portion under their ISFSI, and maybe you could just briefly go
3 through why you wanted to do that and so forth.

4 MR. JOHNSON: Paul, before we do that, there's a couple of people standing
5 that I think want to comment on perhaps some of the Oyster Creek discussions, and maybe we
6 should do that before going on.

7 MR. GENOA: Okay.

8 MS. McBAUGH: I'm Deborah McBaugh, and I'm with the Conference of
9 Radiation Control Program Directors and also the State of Washington.

10 After listening to the discussion, I have comments from two different ways, and
11 one is sort of philosophical and theoretical, which is what I was first thinking about, and it kind of
12 comes from us having to deal with Hanford, and there will be areas that may be released on that
13 site that are sort of in the middle, and from that standpoint, I was thinking, once you release a
14 portion and you say this will not expose anybody to over 25 millirem, or whatever you come up
15 with, once you release the entire site, do you then say it's also 25 millirem from the entire rest of
16 the site as well as this, or do you have to enfold it into one discussion, and so, that was one
17 thing I was thinking of, but the other issue that has more to do, perhaps, with Oyster Creek is
18 that material licensees -- we frequently have facilities where they sell off portions of it, and it gets
19 used by another lab or another hospital or another nuclear medicine facility, and we don't go
20 back afterwards and say, when that licensee finally terminates, that you've got to go and take a
21 look at this area.

22 So, I kind of looked at it from two different ways, and I'm not sure what we're
23 going to do in our state. I think there might be an answer case by case, I'm not sure, but that
24 made me think, and I wanted to at least bring those comments up.

25 MR. DARMAN: Joe Darman, Maine Yankee.

I just wanted to make a comment on the -- if you're going to use no-detectable

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1 as a release criterion, then it would be even, you know, more important to get an NRC approval
2 of what that no-detectable is, because somebody could always go back and look harder, and
3 there's really no end to that no-detectable criteria. So, that's kind of a drawback.

4 The other thing is, if that 25-millirem would apply to other areas of the site, you
5 know, it's my understanding through MARSSIM -- maybe we could get some of the dose
6 modelers but that that 25-millirem is applied to each survey unit, and the way they model those
7 survey units, typically the area required to produce all that dose takes a much larger area.

8 For instance, the direct dose is from an infinite plain, and so, if you look at one
9 area as a survey unit and it's released under 25-millirem, if there is another one next to it, it
10 really shouldn't affect it from the pathways that are considered.

11 MR. JOHNSON: Thank you.

12 MR. TARZIA: Yes. Jay Tarzia from Connecticut Yankee.

13 My comment was very similar to what Joe had just brought up.

14 You know, you allow us in your approval framework -- and Tom had actually
15 mentioned it -- if we do an evaluation and we show that an area or our structure or component or
16 whatever is non-impacted radiologically, we have been allowed since the beginning of time to
17 release it under current NRC guidelines, 81-07 and so forth, with the no-detectable process, but
18 in recent years, we have all found that that process breaks down if somebody comes in with a
19 new detector or new technology and identifies very small residual radioactive material on
20 something, even if there is no health and safety, really, consequences, and I just wanted to
21 reiterate, I guess, that, you know, we're proceeding down a road that I think we could get into a
22 lot of trouble with no-detectable unless the NRC clearly stands behind the guidance that they
23 have provided us and that the minimum detectable activities in their guidance are adequate to
24 protect the health and safety of the public, because you know, we have been driven to spend
25 millions of dollars in the industry removing material from our site in many cases where we have
clearly released it appropriately under the NRC guidance because somebody now has come in

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1 with a new technology and has demonstrated that there may be some activity present but it is
2 below what we have released it at.

3 So, if we're going to release a license using this methodology, we have to be
4 sure that, if somebody comes in five or 10 years down the road and detects some activity using
5 a much more sensitive type of device or instrument, that the license will still be terminated as
6 long as we can demonstrate that we released it under the minimum detectable guidance that
7 was present at the time.
8

9 MR. PITTIGLIO: Thank you. I mean we recognize that no-detectable has been
10 an issue as far as instrument sensitivity, and it's certainly a concern.

11 MR. JOHNSON: And I think we have those same concerns about closure that
12 have been discussed, and I think we appreciate the comment that no-detectable as a standard
13 doesn't necessarily solve all the closure issues.
14

15 MR. GOLDIN: Eric Goldin, Southern California Edison.

16 I am not a licensing guy, so I am sure there's some provisions places that I am
17 not aware, but when you guys are developing guidance, I'd encourage you to keep in mind that
18 there are all kinds of permutations you can come up with.
19

20 For example, a licensee may want to survey an area, have that area, surveys
21 and all, inspected by the NRC such that, in the future, that portion of the licensed area could be
22 removed from the license or the license terminated without having to go through another survey
23 process.

24 For example, survey an area and then eventually transfer that property to a
25 different license for multi-unit sites, for example, or to transfer to a Part 72 license if an ISFSI
was built on the site and not have to go back later and re-survey the area again, just some
things to think about.

MR. PITTIGLIO: Okay. Thank you.

MR. JOHNSON: Tom, I think I interrupted you before you got started, so go

1 ahead.

2 MR. MEEK: Tom Meek from Trojan.

3 We plan to build an ISFSI and, in fact, have constructed an ISFSI inside of our
4 industrial area, an area that was impacted right where our rad waste storage building was, and
5 at the time we began planning for that activity, we thought, well, we don't want to have --
6 someday, we hope by 2003, we'll no longer have a Part 50 license.

7 We didn't want to have a Part 50 license under our ISFSI and a Part 72 license
8 for the above-ground activity, and we talked it over with the NRC.

9 We submitted a final -- a survey plan for that area.

10 We also recognized that, once we began putting Part 72 license material into
11 the ISFSI, areas adjacent to it would no longer be capable of being surveyed for direct radiation
12 on the Part 50 license because of the Part 72 direct radiation contributions.

13 So, we developed a survey plan, submitted it using 58.49 methodology and
14 criteria -- basically the old Reg. Guide 1-86 levels, and performed a survey to that criteria,
15 submitted the survey data to the NRC, and it was reviewed, and we actually received back a
16 letter stating that that was an acceptable method, and there was some confusion, I guess.

17 It took quite a while to resolve what that means when you have an island that is
18 no longer a Part 50-licensed facility within your 640-acre site, and it discussed ODCM impact,
19 members of the public, where is our site boundary.

20 We did resolve most of those things, I think, satisfactorily and ended up now
21 with basically a Part 72 island inside of our Part 50 license.

22 I think we resolved most of the questions. The one that took us the most time --
23 and I'm not sure how it's resolved, especially if you terminate the license versus going to a Part
24 72 license, but what do you do with the dose inside -- if there's residual radioactivity, how do you
25 add the dose from the residual radioactivity with the routine releases from the facility that
surrounds it. We're still looking at that.

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1 Because our site didn't have any residual radioactivity in it, there was nothing to
2 add.

3 MR. PITTIGLIO: Let me go back and ask you a couple of questions.

4 That particular property was surveyed, I believe, under the Reg. Guide 1.86
5 numbers, correct?
6

7 MR. MEEK: That's correct.

8 MR. PITTIGLIO: It was done before our dose assessment regulation.

9 In addition, that property is under the Part 72 license now.

10 MR. MEEK: That's right. So, it's a licensed Part 72 facility.

11 MR. PITTIGLIO: Because your intent is to eventually terminate the Part 50
12 license and keep the Part 72 license.
13

14 Now, also, it was my understanding you went in there to establish the criterion
15 so that, at the time you terminated the Part 72 license, you didn't have to get into the question as
16 to what was under the pad and so forth.

17 MR. MEEK: That's right. We poured close to a four-foot-thick concrete pad for
18 our ISFSI, and we really didn't want to have to -- at the termination of Part 72, we recognize we'll
19 have a decommissioning plan for that, or a license termination plan, but we didn't want to have
20 to dig up the concrete.
21

22 Operation of the ISFSI should not result in any contamination below grade, and
23 we were going to try to do everything we can to save cost at the end of that process.

24 MR. PITTIGLIO: Any additional questions?

25 MR. ZINKE: Paul wanted us to -- at least for the purpose of the public, you
know, why we're interested in early release, and every plant site may be a little bit different.

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I think, in bottom line, it's that the property that we have a plant on is valuable for
other things. For Maine Yankee, things that factor into that are that, when we were operating,
we were a major portion of the tax base for our town, and so, the town is interested in -- because

1 now we pay less taxes -- of attracting businesses and locate them on that property in order to
2 get their tax base back up.

3 So, it becomes important to the community of -- you know, you get off this land
4 so it can be used for something good.

5 Part of our property we wish to donate -- we've agreed to donate it for like an
6 environmental facility.

7 So, I think some facilities may -- some of our property, the various government
8 agencies might be interested in its use, or public groups.

9 So, what we're trying to do is make sure we have a process that allows that to
10 go as speedy as it can without bypassing any of the controls or protective measures that were
11 there to make sure that the public is going to be protected and the doses are adequate so that
12 somebody can come in there and go on with new things.

13 MR. CAMPER: Okay.

14 Let's take one more comment on this particular issue, and then we'll move on to
15 the next agenda item.

16 MR. FULLER: My name is Ernest Fuller.

17 I think it's very important that all of the -- for a particular site, that whatever the
18 limit is, if it's 25-millirem, it needs to apply to the entire site no matter what the timeframe that it's
19 released at.

20 I think if you have a non-detectable criteria for that, that's all to the good and
21 that's a very good criteria to use for the entire site.

22 I think it's important to use a license amendment with an opportunity for public
23 comment for all four of your boxes and not just have an NRC inspection.

24 I think, in a lot of sites, there are things that have happened perhaps long ago
25 that the current licensee personnel and NRC people don't know about, that potentially can come
out in a public process.

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1 I think that's happened to some extent at the reactor I know most about, and I
2 think it's important to remember in all of this that the utility, just like a person makes decisions
3 over time and some of them turn out to, you know, not be the decision we would make if we
4 were making it today, but just -- I don't think the NRC should have the feeling we have to bend
5 over backwards because the utility has changed its mind about what it wants to do with this site.
6

7 At one point, the utility decided to use it for certain purposes, and it should live
8 with that until it completely cleans it up.

9 MR. CAMPER: Okay. Thank you.

10 Okay. Next topic.

11 MR. PITTIGLIO: Paul, did you have other people that wanted to comment on
12 this?
13

14 MR. GENOA: In the interest of time, it's not necessary. We wanted to point out
15 that there are a variety of reasons why you want to take this property and make it available for
16 societal use, that's all.

17 MR. PITTIGLIO: Thank you, Tom.

18 We're going to take just a few brief minutes and talk about the updated cost
19 estimate for the license termination plan, and then we'll come back and address some other
20 issues.
21

22 Basically, up in the front, we really haven't received a lot of argument or
23 disagreement about this, but we wanted to just run through and identify key items, and the
24 regulation requires an estimate of the remaining decommissioning cost and basically a
25 comparison of the cost estimate with the present funds set aside to make sure that sufficient
funding is available.

ADN The applicable part of the regulation is identified as 52(a)(9)(ii)F).
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& The next slide basically just identifies what we consider are the key elements to
ASS be included in the cost estimate but not necessarily all the elements, and I'm just going to hit the
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1 bullets very quickly.

2 The cost assumptions used, including the contingency factor, the major
3 decommissioning activities and tasks, what we call the unit cost factors, the estimated cost of
4 decontamination and removal of equipment and structures, estimated cost of waste disposal,
5 including applicable site charges, estimated final survey cost, estimated total cost.
6

7 Now, basically, the next slide just hits a couple -- again, what the cost estimate
8 should focus on, and because we do look at it and compare it to the remaining funding that's left,
9 the focus should be on the remaining work, with some detail, including cost of labor, materials,
10 and equipment, etcetera, should be based on credible engineering assumptions, and include a
11 cost of the remediation action being evaluated.
12

13 It should include transportation costs, disposal of the waste generated, and
14 other specific appropriate costs.

15 Again, we really don't look at this as a contentious area.

16 For many of the decommissioning areas that we've seen, the cost estimates
17 have identified all those, but we wanted to take this opportunity just to highlight what we consider
18 the key areas of cost assessment.
19

20 Anybody have any questions?

21 MR. ZINKE: George Zinke, Maine Yankee.

22 During the initial stages of decommissioning, we filed a site-specific cost
23 estimate, and my question is -- I'm assuming you acknowledge that, when I send in a license
24 termination plan early in the process, it may not -- the cost estimate may not be much different
25 than my estimate that I have just submitted, because I haven't spent much money and my
estimate's still the same.

MR. PITTIGLIO: We certainly recognize that. I believe that's submitted shortly
thereafter or as part of the PSDR process.

MR. ZINKE: Yeah, it's within two years after you send in your letters.

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1 MR. PITTIGLIO: Yeah, so that if you're early on in the process, I would not
2 envision much change in the cost to complete the decommissioning, but again, it should either
3 be submitted or referenced, and we would, as part of the approval process, take a close look at
4 it, even though I'm not sure that it's going to pose any problem.

5
6 Certainly, for example, where decommissioning is way down the road, the cost
7 estimate is going to be less, some of the funding is going to have been used, and that will be a
8 little bit different.

9 MR. JOHNSON: Most power plants are required to -- through their public
10 utilities commissions -- to provide very detailed cost estimates, and those would normally be
11 acceptable for submittal here.

12 MR. PITTIGLIO: If we don't have anymore questions on that issue, I'd like to
13 take a couple minutes -- I know Paul had indicated he wanted to make a couple additional
14 comments on our initial discussion on --

15 MR. GENOA: Yes. Thank you. Paul Genoa, NEI.

16
17 Actually, I wanted to have two comments addressed that were raised by
18 members of my task force.

19
20 The first has to do with the change process and the 50.59 concept and trying to
21 draw a parallel between an activity that goes on within the reactor operating space that may be
22 some parallel, and that has to do with changes to the ODCM, which is very similar in pathway
23 analysis and dose modeling to license termination plan dose assessment.

24 MR. JOHNSON: Excuse me, Paul. ODCM is your off-site dose calculation
25 method?

MR. GENOA: Yeah. It is a part of our license that controls the release of liquid
and gaseous effluents during the operation of the plant, goes through a very similar pathway
analysis, and Dr. Eric Goldin is here from Southern California Edison and wanted to address that
issue very briefly, to draw that parallel.

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1 MR. PITTIGLIO: Paul, could you may identify who are members of your -- you
2 keep talking about task force, and I'm not sure we have identified who they are.

3 MR. GENOA: I mean I could go through an entire list.

4 I can just say that they are technical folks from each of the decommissioning
5 utilities in this country, and other interested members, and many of them are here today and are
6 in the -- during the course of the next day-and-a-half, you'll probably hear from most of them.

7 MR. PITTIGLIO: Okay. Good. Thank you.

8 MR. GOLDIN: Eric Goldin, Southern California Edison.

9 I just wanted to build on something that Jay Tarzia mentioned this morning when
10 you were talking about a change process.

11 The analogous situation is the Off-site Dose Calculation Manual, and as Paul
12 mentioned, that controls the program for liquid and gaseous releases, and that ODCM is -- the
13 initial ODCM, when a licensee wants to develop one, is approved by the NRC, and then changes
14 to the ODCM after the original approval by the NRC are made in-house by the utility, subject to
15 NRC inspection, with a fairly high level of management approval required.

16 That process is all written in the ODCM as a requirement and could certainly be
17 -- a same type of process could be part of an LTP, a license termination plan, so that the original
18 LTP is approved by the NRC and then changes within certain bounds could be made to the LTP
19 within the licensee's management cycle.

20 Thanks.

21 MR. GENOA: And again, those changes would not be allowed to change the
22 basic dose -- the allowable dose limits for those releases.

23 Those are fixed and cannot be changed, but it does allow for a different
24 methodology, a different pathway assessment, dose assessment, different technical inputs, and
25 so forth, and they are reported and they are available for review.

So, there are some analogies there we just call your attention to for your

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1 interest.

2 The other point was on the survey data information that's submitted and the
3 guidance on that.

4 Joe, would you introduce yourself?

5 MR. DARMAN: Joe Darman from Maine Yankee.

6 I just wanted to make the point or whatever that 58.49 gave some pretty clear
7 guidance on what goes into a final status survey report, what the NRC expected to see at the --
8 you know, at the end of the decommissioning process, and that type of guidance I haven't found
9 yet in any of the documents that are out there.

10 So, it's another area where we're kind of left out on our own to -- you know, what
11 you guys want to see at the end of the process.

12 MR. PITTIGLIO: Thank you. That's a good point, and I know that DG 4006 is a
13 draft document, and maybe we can address it as part of the revision to that document.

14 MR. GENOA: Thank you.

15 MR. CAMPER: Anyone else? Any comments from the topics for this morning?

16 [No response.]

17 MR. CAMPER: Okay. Hearing none, it's 11:30. Let's break for lunch and
18 remind everyone to be here, please, at one o'clock, and Chairman Dicus will be here at that time
19 to chat with us.

20 Thank you.

21 [Whereupon, at 11:30 a.m., the meeting was recessed, to reconvene at 1:00
22 p.m., this same day.]

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AFTERNOON SESSION

[1:00 p.m.]

MR. CAMPER: Okay. Everyone is back from lunch, I see. We're all back on time. We do appreciate that.

As I mentioned this morning, we have the good fortune to have Chairman Greta Dicus join us, and, as I mentioned, we're very happy to have her, obviously, and we're very fortunate to have her, because until yesterday afternoon, she was wondering whether she was going to be on jury duty today or not.

CHAIRMAN DICUS: Yes. I spent yesterday at the courthouse, but I'm here today.

MR. CAMPER: So Chairman Dicus has joined us and it's a pleasure to have you.

CHAIRMAN DICUS: Thank you very much. I, unfortunately, can't stay for very long. Last week I was at a meeting in Florida, gave a speech, it was an ANS meeting, and when I read Inside NRC this week, they talked about the fact that I swooped in and then left, and I'm afraid I'm going to be guilty of that again today, swooping in and then leaving.

But time gets to be at the essence here, but I don't want you to think that because of that, I give any less importance to these workshops and to what is accomplished here. To the contrary.

One of the reasons I am pleased that I did my civic duty yesterday, but I didn't have to do my civic duty today and that I can be here and not be on jury duty, is the importance -- that's right, Judith, I was called in for jury duty yesterday.

But at any rate, the importance that I give to these kinds of workshops and most importantly to the dialogue, we may not always come to agreement. We may raise issues that we really can't resolve. But the dialogue is ever so important and it must always continue, even if there are differences of opinion or it becomes, at times, almost a dead end.

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1 But I have found, for the most part, irregardless of what the issue is, you're
2 usually able to, for most of the issues, reach an understanding, if not resolution and agreement.
3 But the dialogue is so very important.

4 And when we talk about decommissioning a facility, whatever kind of facility it
5 may be, and we're dealing primarily here with nuclear power reactors, it's part of the finality of
6 the cycle. We still do not have resolution of the high level waste and there are still some issues
7 with low level waste, but still I think we all, in some way or the other, want to reach finality in
8 such a way that we have done what we set out to do, and that is to protect the public health and
9 safety and to ensure the protection of the environment, which is the statutory requirements of
10 this agency.

11 But I also put a great deal of emphasis on these workshops and this sort of
12 dialogue because I think it's an important part of what we should do as an agency in our public
13 outreach programs, and I so support the concept of public outreach. That's another reason that I
14 made sure I could carve out the time to be here today, even if I do swoop in and, unfortunately,
15 swoop out.

16 I have done this in other fora a couple of times. I plan to continue to do it.
17 Where there are particular issues, I've gone to the area and I've met with whoever wanted to
18 meet with me. Commissioner Merrifield and I went up to the Millstone area, to the Millstone
19 plants, and we spent a half a day. Unfortunately, it was only half a day and we had to restrict the
20 time that we could spend with individuals, but we met with state and local officials, we met with
21 public interest groups, we met -- some public interest groups only representing one person, but
22 we met with whomever wanted to meet with us, just to listen.

23 We didn't talk, we didn't preach; we simply listened. And I had the opportunity at
24 the end of April to go out to Nevada to Yucca Mountain and did the same thing. This time,
25 fortunately, I had a full day and so I cut out a lot of time. Again, I met with public interest groups,
I met with state and local officials, I met with two Native American tribes, and I met with the

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1 press, I met with whoever wanted to meet with me and I listened and I learned a lot.

2 I learned how the NRC might not be coming across like it should and may not be
3 explaining what its role was and whether -- and the people I met with didn't necessarily agree
4 with Yucca Mountain. In fact, for the most part, they didn't agree with Yucca Mountain, but they
5 wanted to be part of the process, even if that part was to stop the process. They still felt it was
6 important to be part of the process. So we were able to explain how to be a part of that process.

7
8 I came back, I shared my experiences in both cases with the staff and I think
9 dialogue we have had since then, particularly in Nevada, has been much more productive and
10 it's made people feel that they could be part of the process and they understood where the NRC
11 is and where we're coming from.

12
13 So I just wanted to say that, so you really understand the importance that I give
14 to your being here, coming in as stakeholders, giving up your time to participate with our staff to
15 deal with the issues that we have before us.

16
17 Now, some of the things here I'm getting ready to say probably is what you've
18 been talking about this morning. So I'm probably going to bore you for the next ten minutes, but
19 I'll try not to bore you too much longer than that.

20
21 We, the Commission, asked the NRC, about a year ago, it was July of '98, to
22 have a series of workshops and to work with stakeholders on developing our standard review
23 plan for our license termination rule.

24
25 So the workshop today and tomorrow, a two-day workshop, I understand is the
fifth in a series of at least six that were planned, but I think we're going beyond that probably on
some other issues, to develop the standard review plan for our license termination rule and to
support the overall concept of decommissioning.

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The other workshops, I think, have dealt with dose modeling, with ground water
modeling, which is very much a topic on our mind right now. I think restricted use, how to do
ALARA analyses and things of that nature, and you continue walking down the path to work out

1 the various issues with the license termination rule.

2 This particular workshop has incorporated the concept of trying to deal with the
3 license termination plans and what is anticipated or expected in such a plan, and that has come
4 about because the staff has received plans that they have rejected.

5 And when you get a license termination rule -- plan, rather, that is rejected, that's
6 a waste of resources. It's a waste of resources for the agency, because staff has to spend time
7 looking at it and then send it back, that's spinning one's wheels. Clearly, it's a waste of
8 resources for the licensees who spend time putting that plan together thinking this is what is
9 wanted, this is what we should do, and then they get the plan back and have to start over again.
10 And anytime you spin wheels, you are not making progress, but rather you're either staying in
11 one place or you're going worse, you're going backwards.

12 So we've had such positive response from the workshops we've already had, we
13 thought it would really help to bring this one together and to put into it also a discussion of
14 license termination plans so that everyone better understands what the staff expects from the
15 licensees, what the public can understand is going to be part of those plans, and then what the
16 staff maybe can learn and hopefully will learn, I'm looking at the staff now, on maybe what we
17 anticipate is needed in a plan may not be what is needed in a plan.

18 So it's a two-way street. It's not just for those writing the plans to try to learn
19 what it is that you should put in the plan, but I think you want the staff, if there are things that we
20 think should be in a plan, that the licensees or the public or the states, and I'm going to get to the
21 states in a minute, say this is not useful, then we need to learn from that, as well.

22 But I'm hopeful that we come out of this with a much better understanding of
23 what should be in those plans.

24 And then, finally, I'm especially pleased, once again, to have state
25 representatives here and, actually, there is time carved out tomorrow on the second day of the
workshop to hear the states' concerns with license termination plan, with the license termination

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1 rule, with what we are doing, because clearly the states have a voice in this.

2 And, of course, I'm a states person, having directed a state program, having
3 been involved with the Conference of Radiation Control Program Directors, and, of course, the
4 Organization of Agreement States, I'm very attuned to and sensitive to what state concerns are
5 and to what role the states might have as we go down the road of decommissioning and
6 removing facilities from active service and perhaps being able to return those sites to
7 unrestricted use or perhaps, in some cases, to restricted use, but certainly at least one goal is for
8 unrestricted use, even to the point of greenfield, if such is possible.

9 So at any rate, those are some of the thoughts that I wanted to share with you. I
10 think probably Larry, in his opening comments this morning, set forward what the expectations
11 were of this workshop. So I am probably repeating his comments.

12 But the three things I do think are important enough to bring up again. One is
13 for everyone to have a better understanding of the NRC staff's requirements for license
14 termination and decommissioning plans and for the NRC staff to have a better understanding of
15 what the industry and the public's and the states' concerns are with regard to what those plans
16 should say, and particularly with regard to the states, item number two, the states' issues with
17 decommissioning are clearly voiced and that we, as well as the public, from those states,
18 understand what those concerns are and have input into them.

19 Then, finally, the issue that I actually opened with is to have the third point, this
20 continued opportunity for all of us, stakeholders, including the NRC, because we are a
21 stakeholder in this, as well, to continue our dialogue on the issues that surround
22 decommissioning and the activities that surround decommissioning, so that we can come to the
23 best possible end point and solution to whatever these issues may be.

24 So I wish you all a continued really good workshop and I can hang around for a
25 few minutes, if there are any questions or comments that anyone might like to make and that I
could listen to, or concerns that you have that you would like to bring up with me.

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1 I thank you, otherwise, for your attention.

2 MR. JOHNSON: Are there any questions?

3 MR. HOLMES: Bob Holmes, from GP Nuclear. You mentioned finality and
4 we're all interested in that. I'm curious where we are right now with the EPA's standard and your
5 discussions with them and what your feelings are as to how that might be closed out in the
6 future.
7

8 CHAIRMAN DICUS: That's an excellent question. We continue to have a very
9 productive dialogue with the EPA on our standard and their proposed rule that isn't quite out on
10 the street yet. I think there has been some progress there. Some of the issues that we have
11 raised, particularly on implementation of a rule, should the EPA finalize a rule, particularly with
12 Yucca Mountain, or make -- which is the one that's getting ready to be out on the street -- or
13 decide to do rulemaking with regard to decommissioning and cleanup standards, which is still a
14 guidance document on their part and not a rulemaking.
15

16 If we can get perhaps some finality with Yucca Mountain, perhaps there is a
17 pathway to success to move with some finality on the cleanup rule, as well.

18 But right now it's still in dialogue. We do have a representative from EPA in the
19 audience. I don't know if he wants to say anything or not. He's hiding right now. He's burying
20 his head, so I guess he doesn't want to say anything.
21

22 But we do have a dialogue going on with the EPA, but we do not have finality on
23 that issue.

24 I appreciate your bringing it up. We hope to, as you know, in our legislative
25 package, we have suggested certain legislation with regard to CERCLA, and to try to address
that. I don't know where that's going to go, but we would like to see finality on that.

MR. GENOA: Paul Genoa, with NEI. I wanted to comment how much I
appreciate your interest in this and providing the staff incentive to have these workshops. It is a
two-way street. We are learning as much as we are sharing, and so it is a valuable opportunity

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1 for us and I will continue to support that effort.

2 I would echo the comments. We do need a closure and resolution on that issue.
3 There currently are communications going on from both agencies and it's confusing the public.
4 It is bringing up fear and distress of our regulatory approach and our structure and what we're
5 doing and licensees moving forward, and it's not productive and I'd like to see it stopped, and we
6 would support the legislative solution.
7

8 CHAIRMAN DICUS: Thank you. Anyone else?

9 MR. ATHERTON: Chairman, I'm Peter James Atherton. I would hope you could
10 give perhaps a broader picture concerning the fuel issue. For instance, some of the older plants
11 are not designed to have their spent fuel pools used for long-term storage and dry cask is a
12 relatively new concept and it has not been through a qualification program for long-term storage
13 of nuclear fuel.
14

15 What does the long-term storage of nuclear fuel look like from your perspective
16 and how do you propose to qualify or upgrade spent fuel pools to handle a temporary or interim
17 storage of spent fuel pool in the event there is a delay in getting a permanent site for spent fuel
18 pool?
19

20 CHAIRMAN DICUS: Two or three or four questions there, so let me try to get
21 into maybe the heart of the question, which really has to do with the safety or validity of storing
22 spent fuel rods for some period of time before we do have some sort of either permanent
23 repository or interim storage unit of some sort or the other.

24 The spent fuel pools are simply meant really for the shorter-term storage and I
25 think most, if not all of the utilities, if we're not able to have a permanent repository in the next
decade or so, will be going to dry cask storage.

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Now, our waste confidence policy has addressed the issue of using dry cask
storage for some period of time, decades, and we've found that -- and we've evaluated that and
we've found that to be a viable option, not for the long-term, not for infinity, but for the

1 shorter-term, which is in terms of many decades, that the casks themselves, together with the
2 kind of security and the fact that over time the rods -- the spent fuel rods change, that it is
3 reasonable, it is safe, so long as it is monitored, so long as it's under license, et cetera and so
4 forth, under the jurisdiction and regulatory structure that we have in place.

5
6 We feel that by policy, and if Larry wants to jump in, he can at any time, but by
7 policy, it's still the NRC's position that the long-term solution, the safest thing is for a geologic
8 repository and that is the direction that we will go until we have reason not to, and we do not
9 have such reason at the time.

10 Whether or not that's Yucca Mountain, we won't know until the characterization
11 is finished, till the President gets a recommendation from the DOE, and until the President
12 makes up his or her mind, depending upon who is President at the time, on what they want to do
13 and then we get a license application for evaluation.

14
15 So it's very pre-decisional obviously on Yucca Mountain. But the concept that a
16 geological repository is the ultimate solution is still the policy of the NRC.

17 Larry, did you want to add anything?

18 MR. CAMPER: No. I think it is very well stated, that that has been the policy,
19 the consideration for some time. It's still the goal that we're working toward. Obviously, there
20 are a number of technical issues that are being worked through. There certainly are a number
21 of political sensitivities that have to be worked through.

22
23 But as the Chairman has said, we still believe that is the way to go. Obviously,
24 reactor sites and we are struggling to try to find interim measures that will ensure public health
25 and safety and hopefully also include public confidence.

But we do remain committed to the long-term geologic disposal.

MS. JOHNSRUD: Judith Johnsrud, from Pennsylvania. Many of our states
have been going through the struggle of utility restructuring, plus mergers, sales, and now the
entry of foreign ownership into our electricity supply system. And I hear a good deal of concern

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1 about the impacts of these rather radical changes in some instances with respect to assuring the
2 availability of decommissioning funds and the continued capability to continue to monitor sites
3 over periods of time, particularly if there are delays in the decommissioning actions for any of a
4 variety of reasons.

5
6 I was looking for your question, but -- okay. First of all, on what is happening
7 with utility restructuring and sales of plants and so forth, clearly, and when we get into license
8 transfers, we must prove those, and one of the things the Commission, the staff looks at very
9 closely, just one of the things that we look at is the assurance of and the availability of the
10 decommissioning funds and the protection of those decommissioning funds as these transfers of
11 licenses occur, part and parcel of what we do.

12
13 We also have rulemakings already in place, together with, I think, some
14 proposed rulemakings that are also dealing with assuring the adequacy of decommissioning
15 funds, whether it be in the case of license transfers or not in the case of license transfers.

16
17 So it's clearly what we are doing as part of that oversight and if there are any
18 delays or concerns over decommissioning, I think the NRC is here to stay and we are very much
19 involved with all the rulemakings that we have ongoing with decommissioning and there's more
20 than one.

21
22 In fact, I think there are six or seven rulemakings with decommissioning and I'll
23 have to defer to the staff on the particulars on that. But I know that there are many things going
24 on. So clearly we are here for the long term. We are here to see these things through, we're
25 here to monitor these things and to ensure, again, that we meet our statutory requirements of
protection of the public health and safety, protection of the environment.

MR. LAUER: Mike Lauer, GTS Duratek. Something near and dear to a lot of
our hearts in the decommissioning world is the access to low level waste disposal. I guess the
leaves are rustling again down in South Carolina. A lot of independent waste disposal entities
are popping up. I was just wondering what your views were on the compact process and what

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1 the Commission's direction is.

2 CHAIRMAN DICUS: Gee, I think my time is just about up.

3 MR. CAMPER: Didn't you have an appointment, too?

4 CHAIRMAN DICUS: I think so. No. All these are good questions and I really
5 appreciate your bringing them up. I really do appreciate this. This is good, a good interchange.
6

7 I'll tell you, I think you probably maybe know my background. I represented my
8 state on our compact commission, trying to site in Nebraska, which we did site in Nebraska, and
9 I even chaired that compact commission and clearly not necessarily successful.

10 As a matter of fact, there hasn't been a successful siting of a low level waste
11 facility or a successful licensing, I should say, of a low level waste facility since the act became
12 official, became law. And I don't think we're going to.

13
14 I think probably -- and this is Greta Dicus, Commissioner, talking, this is not a
15 Commission position. I need to make that clarification before. But I don't think it is working and I
16 think Congress probably has to readdress it or abandon the act, because it clearly is not
17 working.

18 We do have the site in South Carolina and, as you said, the leaves are rustling
19 down there and I don't know what's going to happen to that site. We have all the confusion over
20 whether North -- you know, the war between the Carolinas and where that war is at the moment,
21 and I'm not even sure I can keep up with it on a day-to-day basis.

22 The site in Texas went down, the site in California went down, more sites, like
23 Pennsylvania has given up the process all together and so forth.

24 So it obviously hasn't worked. We don't have to hide our head in the sands
25 about that. It's pretty clear that it isn't happening.

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The site in Hanford is working, but then we have, for example, the private sites,
the one being the storage area, the storage site in Texas and whatever is latest there, I'm not up
on. The site in Utah, I guess there are two sites in Utah, and whether private industry and

1 private initiative is the way to go, and it may well be.

2 I gave a speech about a year and a half ago challenging whether or not we
3 should give up the Low Level Waste Act and whether the compact system was working, and I
4 argued that it was, more because I didn't necessarily believe that, but I wanted someone to
5 argue with me about it, and no one would argue with me about it.
6

7 But I've come around saying what I think is the truth. It isn't working, it hasn't
8 worked. It's time to do something different and maybe private industry being able to develop
9 sites and go that route is the way to go.

10 But as I said, that's my personal opinion. That's not a Commission position. I
11 want to make sure we understand that. We haven't taken a position on this, other than support
12 the act as it stands at the moment.
13

14 MR. FULLER: My name is Ernest Fuller and I'm a member of a citizens group at
15 a reactor that's being decommissioned. I want to, too, thank you for having these meetings.
16 They are very useful to those of us who want to learn more and want to have a part in the
17 process of the decisions.

18 I'm glad that I was called by someone so I could come. It was someone from
19 the NRC. I think it's a shame that it hasn't been able to be more members of the interested
20 public here and I would encourage you to think about what ways you can use to do that, so that
21 I'm not here sort of an almost sole representative of the public, because I can't be.
22

23 CHAIRMAN DICUS: Understood.

24 MR. FULLER: That's not right. I did also want to just make a comment to you
25 that it's very important to me, as a resident in an area where decommissioning is going on, the
decisions that are made in this process are final and the utility will not be back, the NRC won't
be back, the citizens who live there will continue to live there and their children and
grandchildren.

And I think it's very important, therefore, that citizens have a legal right to

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comment on things and the license termination plan is a time where that can happen.

I think it's very important that there not be any real changes to what's going to happen after that plan has been approved, unless it also goes through some kind of a process where local citizens can comment.

At our site, things have come up because of things that citizens have said, and I think they have been useful to the utility and useful to the NRC as well, and I'm sure that's true at a lot of sites. People where we were, you know, people have lived there all their lives through this reactor's functioning. The people in the NRC, the people in the utility who are actually working on it today haven't been there that long, and we can learn a lot from local folks.

CHAIRMAN DICUS: Okay. A couple of things you said. First of all, be sure that we do reach out to all the stakeholders, and I've harped on that with the staff, because we continue to identify more and more stakeholders and we've got to be sure, to the extent we possibly can, that we don't leave people out.

Now, it's obvious that a lot of these meetings, I mean, we try to have meetings in the areas and I think we've done that, but a lot of them have to be, for example, here and it means travel and we understand that. But I think you kind of understand that, too, at least I feel that you do.

But it's important that we continue. And one of the things in the dialogue, I mean, if you recognize we've left a stakeholder out, let us know that, because we can't always necessarily know who everyone that we should reach out to. We're learning more and more of this every time.

The other thing you brought up, I want to ask Larry to address this, is the license termination plan; that once a plan has been agreed to by the agency and we put our -- say okay, we can live with this plan, and all of the ramifications, and that is a transparent process. That is publicly available. Then it should not change unless that change goes through the same scrutiny that the plan went through itself.

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1 Now, Larry is going to have to help me out, but I think that's the case or it
2 certainly should be and if it's not, then we have something else to dialogue over.

3 MR. CAMPER: Actually, this is something along the lines of what we discussed
4 this morning, actually, and it's the idea that when one of the reactor sites submits a plan, there is
5 a step in that process where that plan becomes available to public scrutiny.
6

7 The issue, the challenge for us, and we were discussing it in some detail this
8 morning, is when there is a need for change. As you know from our dialogue this morning, there
9 can be relatively minor technical changes, they may be as simple as adjustments to our
10 guidance, changes to the D&D code, for example, things that we can make the public aware of
11 along the way.
12

13 The challenge for us, and it is something we're going to have to wrestle with,
14 because as we discussed this morning, the issue of how to deal with changes to the LTP is
15 something that we're breaking fertile ground here. I mentioned this morning that the staff has
16 been in a hurry-up mode to create a lot of guidance and we have. A great deal of guidance
17 exists today and we're trying to articulate how to implement the guidance in terms of developing
18 the plan.
19

20 But I'll be the first to tell you, as I did this morning, that the question of change to
21 the LTP, and there were some very viable concerns expressed this morning, we are still working
22 our way through.

23 But let me just say this as a matter of principal, and I know that the Chairman
24 probably endorses this, as I've heard her say many times.

25 If we are going to have a process whereby some meaningful significant change,
and perhaps we will have to define significant as part of the process, is going to take place to an
LTP, then there needs to be an opportunity for public scrutiny and public comment.

And as we work our way through that, we will bear in mind some of the kinds of
concerns that we've heard this morning. But clearly if an LTP undergoes a significant change,

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1 there has got to be an opportunity for public scrutiny, absolutely essential to the process, and we
2 will do that. It's just a matter now of working out the steps of how we will ensure that happens.

3 CHAIRMAN DICUS: It's my understanding, too, that with dealing with a license
4 termination, that the first dialogue, and this may be in a workshop you've had and others are
5 possibly planned and working out dates and locations, is that correct?
6

7 MR. CAMPER: That's correct. This is one, and, Tim, maybe you can add to
8 this, because you have the history. We've had a number of workshops. We do intend -- this is
9 the one that -- the first, I believe, that deals with the LTP process itself. We anticipate that there
10 will be a need for others and we intend to factor what we hear today into that planning process.
11

12 In fact, tomorrow afternoon, as we wind down, we actually have a session on the
13 agenda where we're going to discuss the planning of the next meeting and what kinds of subject
14 matter and things do they feel is important to cover. Yes.

15 CHAIRMAN DICUS: Well, again, I want to thank all of the participants for giving
16 their time to be here, for your input and your dialogue. It's critically important, as I mentioned in
17 my opening comments.

18 I know it takes time away from other things, but it is important that you are here
19 and that you are part of what is going on. I also want to thank the NRC staff for the effort that
20 you put into this and for the time and concern that you give it. It's very much appreciated on the
21 part of the Commission.
22

23 So with that, unfortunately, I do need to swoop out and I apologize for that. But,
24 again, thank you very much and I appreciate your questions. Those were good thoughtful
25 questions. So thank you.

MR. CAMPER: Thank you, Madam Chairman.

[Applause.]

MR. CAMPER: Before we move to the next agenda item, I just want to take a
quick second to -- I want to compliment you on the caliber and nature of the questions that you

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1 had for the Chairman and the thoughts that you offered. They were very, very good questions,
2 very thought-provoking, and I do believe that she genuinely enjoyed them.

3 The next topic, demonstrating compliance with the LTR, focus on the dose
4 assessment methodology, Mark Thaggard of our staff is going to cover that for you.

5 You need about five minutes?

6 MR. ORLANDO: Five minute stretch, everybody.

7 [Recess.]

8 MR. THAGGARD: Good afternoon. I'd like to first apologize for the delay. My
9 name is Mark Thaggard. I'm a Senior Systems Performance Analyst in the Division of Waste
10 Management, in the Office of Nuclear Materials Safety and Safeguards.

11 Part of my presentation is demonstrating compliance with the license
12 determination rule, with a focus on the dose assessment methodology. I've included my
13 telephone number and e-mail address, in case anybody needs to contact me after the workshop
14 for additional questions, additional information.

15 Through my presentation, I intend to go over how to demonstrate compliance
16 with the license termination rule through the establishment of DCGLs. This is an informational
17 type of briefing, so I'm not going to -- the intent is not to draw any specific conclusions.

18 I am going to be going over an approach for how to establish DCGLs, but I need
19 to mention other approaches may be acceptable. While I am going to be talking about how to
20 establish DCGLs, I'm not going to be spending a lot of time in dealing with how to evaluate
21 DCGLs. That's covered in the MARSSIM training.

22 The organization of my presentation, I'm going to primarily cover three areas.
23 First of all, I'd like to give an overview of what DCGL is all about, for the benefit of people in the
24 audience that don't know what this concept means and what we're talking about when we say
25 DCGLs.

Then I would like to talk about an approach for how to establish DCGLs. This is

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1 going to be the bulk of my presentation. Then I'm going to end the presentation with a little bit of
2 information on how to establish DCGLemc's.

3 For the benefit of those of you that don't know what DCGLs are, they are derived
4 concentration guideline levels. Draft Guidance 4006 in the MARSSIM manual primarily talks
5 about the DCGLw, and that's the concentration within a survey unit corresponding to the dose
6 limits. So the concept being that if you've got uniform contamination at that concentration level,
7 you should meet the dose limits, assuming you meet the assumptions in the dose analysis that
8 you used to derive the DCGL.

9
10 Now, obviously, if you've got some elevated concentrations in your survey unit, it
11 wouldn't be appropriate to assume that those elevated concentrations are uniformly distributed
12 over the survey unit. So the MARSSIM manual also has an approach for dealing with hot spots
13 and that's through the use of these DCGLemc's, which stands for elevated measurement
14 comparison.

15
16 The DCGLemc is basically calculated by multiplying the DCGLw by an area
17 factor, and at the end of my presentation I'm going to spend a few minutes talking about how
18 you can come up with these area factors.

19
20 One last overview point, for buildings and structures, DCGLs are normally
21 expressed in units of activity per surface area. The most common unit is dpm per one hundred
22 centimeters squared, and for soils, they are normally expressed in activities per unit mass, and
23 we normally see those in picocuries per gram.

24 Now, I'm going to start going into a little bit of information about how to derive
25 the DCGLs. Let me, first of all, point out that when I talk about DCGLs and we talk about dose
analysis, we're talking about pretty much the same thing. They are pretty much synonymous.

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The main difference is that when we talk about deriving DCGLs, we're kind of
working backwards from what we would do in terms of doing a dose analysis. When we're doing
a dose analysis, we take a known concentration in an area and we're trying to figure out what's

1 the corresponding dose from that concentration.

2 What we're trying to do in establishing DCGLs is we're actually working
3 backwards, where we're taking a known dose limit and we're trying to figure out what's the
4 corresponding concentration that we can have to ensure that we achieve the dose limits. So
5 we're kind of working backwards.
6

7 But the main point I want to make is that the analysis is the same in both cases.
8 The dose analysis -- the analysis you do for determining doses is pretty much the same analysis
9 you do for determining the DCGLs. The reason I point that out is because NUREG-1549 has
10 this framework, which I apologize for the way it came out here, but NUREG-1549 has this
11 framework for how to do a dose analysis in decommissioning.
12

13 So I want to spend a little bit of time talking about this framework. Some of the
14 key aspects of the framework is that you begin by assimilating the information, about what you
15 know about the site before you go out and start collecting additional data.

16 You need to define your scenarios and identify your pathways, develop your
17 conceptual model, perform your analysis, and then this is kind of like a decision point here. You
18 look at the analysis and make some decision about whether or not the site is acceptable for
19 release. If it's not, then you need to look at various options that should be explored for
20 decommissioning the site.
21

22 These could include remediation, collecting additional data, imposing land use
23 restriction or some combination of those. Then you will update your analysis as needed.

24 I apologize for the way that came out, but the framework is pretty well described
25 in NUREG-1549, and some of you have seen this before.

 I am going to spend a little bit of time going through some of these steps. The
first step of the framework says that you assimilate the existing data and information. It may be
possible to do some screening or preliminary analysis based on information you gather as part
of your historical site assessment.

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1 It's kind of important to do some preliminary screening analysis before you go
2 out and do a major bigger collection effort, because you can possibly save yourself some money
3 by identify what's the most important data you need to collect.

4 Also, these preliminary analyses may help you in terms of determining what type
5 of decommissioning options should be pursued for the site.

6 One of the things I need to caution, though, is that if you use screening analysis
7 to come up with your DCGLs, you're probably coming up with DCGLs that are way too low,
8 because screening analyses are intended to be conservative. So if you use the screening
9 analysis to come up with your DCGLs, they're probably much lower than what may be needed.

10 That's not to say that they're not acceptable. I'm just telling you that that's a
11 caution.

12 Some of the information that you may be able to get from your historical site
13 assessment that can be used in your dose analysis is some information on the types and activity
14 of radionuclides. If you've got some information on your process, the type of process that
15 occurred at your site, that may give you some information on the type of radionuclides to look
16 for.

17 Obviously, information on the media that's contaminated, whether you're dealing
18 with buildings or you're dealing with soil or even ground water. And, also, information on the
19 possible extent and location of contamination.

20 Step two of the framework recommends that you define your scenario, the
21 scenario that you're going to assume in your dose analysis. Associated with that is identifying
22 your pathways.

23 The two default scenarios that have already been described for screening
24 analysis, the building occupancy scenario and the residential farmer scenario. Some of you may
25 already know this.

 Other scenarios may be proposed as justified. One other thing I need to point

1 out is that if you're looking to leave highly contaminated material on your site, one other scenario
2 you may need to consider is some type of excavation scenario, the possibility that somebody
3 can dig into that material at some point in the future.

4 One other thing is because the DCGL you get for a specific area, it's important
5 that the area in your dose analysis is consistent with the area for the survey unit where the
6 DCGL is going to be applied. There needs to be some consistency there.

7 I just wanted to spend a few minutes talking about these two default scenarios.
8 First is the building occupancy scenario. The building occupancy scenario assumes light
9 industrial activities, with residual contamination on the walls, the surface of the walls. This
10 scenario is primarily given for looking at standing buildings, if you're going to have buildings
11 remaining on your site at the end of -- after decommissioning.

12 There are three exposure pathways that are included; external radiation,
13 inhalation, and inadvertent ingestion of contamination.

14 The other default scenario is the residential farmer scenario. This is obviously given for looking
15 at contamination in soils. It may be used if you've got rubble material. There's a much wider
16 array of exposure pathways that's included because this scenario is intended to be fairly
17 comprehensive.

18 One other point I need to make is that if you are going to use the residential
19 farmer scenario for looking at something like rubble or this amount of building material, it may be
20 appropriate to exclude or turn off some of these pathways in the analysis, but that's going to
21 have to be looked at on a site-specific basis.

22 Step three of the framework says that you need to develop a conceptual model
23 of the system that you're trying to analyze. This is important, because it's important to identify
24 the key features and processes that need to be included in the analysis.

25 That's basically what the conceptual model does. For the benefit of -- let me just
define what a conceptual model is. It's basically just pictorial or qualitative description of the

1 system that you're modeling. You need to have a good idea of what you're trying to model and
2 what the key features and processes that you're trying to model.

3 So step three of the framework suggests that you develop a conceptual model.
4 I need to point out that both D&D and RESRAD have predefined conceptual models, whether
5 you realize it or not. So it's kind of incumbent upon the user to kind of know a little bit about
6 what those predefined models are, so that they can know whether or not they're appropriate for
7 their specific site.
8

9 Step four of the framework says that you actually do the analysis. This is where
10 you actually run the code. The most common computer codes that we see for decommissioning
11 are RESRAD and D&D. Other codes can be used and in some cases, other codes should be
12 used, especially if you're dealing with a case where you've got off-site transport or you've got a
13 fairly complicated hydrogeologic system. The D&D and RESRAD may not be appropriate for
14 those kind of cases.
15

16 Also, it may be advantageous in some cases to do what we call some auxiliary
17 analysis, some analysis outside of your dose analysis, where you can kind of feed results into
18 your dose analysis.
19

20 I'm going to talk a little bit about this in a little bit more detail in a few minutes.

21 Now, I've been working performance assessment and doing dose analysis since
22 I've been with the agency, for almost ten years now. So some of this is second nature to me, but
23 I need to point out what we are talking about when we talk about a dose analysis. The key
24 components that we normally see in most dose analysis is a source term.
25

 The source term is basically some information on the concentration and the
concentration of radionuclides and how they are actually getting out of the system and getting
into the accessible environment.

 Now, one of the things we need to point out here is because we are actually
trying to come up with DCGLs or we're trying to come up with concentration limits, one of the

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1 things you're going to have to plug into your analysis is probably some type of unit concentration,
2 and I'll explain that in a few minutes, how you can take that unit concentration and back out what
3 the DCGL is at the end.

4 Once you've got your source term, then you have to analyze the movement of
5 the source term or the movement of the radionuclides that gets out of the source area into the
6 accessible environment and that's normally looked at, the environmental pathways we normally
7 look at are air, ground water, surface water, and direct exposure.

8 Once we calculate how the stuff is moving into the environment, we come up
9 with concentrations and we have to convert those concentrations into some type of dose based
10 upon how -- what type of exposures that we're assuming that people are getting.

11 One other thing that I need to emphasize is that most dose analysis should
12 include some type of sensitivity and uncertain analysis, because we can't -- there is no way we
13 can say that we've got the exact answer. So there is always some uncertainty with any of this,
14 and that's why it's important that when you submit a dose analysis or you submit an analysis in
15 support of your DCGLs, that you justify the key parameters in the analysis.

16 This has been a real sticky area, but we often have to request a lot of
17 information from the licensees because they don't justify the parameters that they are using.

18 I emphasize the key parameters. One way you can identify the key parameters
19 is to do the sensitivity analysis. The sensitivity analysis is geared to help you identify what's
20 important. So it's important to do the sensitivity analysis to identify what's the important
21 parameters and then to provide some justification for why we should accept those parameter
22 values.

23 One of the things I mentioned earlier, and I hope everybody can see this, is in
24 most dose analysis, we have a concentration and we put the concentration into the analysis and
25 we get a dose out. Here we're trying to figure out, we're trying to calculate concentrations.

 So what we want to probably do is take something like a unit concentration.

1 Here we've got soil and we've got one picocurie per gram and we plug that into our dose
2 analysis. What we're going to get out of it is we're going to get a dose, usually in something like
3 millirems per year, but we can think of that dose actually as millirems per year per picocurie per
4 gram, because we start out with a unit concentration.

5
6 So we actually got what we call the dose conversion factor here. So to get the
7 DCGL, all we would do is to take the dose limit, the 25 millirem per year, and divide that by the
8 dose conversion factor, and that gives us our DCGL and picocuries per gram.

9 I hope I didn't confuse anybody with that.

10 One of the other things I pointed out earlier, also, is that in some cases, it may
11 be advantageous to look at doing some auxiliary analysis. If you're looking at leaving concrete
12 on your site, you need to keep in mind that most dose codes, like the D&D code and the
13 RESRAD code, models the release of radionuclides in a very simple fashion. Unfortunately, I
14 apologize that this didn't come out too well.

15
16 But just keep in mind that D&D and RESRAD models the release of
17 radionuclides in a very simple fashion. And if you use a code like D&D or RESRAD to try to
18 model releases from concrete, you're going to probably greatly overestimate the amount of
19 release you're getting, because it's basically a first order leaching process that assumes that the
20 radionuclides are only being helped as a function of absorption.

21
22 In reality, you've got some other processes going on there and one of the other
23 processes you probably need to look at is diffusion. This is a common thing that's done in the
24 low level waste area.

25 So the only thing I need to point out here is that if you've got -- you're trying to
model releases from concrete, you probably need to do some other analysis and you can do that
and then take those results and feed them into your dose analysis. A code like RESRAD allows
you to put in a leach rate.

So if you calculate a leach rate from a code that can handle diffusion, you can

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1 plug those leach rates right into a code like RESRAD. But if you try to model that using D&D
2 and RESRAD, you're going to greatly over-estimate your releases.

3 I just want to conclude by going over a little bit of information by area factors. I
4 mentioned earlier about these area factors. As I said earlier, the DCGL_{emc} is equal to the area
5 factor times that DCGL_w. So if we just simply rearrange this, we can see that the area factor is
6 actually equal to the DCGL_{emc} divided by the DCGL_w. Well, the DCGL_{emc} is actually simply
7 the dose conversion factor calculated at a smaller area.
8

9 So you can go into your model and just keep changing the area and calculating
10 the DCGL and divide that by the DCGL_w and you get these area factors. That's really all you're
11 doing.
12

13 This is a pretty straightforward process for coming up with the area factors. One
14 caution I need to make is that it's probably a little bit conservative, because I didn't say anything
15 about changing the exposures and one of the things you probably want to look at is as you make
16 the area smaller, some of the exposure pathways may not be appropriate any longer.

17 But the most straightforward way to do it is simply to recalculate your DCGL as a
18 function of the area and divide that by the DCGL_w and you can get an area factor.
19

20 One other caution I need to make is that Tables 5.6 and 5.7 in the MARSSIM
21 manual, they are only for illustrative examples and you shouldn't use those to come up with area
22 factors for a specific site.

23 That's a big no-no. So if you submit that, chances are we're going to send that
24 back to you. So just keep that as a caution, that you need to come up with site-specific area
25 factors.

That pretty much concludes my presentation. I'll try to answer any questions, if
anybody has any questions.

MR. DUVAL: Hi. My name is Ken Duvall. I'm with DOE. I have a question on
your framework, your license termination framework. I wonder if you could go to that slide.

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1 MR. THAGGARD: Okay.

2 MR. DUVALL: One of the questions I've had for some time is how NRC adopts
3 MARSSIM into their license termination framework. It is the policy of NRC to adopt MARSSIM,
4 but I have not yet seen how it folds into your process.
5

6 One of the problems is that MARSSIM is a decision framework which, as a
7 result, determines whether you release a site or not. Also, your framework, the license
8 termination framework is also a decision framework. So there are sort of some computing
9 processes there.

10 The other point is that MARSSIM uses the DCGLs as input into the decision framework and your
11 framework for license termination, I presume, uses the data as input into the framework. So I've
12 been trying to resolve this, in my mind, how MARSSIM fits into the scheme and it appears that in
13 order for this to be resolved, that the item number seven -- is that number seven?
14

15 MR. THAGGARD: Yes. Excuse me. I apologize for the quality of that.

16 MR. DUVALL: Or number five, where -- can the site be released.

17 MR. THAGGARD: Yes.

18 MR. DUVALL: If that box is labeled MARSSIM, then in that case, the DCGLs
19 from the dose assessment would be input into that box and the decision would be made based
20 on MARSSIM, and that would be consistent -- it would be consistently applied within your
21 framework.
22

23 I'm just offering that as a suggestion for how to resolve the conflict we're having
24 with the two different frameworks. I need NRC needs to show in their guidance how MARSSIM
25 fits into their overall framework, and I think that that might be one way of presenting that.

MR. THAGGARD: That's a valid question, actually. We had a lot of confusion
about this. One of the suggestions you made is to fit the -- to check right here, this decision
point, whether or not the DCGL meets the limit. You can obviously do that, because as I said
earlier, in step four, which is actually doing the dose analysis, the dose analysis and coming up

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1 with the DCGLs is the same process.

2 But in some cases, and I didn't really want to get into this in too much detail, but
3 in some cases, you can't release your site based on the DCGLs alone. You're going to need to
4 do a dose analysis, because the DCGLs, as you know, in MARSSIM, it only applies to surface
5 contamination. So if you've got sub-surface contamination or you've got ground water
6 contamination, you really need to look at the doses from the whole site.
7

8 So you need to do a dose analysis to see whether or not you're going to meet
9 the 25 millirem. You're still going to need to do some type of survey after you've done your
10 remediation to make sure that you meet the -- I mean, whether or not -- you've still go to do
11 some type of survey at the end, but in terms of determining whether or not you meet the rule,
12 you're going to need to do a dose analysis.
13

14 If you've got sub-surface contamination or you've got groundwater
15 contamination or some combination of that, and so this approach here or this framework is
16 geared to actually handle both doing the dose analysis and deriving the concentration limits.
17

18 I don't know if that answered your question or not. He's suggested we replace
19 box number five with MARSSIM.

20 MR. DUVAL: I'm just making a direct suggestion, as a member of DOE
21 representative work group, that that box, in my opinion, should be labeled MARSSIM and one
22 maybe should consider whether that's appropriate or not.

23 MR. THAGGARD: Any other questions, comments? Paul?

24 MR. GENOA: Yes, Mark, thank you. Paul Genoa, with NEI. I have a question
25 or a comment that applies to two areas in the presentation that I thought were very thoughtfully
laid out.

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You alluded to both the building occupancy scenario and the agricultural
scenario.

MR. THAGGARD: Yes.

1 MR. GENOA: And I know from previous workshops, we've dealt with some
2 issues regarding what some of the real dose drivers are under those two scenarios and we've
3 discussed, for instance, that in the building occupancy scenario, at least for certain isotopes, that
4 resuspension factor is a real driver.

5
6 In an analogous situation, under the resident farmer, the actual, for certain
7 isotopes, the amount of soil, contaminated soil adhering to the leaves of the crops tends to be a
8 driver in another scenario.

9 We've discussed different approaches to going out and analyzing and
10 researching and getting better numbers.

11 My comment is that, in fact, you could do that, but you are looking at second and
12 third order issues. You have go down and spend a lot of time and money and effort to
13 understand better and perhaps still have some experts disagreeing back and forth on whether
14 that's the right resuspension factor or this one is.

15
16 My comment is that there may be first order issues that you could address up
17 front that would probably say we don't need to go there. My example would be, for instance, in
18 the building occupancy scenario, worrying about the resuspension off the walls may be a moot
19 point in a structure like a reactor building or a nuclear facility where walls have been scabbled,
20 because the probability of someone occupying that building without doing some remediation,
21 without painting the walls, putting in new flooring, putting in ceilings, making it a habitable
22 environment to work in, the probability of that is very great and the truth is if you accept any of
23 that, you would realize that the resuspension factor probably gets driven to zero under those
24 scenarios.
25

In an analogous way, in the resident farmer, the assumption is that you're going
to eat the vegetables without washing them. Again, a first order premise is the probability today
of people eating all their vegetables without washing them.

So perhaps approaching those scenarios at a first order level obviates the need

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1 to go down and do grass roots research into how much strontium gets into the dirt, gets onto the
2 leaf, stays there forever, et cetera.

3 MR. THAGGARD: I think the question is whether or not there needs to be some
4 modification to the scenarios, to the default scenarios. I think the idea in coming up with these
5 scenarios, they were intended to be somewhat conservative, with the idea that, first of all, we're
6 looking at long timeframes. So it's difficult to predict what could happen at these sites over a
7 very long period of time.

8
9 The way we were looking at it was that we would give people the flexibility on a
10 site-specific basis to change the scenarios as they see fit. Obviously, and I think we've touched
11 upon this a little bit in the last workshop, that if you've got a site where you can't use the ground
12 water, that might be reasonable justification for excluding the ground water pathway in the
13 residential farmer scenario.

14
15 So the framework -- the way we went about this was we were trying to set up a
16 set of scenarios which we thought would be prudently conservative and then allow flexibility for
17 people to change those scenarios for their particular site as they see fit.

18 Now, the number of permutations that you can go through to try to figure out,
19 well, for this particular area, maybe we should do this, I mean, you could -- I don't know how
20 fruitful that would be, whether it's better to just give people the flexibility to change it on their
21 particular site or to try to go through a number of different permutations on for certain areas, you
22 can have this type of residential farmer, and certain areas, you have this type of building
23 occupancy.

24 I don't know how fruitful that would be at this point. I don't know if you
25 understand what I'm saying. But we have given some thought to changing those flexible
scenarios.

MR. GENOA: Mark, if I could respond, I'll be very brief. I appreciate what you're
saying and I absolutely understand that there is some flexibility, and an issue like is there

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1 potable ground water under the site, and that's a site specific issue, and, yes, I appreciate that
2 we need to demonstrate that we're using the right scenario.

3 But for the two issues that I identified, those are generic issues. I wouldn't
4 expect an individual licensee to come in and say, well, you know what, in reality, the probability
5 of people washing their vegetables is 80 percent of the time; therefore, I'm going to apply some
6 factor. That's probably not appropriate for an individual.

7 And I would just say that particularly before you spend resources on lower tier
8 impacts to that, that you would explore whether or not the actual scenarios described --
9 obviously, they're reasonable conservative or they're conservative. The question would be, are
10 they reasonably conservative and is there some room there to adjust.

11 MR. THAGGARD: That's nary a debate, quite frankly.

12 MR. GENOA: Thank you.

13 MR. THAGGARD: Yes, Sam.

14 MR. NALLUSWAMI: Sam Nalluswami, NRC decommissioning group. Mark, on
15 the step four of the framework, it has two slides, number two of the two.

16 MR. THAGGARD: Yes.

17 MR. NALLUSWAMI: Under the different transport pathways, what is your
18 thought on including sediment as another transport pathway?

19 MR. THAGGARD: Do you mean like surface runoff?

20 MR. NALLUSWAMI: No. Sediment transport.

21 MR. THAGGARD: Well, certainly, that could be a pathway. This wasn't
22 intended to be all encompassing and, in fact, it certainly could be a transport pathway. In fact,
23 that would be one area where a code like D&D and RESRAD would not be appropriate.

24 If you've got a case on your site where you could potentially have contaminated
25 sediment running off the site, then neither one of those codes are capable of handling that and
you obviously need to use some other type of code to model that.

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1 But that list I gave was not intended to be all inclusive. I should have pointed
2 that out.

3 MR. NALLUSWAMI: Are you familiar with any codes to handle that sediment?

4 MR. THAGGARD: Well, there are some codes. I can't name any off the top of
5 my head, but yes, there are a lot of codes that can deal with sediment transport. It's not that
6 uncommon of a phenomena.

7 MR. NALLUSWAMI: Thank you.

8 MR. THAGGARD: Henry?

9 MR. MORTON: Henry Morton. I think when we looked at the sediment
10 transport years ago, I think one of the codes that may handle it is the LABTAB and some others.
11 But when we looked at it years ago, it turns out not to be one of the prominent pathways.

12 So eventually this, I think, is the reason why it's dropped generally the volume.
13 When you look at what can the expersion of the sediment be, that is, the degree to which it's
14 direct personal exposure, the degree to which some bottom feeder aquatic animal that's
15 exposed to it and is eaten, turns out eventually not to be -- I think not to be one of the prominent
16 pathways.

17 MR. THAGGARD: Okay. Good point.

18 MR. CAMPER: Henry, before you go, would you identify for the record who
19 you're with?

20 MR. MORTON: I'm an independent technical consultant.

21 MR. CAMPER: Thank you.

22 MR. JOHNSON: Are there any comments from the state groups or other
23 people?

24 MR. THAGGARD: Thank you very much.

25 MR. CAMPER: Okay. The next topic on the agenda is our round table
discussion on the management of rubblized concrete. NRC staff, interested stakeholders, if we

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1 have any stakeholders that want to play an active role in this discussion, we'd like for you to
2 come on up to the table, if you would. I trust Dave Fauver is coming to the table.

3 As I mentioned this morning, this concept of rubblization of concrete, it's an
4 emerging issue. We're going to have an overview provided about it to set the stage for our
5 discussion.
6

7 The staff is very much in a listening mode. I want to reiterate that from this
8 morning. We are preparing, in the midst of preparing a Commission paper for Commission
9 policy consideration, because we see this as an issue that has generic implications, obviously,
10 and we want the Commission to provide the policy perspective on it.

11 So, again, this is an ideal time for the discussion, so the staff can factor in what
12 we're going to hear today. So with that, Paul, we'll ask for the overview.

13 MR. GENOA: Thank you. Again, Paul Genoa, with NEI. What I would like to
14 do, I have a very brief presentation. I want to apologize up front. I brought 50 copies of that
15 presentation and they're outside, for those of you who want to use it, but there seems to be more
16 than 50 people in the room. I will be happy to make that presentation available to anyone who
17 doesn't get it and I can be reached at PHG@NEI.ORG.
18

19 Can everyone hear me all right? Is that better? I want to thank you for this
20 opportunity. Again, my name is Paul Genoa. I'm with the Nuclear Energy Institute. After my
21 presentation, we do have some utility members of our task force, we've mentioned before, that
22 want to provide just some insights into this concept.
23

24 I want to state up front that this is a relatively new concept for us, that we are
25 evaluating its applicability. We're sort of brainstorming different opportunities. And I want to
start out by saying that, in fact, this issue is part of what I think is a pretty exciting story and I
want to share that with you very briefly here today.

Fundamentally, what are we trying to accomplish here. We have power plants
that have provided power for the public. They've run to a point where it's time to decommission

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1 those facilities. The goal is to decommission those facilities safely, and that's safely for the
2 public at large around the facility, as well as for the workers who are doing that decommissioning
3 work. That's not just the radiological safety, but the industrial safety, as well. It's an important
4 concept.

5
6 I think we're doing some really innovative things under this new rule to
7 accomplish that goal; to get the job done, get it done safely, and get it done efficiently so that,
8 one, we don't waste a lot of resources and, two, we make those properties available for other
9 societal activities, whatever they are, and we have a range of those.

10 So I want to tell you about how we're moving down that process. Now, the main
11 thing, of course, is getting rid of all the radioactivity and we're doing that aggressively with
12 chemical decontaminations, things that really weren't well developed years ago, but are being
13 put in place today to remove the bulk of that activity.

14
15 That allows us to go in and use sophisticated instrumentation and identify the
16 hot spots, the activity that's left, and cut those components and pipes out so that the radiation
17 exposure to the worker is diminished and allows for the accurate characterization of the
18 remaining residual activity, and that's what some of the folks have commented on today. They
19 want to make sure that we do a good job there and I want to assure you that that's what our goal
20 is.

21
22 Once that characterization is done, the remediation is done where appropriate,
23 and then it's a decision. If the decision is made to go to greenfield, to remove those buildings,
24 well, then we've got to knock them down. When you knock them down and you end up with a
25 bunch of rubble, you have a choice. You can move the whole world away from there and put it
somewhere else or you can figure out how to beneficially use some of that material to fill in
whatever voids in landscaping there needs to be done to make that site suitable for reuse.

So the rubblization idea seems to have some merit, and we're going to explore
some of our thoughts about that with you today.

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1 I've turned this on, but it isn't functioning. Is there another switch? Maybe it's
2 that one. What's this one? Now, this is such a new concept that we're not really sure how to
3 spell it. So we're not sure about rubblized, but we understand that RSI came up with the word
4 first, they dropped the E, so I'm going to follow suit, but I'm not really sure. It's not in the
5 dictionary or my spell-check, so you're on your own.

6
7 MR. PITTIGLIO: It wasn't in ours either.

8 MR. GENOA: What are we talking about? Well, it's really pretty straightforward.
9 We're talking about demolishing the unwanted concrete structures at a decommissioned nuclear
10 facility. We're going to use some of the resulting rubble from that demolition for beneficial fill
11 material on-site. There will be basement structures and various voids that need to be filled. You
12 can bring in other fill from somewhere else and put it in there or you can use what's already
13 on-site.
14

15 Finally, we're going to incorporate the residual radioactivity associated with that
16 level into all the dose assessment scenarios, because that's what needs to be done.

17 MR. PITTIGLIO: So the question we would have on that slide is the timeframe
18 for which you're talking about is prior to license termination, is that correct?
19

20 MR. GENOA: The timeframe for what?

21 MR. PITTIGLIO: For the rubblization. It's prior to the license being terminated.

22 MR. GENOA: In this context, it is. Although I guess I would say we do have
23 some folks up here that have looked at rubblization and what are the impacts afterwards. So
24 different people are looking at this from a different perspective.
25

One activity before license termination would be conducted by radiation trained
workers. So there is potentially an advantage there. The other would be done after license
termination by the general public, and there is an implication there we will get to.

So why do this or why would you want to do this? Well, it's important to
understand that first you have to make a decision of what your end point is. For some sites,

1 there is a belief that the buildings will have value and you're not going to knock them down, so
2 why would you rubblize them. You won't. But if you have made the decision to remove the
3 buildings, and there are a lot of good reasons to do that. First of all, reactor type buildings aren't
4 necessarily the most useful office buildings or resident homes or light industrial facilities. I
5 mean, they're huge strange things with no windows.
6

7 The other thing is there are implications of leaving that on-site. First of all, it
8 may be unsightly, it may not be a very safe thing to have in your neighborhood, particularly if it's
9 not being used. That has all kinds of implications. You've been in brownfield areas where you
10 have residual buildings that are left and they got occupied by all kinds of people and whatever
11 happens, it's not necessarily pretty.
12

13 There are liability implications. There's a lot of reasons why you might want to
14 remove it.

15 Virtually, many of these facilities are fairly park-like and have actually parks
16 around them and removing the buildings allows that facility to be used or that land to be used for
17 beneficial purposes.

18 So once you've made that decision to remove it, then the rubblization approach
19 is a logical approach that follows, because, one, you're going to need fill material anyway to
20 grade the facility; two, it allows you to reclaim the steel rebar that may be within there, so there
21 are some resource considerations. It avoids the additional transportation impacts of moving sort
22 of a mountain of rubble from here to there. I mean, what does that benefit?
23

24 And it also -- kind of where we are going here, it generally would tend to make
25 the residual contamination inaccessible. If you rubblize the material and put it underground, it's
not out there on the building surfaces to be contacted by the public. So that's a way to look at it.

It also provides some potential cost savings and, of course, that's of interest to
all of us, not just the utilities, but the public at large.

Well, is this really a new idea? Is this something we scammed up because of

1 this rule? And the answer is no. This is a routine general industry practice for demolishing
2 buildings. You come in, you knock them down whatever way or you blow them up and let them
3 fall down, and when you're done, you remove the excess material, you grade the facility, and
4 you go on and do something valuable with the property. Much of the rubble will stay on-site in
5 basements and structures and low spots and whatever else.
6

7 So it's not a new thing, but it is new for us. Some utilities have done this under
8 the older approach, but under the new rule, nobody's done it yet and that means a dose
9 assessment approach and we're trying to work our way through that and we're going to share
10 our thoughts with you.
11

12 Well, what are the dose modeling implications? I think Mark, in his last
13 presentation, did a pretty good job of identifying a few places where this concept starts to
14 intersect with dose modeling.

15 Fundamentally, the principle is that rubblization allows you to model the final
16 configuration of the site and that really is true to the spirit of the rule, to actually look at the
17 building intact, knowing that it's not going to be there later, sort of is a sidetrack on that.

18 This is a much more direct thing. If it's going to be a greenfield when you're
19 done and the implications from the dose modeling are for resident farmer or whatever they are,
20 intruder, those things need to be established and if they meet the criteria, they meet the criteria.
21 So it's within that spirit.
22

23 But clearly there are some issues and one of them is the radioactivity
24 distribution. I think Mark pointed that out in one of the slides. You need to address and define
25 what is an acceptable radioactivity distribution within that material; how hot can the hot spots be,
are they, is there a blending issue that needs to be dealt with and those issues need to be
addressed.

This is a good opportunity for us to start talking about that.

The resident farmer scenario. Once it's rubblized and it's in its final

1 configuration, you're going to go through the same kind of dose assessment that you would.

2 There are some differences. As Mark pointed out, the default parameters probably aren't going
3 to work for you. You are going to have to do some leaching issues. You're going to have to look
4 at it from a different perspective. But it is not an insurmountable task.

5
6 As a matter of fact, in some cases, it almost simplifies things. But it is important
7 to note that under these scenarios and if we look at hot spot issues and the next issue I'm going
8 to address, resident farmer may not ultimately end up being the limiting scenario.

9 So what might be? Well, intruder scenarios, and perhaps that's the wrong word.
10 I chose that from other experience, but there may be other appropriate words. What I'm really
11 getting at is you need to evaluate potential redistribution scenarios, how you might, in the future,
12 or how someone, in the future, might move this material and put it into some configuration that
13 actually yields a dose higher than what you release the site at. We need to prove that that won't
14 happen under any reasonable scenario.

15
16 Well, what are appropriate intruder scenarios? We talked about a couple
17 earlier. I would say that they're any that are reasonable. You have to think about it. Fortunately,
18 from my perspective, rubblized concrete is a pretty simple thing. It doesn't have a lot of intrinsic
19 value. I mean, you don't take it home and use it as a paperweight. It isn't really very suitable for
20 reuse in many different ways.

21
22 In fact, the NRC, in a draft NUREG, and I emphasize it still is draft, but has done
23 a pretty credible job at laying out what the reasonable scenarios for the reuse of concrete are.
24 Matter of fact, in quote, they say that they have provided a defensible basis for demonstrating
25 appropriate exposure scenarios for contaminated or recycled concrete.

That's really what we're talking about; is there some pathway where people
would dig the stuff up and then recycle it in some fashion that causes a new critical exposure
group.

Well, under the NUREG and the studies they've done, the staff went out and

1 talked to the American concrete recycling industry and they learned a lot about it and
2 fundamentally, recycled concrete from structures like this is used for three purposes. It's used
3 for road beds, it's used for essentially blending with asphalt to stabilize the asphalt, and it's used
4 for non-structural concrete applications.
5

6 They found that it is never used in structural concrete applications because it
7 doesn't work that way.

8 Now, we looked at that -- and they also said that there is a credible disposal
9 pathway that you have to evaluate, that ultimately the realistic situation is someone might come
10 in, dig this stuff up, move it to an industrial landfill, because, by the way, you're not allowed to
11 just do anything you want with rubble. There are state laws that tell you what you can and can't
12 do. So this would have to go to industrial type landfill and you might have to do a dose
13 assessment based on some future resident farmer on a landfill.
14

15 So that would be an approach. But beyond what was in NUREG-1640, we kind
16 of brainstormed to think about, well, what other credible scenarios are there out there. Well,
17 there is excavation, that I just discussed. I believe there is erosion control issues. I mean, it is
18 not uncommon to see rubblized concrete or slabs or concrete used as rip-rap or used as erosion
19 control in coastal areas or along rivers or whatnot, so that's maybe a credible scenario.
20

21 Now, figuring out the occupancy time and all that is a chore that the licensee has
22 to take on and figure out what makes sense.

23 Perhaps, we have actually heard this from NRC management, they could
24 envision perhaps a jetty or a pier being constructed out of this material, and perhaps you'd have
25 to assume some occupancy time. Fishermen out on the pier, the jetty, and being exposed to
this material.

So all of those kind of exposure scenarios need to be evaluated to see whether they're credible
and then what the dose at would be and whether, in fact, they are limiting in some fashion.

When we get into the discussion later, I will have someone share --

1 MR. PITTIGLIO: Before you leave that slide, could I ask you one question?

2 MR. GENOA: You bet.

3 MR. PITTIGLIO: When I looked at the potential uses that you have on there, it
4 kind of indicates to me that it allows for a significant variation in the potential size of the
5 rubblized concrete. For example, if you're using it as rip-rap or it's for jetty compared to fill for a
6 highway construction.
7

8 So when I -- and I will ask you this question. I don't know what the answer will
9 be. But when we went back to the other slides, you did not identify a range of size in rubblized,
10 even though indicated that you might remove the rebar.

11 MR. GENOA: Right, and I don't know the answer to the question. I do know
12 that most states have rules on what is acceptable rubble from a demolition project. I would just
13 say that we would be constrained to that.
14

15 I do know that in one state, for instance -- excuse me. You're also constrained
16 by technology. Some technology we know of requires pieces to be no bigger than a certain size,
17 approximately a 24-inch size, before it could go through a machine and get crushed and
18 segregated.
19

20 Our preliminary evaluations seem to indicate that certain scenarios are relatively
21 insensitive to the size of the resulting concrete rubble, but perhaps some of these intruder
22 scenarios might be sensitive to it, and so that would have to be evaluated and documented and
23 you'd have to accept that, if you believe the documentation.

24 So we don't know what it would be and it may be different for different people,
25 as you pointed out. I think as I was going to point out, we have one fill in here for these question
marks that I will ask Eric Goldin to share with you when he goes through, and it will show that it
might be a very big chunk for that particular scenario. Definitely a key issue, has to be
addressed.

Is it ALARA? And we thought it was important to kind of evaluate this and there

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1 is a lot of confusion about ALARA, occupational ALARA versus subpart (e) ALARA and how you
2 do it. But fundamentally, in our opinion, as you move down this path, you make a determination
3 of which decommissioning approach you're going to take and you document that for reactors in
4 a PSDAR and document that that's an acceptable path forward.

5
6 Once you've done that, your subpart (e) determination really tells you how far
7 you need to remediate that approach to meet the ALARA principle, and that's a cost-effective
8 dose reduction approach that we're all pretty comfortable with, but it's within that scenario, within
9 that approach.

10 Now, that being said, we believe that it's inconsistent to try to derive an ALARA
11 comparison between two different approaches. For instance, I want to leave the building up,
12 there is a certain ALARA evaluation associated with that. Another approach is another licensee
13 wants to knock the building down, there are very good reasons why he would want to do one or
14 the other. They're independently sound reasons.

15
16 You don't compare the ALARA remediation issues between the two. That would
17 be inappropriate. Rather, within either one of those, you would conduct ALARA evaluation to
18 determine whether you had gone far enough in your remediation to meet the ALARA principle.

19 In conclusion, because I did promise to be brief, we believe that rubblization
20 appears to be a viable and promising decommissioning approach. It's early, but that's our initial
21 thought. We believe it's consistent with the dose based rule. We believe it provides some
22 health and safety benefits.

23
24 We believe it provides for beneficial reuse of the material and we believe it has
25 a potential to provide some cost savings.

With that, I'd certainly take any questions, and then I know that there are some
utility folks here that would like to share what their perceptions are on what an approach to
rubblization would be.

MR. JOHNSON: Before you begin with the questions, we made extra copies of

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1 the slides that are available out front, if you didn't get one the first time around.

2 MR. PITTIGLIO: Paul, I'm going to ask you one more question.

3 MR. GENOA: You bet.

4 MR. PITTIGLIO: I noticed that you indicated in one of the slides the recovery of
5 the steel rebar.

6 MR. GENOA: Yes.

7 MR. PITTIGLIO: The question I have for that or related to that is under the
8 current regulation and under the current reactor, we basically have a zero detectable for release
9 prior to license termination.

10 MR. GENOA: That's correct, and that would have to be met.

11 MR. PITTIGLIO: Okay. Unless you left the rebar on-site until after the license
12 was terminated.

13 MR. GENOA: That's true, but I guess if you envisioned leaving it one
14 configuration and digging it up the day after and moving it off-site, in fact, you ought to be
15 analyzing that scenario in your dose modeling. We recognize that some rebar may be activated.
16 So you're going to have to do the right analysis, the right survey, really know your inventory, and
17 it either is or it isn't, because we don't have a clearance rule today.

18 MR. PITTIGLIO: Thank you.

19 MR. JOHNSON: Paul, for the sake of context here, we produce some default
20 values for surface concentrations in a Federal Register notice, I guess it was the end of last
21 year. And I think for Cobalt-60, the default value for Cobalt-60 was something around 7000 dpm
22 per a hundred square centimeters.

23 With your concept of rubblization, what kind of surface activities would you be
24 proposing here in terms of order of magnitude with this concept?

25 MR. GENOA: I don't have an answer for that, because I haven't done the
evaluation. Others might. But I guess I would say that we have to be careful not to mix apples

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1 and oranges, because the numbers printed were conservative default values for a building
2 scenario situation, totally different than a resident farmer situation, with the material
3 underground.

4 So the bottom line is the dose needs to meet the required limits. But I haven't
5 done the evaluation to see what that -- and the reality is that the analysis for resident farmer is
6 pretty straightforward and actually could probably allow fairly high values, but I'm not sure that's
7 going to be limiting.

8
9 MR. FAUVER: We don't know yet where that's going to come out. We're in the
10 middle of doing that work. We're performing some site-specific studies and that kind of thing.
11 We just don't know.

12
13 MR. JOHNSON: Well, I did some simple calculations and it seemed like if you
14 were going to justify or use the developed surface limits based on a disposal scenario on a
15 volumetric basis, depending on the size of the concrete wall and the layer of contamination, it
16 would be easily that you could get 20 to 50 times the higher doses for surfaces than the default
17 values that we published.

18
19 MR. FAUVER: That's not unimaginable, I assume. However, it would still be
20 meeting the dose limit. I think as you all move forward on your development of this Commission
21 paper, and that's what Larry's lead-in, was that we were going to discuss this, Larry Camper, this
22 issue about going back to these numbers and I think Paul mentioned that under this slide of
23 ALARA, is extremely important, this idea of comparing the inventory is just not consistent with
24 the rule.

25
It's inappropriate. You can't say that one or the other, because of the inventory
remaining, because it's a different dose assessment. There is no relationship between those
two configurations and there is nothing in the rule that would compel you to look at those two
things, and there is nothing from a health and safety perspective that would compel one to look
at those differences in inventory, because it's a dose-based consideration.

1 And in the case of certain reactors that have elected to demolish their building,
2 there is no probability, zero probability of this other dose assessment, in fact, happening or being
3 the case, the building occupancy scenario.

4 So I guess I would ask you to carefully consider the way that you structure your
5 argument to the Commission in this regard related to inventory, because there is no place in the
6 regulations or guidance or even in health and safety space to argue that the comparison --
7 looking at inventories is a valid way to evaluate the idea of an end point of decommissioning
8 being to demolish a building versus the end point of decommissioning being building occupancy.
9

10 So looking at those from an inventory perspective, I think, is invalid and it
11 doesn't have any real significance or argument to it.
12

13 MR. PITTIGLIO: I think the point that Tim is trying to probably make, though,
14 and we've looked at some other scenarios, I know Mark and I have, that -- and I know that on
15 the slide up there, there was an indication there was a cost savings, and it does appear that the
16 established limits that will be used for the rubblized -- and I'm not sure what the definition of
17 rubblized is yet -- is significantly higher than the limits that were posted in the Federal Register
18 for surface contamination.
19

20 MR. FAUVER: Maybe. For building occupancy, so that's --

21 MR. PITTIGLIO: As compared to building occupancy.

22 MR. FAUVER: Building occupancy. It's not a surface contamination number.
23 It's a number derived assuming that a building is standing, the people are in the building, that
24 they inhale the resuspended air, that they touch the walls, and they get external radiation.
25

All of that is completely inappropriate and invalid, inapplicable, once you
rubblize -- one you demolish the building. Maybe that's a better term, demolishing the building,
you end up with these pieces of material, concrete, whatever it may be.

That's the end point and the goal of the decommissioning project, to evaluate it
based on a standing building, is not only incorrect, but it's technically wrong. Well, how can we

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1 go do a dose assessment for a standing building and say you're meeting 25 millirem, when we
2 know the building is not going to be standing? Why would I do an assessment like that?

3 MR. PITTIGLIO: Let me ask you one other question on this rubblized approach.
4 My understanding is that whatever the size of the rubblization, that the intent is to take rubblized
5 concrete and to backfill the existing structure to a certain amount of distance below grade and
6 then grade the facility off. Is that correct?
7

8 MR. FAUVER: That's one option, yes.

9 MR. PITTIGLIO: So that basically the foundation and possibly the exterior walls
10 remain in place from a certain elevation up to or below grade.

11 MR. FAUVER: That's an option, yes.

12 MR. PITTIGLIO: Now, in that case, I would assume somebody is going to do
13 some kind of occupancy scenario to go in and look and see if the rubblization was removed in
14 the walls and the structure and the base matter is still there.

15 MR. FAUVER: I'm not sure I --

16 MR. PITTIGLIO: If the size of the rubble is small, you're leaving part of the
17 structure in place.
18

19 MR. FAUVER: That's a good question and that's something I guess that would
20 need to be considered whether anybody really believed that this demolished structure, with
21 these walls remaining in this basement area, that's filled with sand and the demolition concrete
22 debris and everything else, would ever, in the future, be excavated, somebody would pull out all
23 this rubble, stack it off to the side, and somehow use that as some basemat for a future building,
24 that then somehow somebody would then occupy those areas.
25

I think an intuitive sort of common sense look at that says no, that that's not a
feasible future use, that somebody is going to go in and start occupying this structure.

MR. PITTIGLIO: If you look at a basemat which might be as much as much as
ten or eleven feet thick, depending on the reactor, and an extensive mass of concrete, maybe

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1 the walls wouldn't be used, but it's not inconceivable that it could be used, somebody would go
2 in with a bulldozer, knock out the rubblized material and use that as the foundation for some kind
3 of commercial or residential or industrial building.

4 MR. FAUVER: It's 20 feet underground. We know that it's 20 feet underground.

5 MR. PITTIGLIO: Twenty feet below grade.

6 MR. FAUVER: Below grade, yes.

7 MR. PITTIGLIO: Existing grade.

8 MR. FAUVER: That's open for discussion. That's a valid point.

9 MR. CAMPER: But you have two issues going on here. One is a possible
10 scenario of the future and the other is the definition of rubblization itself.

11 Now, this remaining structure that Larry is referring to, that's not conceptually
12 within your definition of rubble, is it? It's not in the box we will call rubblization, or is it?

13 MR. FAUVER: Well, the question becomes one of -- at this point, it's one of
14 scenario. You're going through this whole process of demolishing this building using these
15 customary and accepted construction practices.

16 What you're left with are these pieces of demolition concrete and they're in this
17 configuration filling these basements. Now, when you say we talk about rubble, maybe rubble is
18 the pieces, but then you start -- really, it's a scenario issue.

19 So the question being raised is valid and I think that has to be addressed and
20 worked through, whether there is -- whether it is credible and reasonable to believe that that
21 area would ever be occupied in the future.

22 MR. CAMPER: But I see another issue. The scenario issue I agree with, but I
23 think in terms of defining -- one of the things we need to know from you is if we ask -- if we say
24 what is rubble, most of have something in our mind in terms of it's a pile of broken-up concrete.

25 MR. PITTIGLIO: Not to exceed three inches in diameter.

MR. CAMPER: Now, most of us, I think, would not inherently jump to the

1 conclusion that a standing wall or structure, even though it's ten or 15 or 20 feet below grade, is
2 rubble.

3 Intuitively, you don't jump to that conclusion.

4 MR. FAUVER: I agree with that.

5 MR. CAMPER: But you might if you decide to define it that way. I'm just saying
6 that intuitively, you don't get there.

7 MR. FAUVER: And I don't think there would be any attempt to make that part of
8 the definition. I think what you're going to find is that at least half of that building depth is going
9 to be under -- is going to be below grade, below water level.

10 So you're going to have this -- not only is it going to be filled with this material,
11 but basically, as it stands right now, the bottom of this containment shell is some, I'm guessing
12 here, at least ten feet below the water level.

13 The only thing keeping the water back is the steel shell itself and we have every
14 intention of poking holes in that thing so it then can allow this water to flow through, is what the
15 thoughts are right now, that you don't want to just have this thing sitting sealed off from the
16 environment, that's not productive for a number of ways.

17 So what you're going to end up with then is this conceptual model, to use Mark's
18 terminology, and the conceptual model is this concrete below grade, that's filled up with water,
19 essentially, and you've got the surfaces and it's filled with this concrete debris.

20 Now, the question becomes how does a person get dose from that. These
21 standing structures, it turns out that the dose pathway is identical to the concrete itself. The
22 pieces of concrete, the rubble, in the sense that's what's going to happen is it's going to contact
23 the water, diffusion is going to allow this material to come out, and then this water will flow in
24 some way or another or stay in place one way or another.

25 So the pathways are identical in terms of the dose assessment conceptual
model.

1 MR. PITTIGLIO: Only if you assume that that area will not be reoccupied.

2 MR. FAUVER: Right. So then let's think about the reoccupancy. The guy is
3 going to go in, he's going to dig it up, he's going to reseal it, so that now you can -- he's going to
4 pump down all this water, pull everything out, somehow get in there and reuse it as an occupied
5 building or some sort, within a time period that's consistent with the half-life of the material that
6 you've got.
7

8 This isn't a thousand-year assessment. This is a near-term assessment with the
9 Cobalt and the cesium, with primary radionuclides. So you've got to envision all this happening
10 within some relatively short timeframe, 30-40 years, something like that, before somebody is
11 going to do this.
12

13 MR. PITTIGLIO: It's not inconceivable to me that for a nuclear plant that might
14 even have a switchyard that remains in place, that may remain in use, that that wouldn't be an
15 ideal foundation for which to put some additional switch -- I mean, for some commercial use,
16 butler buildings and support the use of whatever it is as a substation.

17 MR. GENOA: And I guess those things need to be evaluated. It would be my
18 assumption that the utility going through decommissioning would be exploring the resale and the
19 reuse opportunities for that site, and many of them will be industrial facilities, as you pointed out.
20

21 I don't think they'd go to the trouble to rubblize and fill it in, because that takes
22 away the value, if you were going to reuse it or consider reusing it in that fashion.

23 MR. FAUVER: There has to be some reason here in terms of probability of
24 occurrence and I think just some basic common sense is saying that the probability of
25 recurrence of this scenario that you've just described, this human behavior, doing all these
things, pumping the water out, taking the concrete out and doing this, just to build a butler
building, within a 30 to 45 year period, for example, where the radioactivity has gone to half to
one-quarter of the original level by decay, is implausible, almost.

MR. PITTIGLIO: I think that the issue goes back again to what Larry Camper

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1 said. This thing has caught me in a position where I'm a little bit confused, because I keep
2 hearing the definition of rubblized concrete meaning stones, blocks, bricks or larger pieces.

3 MR. GENOA: Right.

4 MR. PITTIGLIO: And I can understand, I can accept that, if somebody was to
5 tell me, well, we're using the surface contamination limits for the structure that remains before
6 we go in and put the rubblized material in it. The heartburn that I have is that I'm not clear on
7 what the definition of rubblized is. It now appears to be defined as small pieces of concrete
8 inside of an existing structure.
9

10 MR. GENOA: My presentation was an attempt to show that that's not the only
11 approach; that rubblization we're just starting to evaluate. That does appear to be one person's
12 approach and we've heard -- and we would like to discuss some other approaches.
13

14 I don't think there is a definition of it, that we need to build one.

15 MR. FAUVER: I think the key, though, is we're talking about this rubblization as
16 if it's some thing in and of itself. What we're really talking about here is building demolition.

17 MR. PITTIGLIO: Building what?

18 MR. FAUVER: Building demolition.

19 MR. PITTIGLIO: Partial demolition.
20

21 MR. FAUVER: Well, yes, standard building demolition, below grade, partial
22 demolition, if you want to call it that. Then one has to go back and say how do I do a dose
23 assessment for the building demolition. We have this standing building dose assessment
24 methodology, but I can't use that. That's invalid, because the building is not standing.
25 So now you have to take one step back and say, okay, what's my conceptual model; okay, I've
got this below grade area, three foot below grade, with a cap on it and these pieces of concrete
that may be this big or this big or this big, but that all is accounted for in the modeling, and then
I've got these kind of walls that have been scabbled, to some extent, and all the majority of the
contamination taken out perhaps, depending on how that model turns out, that's my conceptual

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1 model.

2 So now I have to figure out how there is going to be a dose from that. That's the
3 process. More demolition, not rubblization. You get confused about, well, let's see, rubblization,
4 does that mean we're only talking about pieces of rubble? That's not the point.

5 What we're really contemplating here is building demolition.

6 MR. PITTIGLIO: And if you were telling me building demolition meaning --
7 including the basemat and the exterior walls, then that's a standard definition by construction or
8 demolition.

9 MR. FAUVER: Well, I'm not sure. I'm not sure that when you knock down a
10 building or a skyscraper, that you go under grade and remove that structure. Matter of fact, I
11 don't think you do.

12 MR. PITTIGLIO: Well, the matter of fact is that building codes will not allow you
13 to use the existing structure on any building in the United States.

14 MR. GENOA: Then that argues that it won't happen at a nuclear plant either. I
15 wanted to point out also that there are -- that this concept -- you might not only put the rubble
16 into a containment sub-basement.

17 MR. PITTIGLIO: You might put it in a turbine building basement.

18 MR. GENOA: You might put it in a hole in the ground that used to be the turbine
19 or some other structure. In other words, if you need to grade the facility, you have a choice of
20 using the demolition material, if it's safe, that doesn't mean the wood and the metal and all that,
21 but the concrete rubble, and if it meets the state's requirements, or you can go somewhere else
22 and get clean fill and bring it in and take the other stuff and take it out.

23 So we're trying to evaluate where that makes sense. So we can broaden our
24 thinking to include more than just in the building.

25 MR. NELSON: Excuse me. Bob Nelson, with NRC. It sounds like we're getting
down really into the grass of some of these questions and I know there is at least one other

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1 gentleman I saw trying to ask one, and I'd suggest we move on and let other people ask their
2 questions.

3 MR. ROBERTS: Thank you. Rick Roberts, Rocky Mountain Remediation
4 Services. After you levelize the concrete, how exactly do you do a dose assessment? RESRAD
5 and D&D are based on soil and if you look at a resident or something else out there, it's based
6 on a soil type of dose assessment, when you get away from the building occupancy, and
7 rubblized concrete is not soil.
8

9 So have you all thought about how you're going to do a dose assessment if
10 you're not using RESRAD or D&D?
11

12 MR. FAUVER: Yes. We're very far along in that fact. We're probably 90
13 percent done at least with that assessment, and we're -- the simple answer is we're treating
14 concrete like concrete. Concrete is not soil. It's concrete. And if you've got concrete, then there
15 are certain ways that this residual contamination in concrete can end up getting into a pathway
16 that results in dose, and that's the evaluation.

17 MR. ROBERTS: So you don't use RESRAD or D&D to do your evaluation.

18 MR. FAUVER: Basically, if you can imagine this conceptual model in the
19 configuration that you're ending up with, you've got three foot of cover, it's all nice and green and
20 you've got this construction debris below grade, using standard customary construction
21 practices, and it's just like any other site that's not contaminated, a non-nuclear facility, what
22 pathways you really have.
23

24 Basically, you've got a ground water pathway, you've got the well scenario.
25 Once you pump, then you've got the irrigation scenarios. And you may have some buildup in
soil and some of these things that turn out to be trivial, but that's basically what you have, absent
the excavation or intruder scenario, which also has to be evaluated.

We have to look at both. They're different. Both of those scenarios are
different. But the configuration as left at the end of a project, a greenfield type configuration,

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1 you've got only a couple pathways, primarily drinking water.

2 MR. ROBERTS: And I guess I would submit that if you aren't using RESRAD or
3 D&D, in some way, if you're going to rubblize concrete, that I guess you would need some type
4 of detailed methodology that you would need to put in your guidance to state how you would
5 have to assess the rubblized concrete, because that would be an assessment over and above
6 the RESRAD or D&D analysis.
7

8 MR. FAUVER: It is, yes.

9 MR. ROBERTS: Thank you.

10 MR. NALLUSWAMI: I have a question to Dave. Dave, I understand that the
11 rubblization is breaking of the concrete walls into small pieces, am I right? And in that process,
12 the concrete, the contamination is going to be mixed up with the larger mass of concrete.
13

14 For example, you take a body of -- a small quantity of contaminated water,
15 chemically or radiologically, and mix that into a large portion of water, that gets diluted. So is
16 that a comparison?

17 MR. FAUVER: No, not really. It's not really like that. If you think about the
18 configuration of residual contamination at a nuclear facility, the majority of it, not considering
19 activated material, is in the first half-inch or so of the concrete, half-inch, quarter-inch of the
20 concrete.
21

22 Then if you were to demolish this building and end up with pieces of concrete,
23 what you're going to have is a bunch of clean surfaces and then you're still going to have this
24 residual contamination in this other surface, and these are going to be oriented on a macro scale
25 and mixed in and oriented all different ways, such that it is essentially a uniform mixture for the
purposes of looking at it kind of macroscopically, because you've got these surfaces, some are
down, some are sideways, some are up.

26 You've got hundreds and thousands of these pieces and it ends up being a
uniform mixture.

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1 However, we recognize that and we are not taking credit for that phenomenon of
2 mixing in the baseline dose assessment. We're assuming the configuration of the material
3 being on the surface of a number of blocks and looking at the leaching and diffusion from that
4 configuration.

5 We're not requiring this mixing somehow to homogenize anything for the dose
6 assessment.

7 MR. NALLUSWAMI: So you're not actually diluting then.

8 MR. FAUVER: No. No. There is no assumption of dilution in the assessment
9 whatsoever.

10 MR. CAMPER: You mentioned homogeneity. You're not assuming
11 homogeneity of the intruder scenario, correct?

12 MR. FAUVER: Well, for the intruder scenario, I believe that even the most
13 conservative assessment of some of the scenarios, like, for example, bringing the material back
14 up and building a slab on it, slab on grade construction or something like that, even in most
15 conservative conceptualization of that, there has got to be some mixing. You can't take a wall,
16 demolish it, put it in a hole, bring it back up and have all your surfaces lined up, all just like that,
17 so all the surfaces are up.

18 I would envision that in that particular scenario, you would assume that your
19 contaminated surfaces are different orientations and that then one could assume basically a
20 uniform distribution over the fill material, if you will, over some future slab structure.

21 MR. GENOA: If I could add to that. As we've pointed out, there are some
22 intruder scenarios that you'd have to look at. From a macro modeling scale, you could view this
23 as a sort of an inventory-based issue, because that's how it would move in sort of a slug flow.

24 But on some intruder scenarios, you could envision someone coming in contact
25 in some fashion with a discreet part. So as I point out, you need to deal with radionuclide
distribution within that and there's certainly -- you can't take this to ridiculous extremes. You

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1 can't somehow have one enormously hot thing and everything else not be hot and be safe.

2 There is some probability that someone would contact that. So there has to be
3 some reasonable range of distribution that's acceptable and that's --

4 MR. CAMPER: That's what I'm pondering.

5 MR. GENOA: Yes.

6 MR. CAMPER: Did I hear you correctly when you said that in terms of residual
7 contamination or, for that matter, dose rates that might exist in some of these discreet spots,
8 you've not yet determined what those might be?

9 MR. FAUVER: No. We will determine explicitly the activity and the distribution
10 of activity in the facility and the acceptability of we'll call them area factors, that Mark described,
11 will be a dose-based determination as to the acceptability of the distribution, the spot, whatever
12 you want to call it, and the acceptability for a given spot may be based on the intruder scenario.

13 In other words, that piece, it's on the wall, it's this big, it's got a certain
14 concentration, and that piece just goes through the system, gets dug back up and gets --

15 MR. CAMPER: Somebody takes it home.

16 MR. FAUVER: Somebody takes it home.

17 MR. CAMPER: Puts it in the backyard.

18 MR. FAUVER: Right, right. And so we'll have some credible excavation
19 scenario. We won't use the most outrageous scenario of a person sitting on a piece of rock for
20 8,000 hours a year, we're not going to do that one.

21 We will do a reasonable set of scenarios and those scenarios then are what's
22 going to drive all the way back to the remediation requirements on the building surfaces. So it's
23 one squared area that has a certain concentration that's going to deliver a small dose.

24 That will be how the distribution is justified and that's going to drive the extent of
25 remediation.

 MR. GENOA: To the extent that we've done some back-of-the-envelope calcs,

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1 it seems that from an intruder scenario, we're talking about worst case micro R per hour, not MR
2 per hour kind of dose rates. So we're way down there, not something that's immediately a
3 radiological hazard to someone.

4 These things have to be worked out.

5 MR. CAMPER: Right. A clear articulation of that.

6 MR. EID: This is Bobby Eid, NRC. I have a question regarding the use of
7 MARSSIM. Could you explain when you intend to use MARSSIM, after rubblization of the
8 concrete and the issue of the samples and variability on the samples, the number of samples,
9 sampling, whether you will be sampling from the surface of the irradiated concrete or you'll be
10 sampling through very large volume and then you will come with the concentration, which could
11 lead to the dilution issue that we are talking about?
12

13 MR. FAUVER: I won't go into all the details, but we're evaluating -- probably our
14 primary choice at this time is surveying the surface prior to demolition, and that survey could be
15 fully accommodated under the MARSSIM structure and it would involve area factors, as I just
16 discussed, that it will be dose-based. It will involve sample size determination and the exact
17 measurement technique we haven't firmed up yet as to whether that will be some type of surface
18 measurement or some type of, I don't know, in situ gamma spec or something, a number of
19 things that we're kind of thinking about.
20

21 But it will, in the end, correlate back to the real distribution of the activity that
22 we're dealing with, which is a quarter-inch to half-inch layer of contamination on concrete
23 surfaces. That's what we're modeling.
24

25 We're not modeling mixed up stuff. We're modeling the real configuration.

MR. PITTIGLIO: Paul, let me ask you one question, one more question. It
appears that, as we discuss the topic, and you indicated there's many areas that you have to go
back in and look at to address.

Being that we're closely approaching the first of September, my question would

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1 be, and we had an indication that we were going to be receiving some license termination plans
2 in or around the first of November, which is not much more than, say, eight or nine weeks away,
3 I would guess that if these issues aren't resolved, and they don't appear to be, that we can
4 anticipate there will be some delay in receiving those plans.

5
6 MR. FAUVER: I would hope that --

7 MR. ZINKE: The first of December is when it's coming.

8 MR. FAUVER: Yes. First, Maine Yankee --

9 MR. ZINKE: First of November.

10 MR. FAUVER: The first of November is when we're looking to submit this plan
11 and that's the goal. Now, what we want to do is to have as many technical meetings as is
12 required between now and then to get to the bottom of some of these issues. That's already
13 been in the works. We've got our meeting next week and we're going to go through some of
14 these issues then.

15
16 If there are still unresolved issues, we'll have one the week after that and we'll
17 have one the week after that until -- if there is a sticking point that you can't get over on a policy
18 basis, well, we're going to have to, I guess, know that.

19 It would be counter-productive to -- well, I'm not going to go there. But we hope
20 that we can resolve all the technical issues through these meetings.

21
22 MR. ZINKE: Just a clarification of language. I mean, a lot of times, we will say
23 we haven't decided, it's not ready, and that's because we have a lot of internal reviews. The
24 technical work may be done, but until we go through the reviews, we're not going to tell you until
25 we're pretty sure that that's what we're going to do.

MR. FAUVER: That's a fair -- thanks for bringing that up, George. We are well
on our way to having what we believe is a fully credible technical approach and I was being very
cautious in my statements that, well, we still haven't decided on how to do these things.

But these technical meetings are intended to go through those in detail, to

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1 ensure that we've addressed all your concerns in this submittal, so that we can get this thing into
2 the review process.

3 MR. CAMPER: Did we have one more comment? We'll take that and then we'll
4 take our break.

5 MR. SHERMAN: I wasn't sure I wanted to make the comment. I'm Bill
6 Sherman, I'm with the State of Vermont. I was trying to understand what your concept was. I
7 take it that in rubblizing the concrete, you're not going to scabbelize the surface, is that correct?
8

9 MR. FAUVER: That's incorrect. We will perform remediation on surfaces to the
10 extent required to meet the dose limits.

11 MR. SHERMAN: So you will reduce the amount of scabbelization that you have
12 to do, probably greatly.

13 MR. FAUVER: That's possible. That's not the purpose behind this. The
14 purpose is -- the goal of decommissioning is to demolish the buildings and go to greenfield.
15 That's our goal. Now we're just doing a dose assessment and we don't know how that's going to
16 come out, but that's the purpose of what we're doing.
17

18 MR. SHERMAN: As you know from my discussion with you at lunch, we are
19 very interested in the work that the agency is doing on entombment.
20

21 MR. FAUVER: Yes.

22 MR. SHERMAN: And it appears to us that the rubblized approach is really kind
23 of a buried entombment.

24 MR. FAUVER: I'd completely disagree. I see no correlation between those two.

25 MR. CAMPER: Well, on that, let's take a break. I'm showing about 3:12. So
let's go for 15 minutes.

[Recess.]

MR. CAMPER: I'm showing about 3:30, almost, and we have about a half an
hour total. During that timeframe, we want to bring to closure any thoughts or comments on the

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1 rubblization discussion and then any closing or other outstanding issues that anyone wants to
2 bring up, and still try to get us out of here at the appointed hour.

3 I do have one thing I want to put on the table as far as rubblization is concerned.
4 It gets back to something I mentioned, that we are currently preparing -- yes?

5 MR. ATHERTON: When you get a chance, we have a question or two.

6 MR. CAMPER: Good. Okay. Absolutely. We are currently preparing a
7 Commission paper on the issue of rubblization. I think I mentioned that our office director, Dr.
8 Papierello, feels that this is an issue where he wants to get the Commission's perspectives on it.
9 He wants to have the Commission be aware that this is an emerging issue, that it has -- appears
10 to have generic implications, and that we would think that a number of the reactor sites might
11 use this approach as they went through decommissioning.

12 I think that Dave's comments indicate that this is -- again, this is a fairly common
13 thing. It's actually destruction of buildings and that's very understandable.

14 So we have this Commission paper and we have a timeline of September. And
15 the issue that I'm going to point out is that it would be of great value to the staff if rather than
16 seeing rubblization in an individual LTP, if we could see something from the industry that would
17 -- perhaps a white paper, if you will -- that would describe for us the rubblization concept. I think
18 today, for example, we've heard a couple of new ideas in terms of what it meant as compared to
19 what we thought it might mean, and that's okay. That's what this kind of dialogue is about.

20 But what I would like very much to do, frankly, is to be able to have such an
21 issues paper, to be able to refer to it in the staff's Commission paper, and then perhaps even
22 include that issues paper as an attachment within the Commission paper.

23 I think that would go a long way in addressing certainly the issue, as I see it,
24 from a generic standpoint.

25 So I'm curious as to whether or not industry might be prepared to do that and if
so, what is the timeline and more specifically, would it match up with my current objective of

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1 September for a Commission paper.

2 Okay, Paul, what's the answer to that?

3 MR. GENOA: Yes. Larry, it seems appropriate for us to put our thoughts down
4 and provide that to you in a fashion that will be useful in your timeframe.
5

6 The only caveat I'd have is it's a new idea, we're exploring it. Perhaps we've
7 already made an error by hanging a label on it. It's not clear that it's one thing we're hanging a
8 label on.

9 But we will address that and we will provide you some input in the form of a
10 white paper of limited length, that will be hopefully useful in discussing this issue.
11

12 MR. CAMPER: Thank you. We appreciate that. Okay. We have some
13 comments from the audience.

14 MR. ZINKE: Just on this same subject. In order to meet your goals on
15 September, when would you need it?

16 MR. CAMPER: I would like to have it by September 15, if that's possible.

17 MR. ZINKE: Fine. Thank you.

18 MR. PITTIGLIO: Next week would be better.

19 MS. JOHNSRUD: Judith Johnsrud, with the Sierra Club, National Nuclear Waste Task Force.
20 May I assume, therefore, that you would be equally interested in receiving a comparable
21 statement from persons in the environmental community?
22

23 MR. CAMPER: By all means.

24 MS. JOHNSRUD: Thank you.

25 MR. CAMPER: Yes, ma'am. That's a very good point and I appreciate you
bringing that up. Thank you.

ADN Please don't misinterpret my interest in having the industry articulate what it
RIL means. The concept has been raised by industry and what we're trying very hard to do is to
EY understand what industry means by the term rubblization and what this concept is really all
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1 about.

2 By no means does that exclude or did I mean to imply that it excludes other
3 views about what that topic is, and we would welcome that type of information and we would
4 factor that into the Commission paper and we would put it as an attachment.

5 Other comments?

6 MR. DUVALL: Ken Duvall, DOE. This question on this rubblized concrete is
7 very interesting. However, it brings to mind some concerns about our general release of
8 buildings, the fact that we generally consider the occupancy scenario as the important scenario,
9 even though it may be the limiting scenario, even in this case, if any building would be
10 demolished at some point, whether it's done prior to the LTP or afterwards.

11 I think that this discussion indicates that there are other scenarios that we need
12 to at least consider when we're releasing buildings and otherwise we may open ourselves for
13 some weaknesses and challenges to our release criteria.

14 MR. CAMPER: Okay. Yes, sir.

15 MR. ATHERTON: My name, again, is Peter James Atherton. I serve as a
16 nuclear safety consultant. I've represented the interests of the public, mainly in and around
17 nuclear power plants, at public meetings and hearings in the past.

18 This is my first foray into this area and I have some general basic questions, I
19 guess. One is of a philosophical nature. That is, the concept of permitting the environment to
20 be contaminated with radiation, I believe, was the result of the benefit that the people would
21 receive as a result of electric power generation from the use of nuclear power.

22 What it appears to me rubblization is attempting to accomplish is to permit the
23 additional contamination beyond that which exists today of the environment, where the people
24 themselves do not get a benefit. Possibly the utilities would benefit by lower costs.

25 So from a philosophical perspective, I would ask perhaps NEI to comment on
that. And especially when you try to minimize the amount of radiation that goes into the

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1 environment and I can tell you, representing the interests of people in and around these nuclear
2 power plants, the complaints have been that they get zapped by cosmic radiation, they get
3 zapped by what's left of nuclear fallout, and for the most part, they're not interested in getting
4 zapped by anything else, especially if they get no benefit from it.

5
6 So how would the public benefit by permitting you to further contaminate the
7 environment by doing what you have proposed in the form of rubblization?

8 MR. GENOA: I guess you asked for a response from NEI, and I'll do my best.
9 First, it's important to understand -- and I appreciate your acknowledgement of the benefit
10 associated with nuclear power, and that benefit was to supply electricity.

11 Residual contamination in buildings, surfaces and the lands, there are residual
12 contaminations associated with that, and the decommissioning process put in place by a
13 regulator requires us to assure that we will not expose the members of the public to excess
14 levels of radiation through a detailed dose assessment process.

15
16 We're not inventing radiation to put in these facilities. It is already there. And if
17 the building is left standing, it will be on the building. If the building is rubblized, it will be put
18 underground and it will be less accessible to the public.

19
20 I think the benefit to the process is, as we alluded, we think that there will be --
21 one, that any of the residual activity will be less accessible; two, the dose modeling may be
22 simplified; three, there will be less transportation impacts and other radiological impacts to the
23 workers tearing it apart, as well as the public, as this material would be moved, if you're going to
24 move off-site; and, finally, we think there will be perhaps some cost savings and some schedule
25 savings, and I think that's probably a valid issue, as well.

And those cost savings are not just to the utilities. The decommissioning funds
that are made available are collected from ratepayers, you and I who use electricity. So if we
can save those funds, that's a good thing.

MR. ATHERTON: I'm trying to understand the picture you just provided. While

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1 the utility has control over these contaminated buildings, you minimize the amount of radioactive
2 contamination to the environment. When you rubblize and distribute and provide an ultimate
3 solution, that contamination is left alone, whatever it is. It's left to seep into the ground water, it's
4 left to be bounced around by a tsunami, it's left to be done with, as I understand it, by whatever
5 nature provides or whatever man will do in the future.

6
7 And the question I have is, should there not be a -- since we do have this
8 contamination, should there not be attention paid to attempting to minimize the potential for
9 contaminating the environment, however miniscule that contamination is, beyond that which
10 already exists.

11 The options would be something I suggest you might want to look into besides
12 rubblization. Rubblization, I assume, you all didn't talk about this in much detail, but I assume
13 that you're going to demolish the building there on-site and bury the building there on-site, as
14 opposed to carry off what you demolish someplace else and bury it someplace else where it is
15 less likely to contaminate an inhabited area.

16
17 I'm assuming that's what you meant by demolish and rubblization. Am I
18 assuming too much?

19 MR. GENOA: No, I think you've got it. Yes, the question is does it make more
20 sense to leave the residual contamination in place or to move it to another place, take it out of
21 your backyard and put it in someone's backyard or whatever, and I guess the studies seem to
22 indicate that there is risk associated -- there is transportation risk associated with moving any
23 material on the highway.

24 That translates into a real risk to real people, moving trucks of dirt around. So
25 for trivial amounts of residual contamination, it appears to make sense to leave it in place, and
that's been demonstrated at not only commercial facilities, but Federal facilities across the
country.

Today we have a dose-based rule that's been established to assure the

1 protection of the public health and safety, and we're going to try to make every effort and we
2 have to make every effort to ensure that we meet that dose-based rule.

3 In that rule, we're trying to be innovative, cost-effective, and accurately model
4 what we're doing, and we're just exploring an option. It's just that.

5
6 MR. FAUVER: I think it's important to recognize that we have mentioned one or
7 two times that there is another option that's commonly used in the nuclear industry for
8 decommissioning, which is to remediate a building and leave the building standing.
9 Don't demolish it, you leave it standing.

10 MR. GENOA: And that's probably cheaper.

11
12 MR. FAUVER: It could be. But there is residual contamination on those
13 buildings. So this idea of this rubblization or demolition being something patently new in that
14 sense is probably incorrect. That's just what has been -- it's what the nuclear industry has done
15 for years and years and it's just the risk-based rule that just has allowed additional flexibility,
16 while still fully maintaining an appropriate protection, public health and safety protection.

17 MR. ATHERTON: I guess that's the part I don't understand, because what
18 you're asking for, in essence, as I read it, is you have a contaminated building in which you have
19 contained, for all practical purposes, the contamination. What you're proposing is to
20 decontaminate it, to some extent, and then rubblize it and expose the population and the
21 environment to the resulting radiation, which didn't exist before.

22
23 So you're asking permission to further contaminate the environment beyond that
24 which exists today, as I understand what you've explained, in different words.

25 MR. FAUVER: You have a choice --

MR. ATHERTON: And the benefit to the public isn't obvious to me, as there was
the benefit of producing electricity to the public while the plant was operating, while being
permitted to contaminate the environment by some allowable radiation level.

Do you understand the point that I'm trying to make?

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1 MR. CAMPER: Actually, I do understand your point. I think what we're saying is
2 this or what the industry is saying is this. They produced electric power over a period of time at
3 a given plant. As the plant comes to the end of its life and it goes through the decommissioning
4 process, there is residual radioactivity that remains.

5
6 The question is what do you do with it. Do you take it away? Do you try to
7 rubblize it? Do you entomb it? Do you leave it standing? Any number of things. But it is a --
8 the residual radioactivity is a byproduct, if you will, no pun intended, is a byproduct of energy
9 production. Let's do a comparative analysis.

10 Let's talk about a coal-fired plant. When you close a coal-fired plant, it ceases to
11 produce electricity, but as you go through dismantlement of it, there are also problems, residual
12 problems. For example, chemical, chemical contamination and impacts upon the environment is
13 something that has to be considered.

14
15 Now, it's ceased to produce energy at some point in time, but a coal-fired utility
16 would argue that, okay, now we have this residual problem, but it is a byproduct of the energy
17 production that went on for X number of years. It's the same kind of thing.

18 In other words, the issues associated with it don't stop the minute that energy
19 production stops. There are some things that have to be brought to a satisfactory closure.

20
21 Now, to get at your concern in terms of whether it is or is not a satisfactory
22 closure, bear in mind that what we have attempted to do in our standard, in Part 20, is impose
23 what I think is a conservative, most of us would agree is a conservative standard of 25 millirem
24 per year to a critically exposed group of people.

25 That means -- what that really means is it's typically the resident farmer
scenario. Someone is going to come there, they're going to dig a well, they're going to grow
vegetables there and consume them and so forth.

So we have tried to factor in public protection by creating a standard, by
developing guidance and models that allow utilities or others to determine what that exposure is

1 actually going to be and are they, in fact, under rubblization or some other decommissioning
2 process, going to make sure they meet that certain standard designed to protect public health
3 and safety.

4 MR. ATHERTON: I understand what you're saying. Let me ask you to look at it
5 from this point of view. Before the plant finished operating and decided to go out of commercial
6 operation, was the public being exposed to that level of radiation which you're saying you now
7 would permit them to be exposed to, the 25 millirem per year, I assume, once the plant is
8 rubblized and the land is leveled, or is that additional level of radiation something that they would
9 not have to be exposed to if you didn't have this rubblization at that location?
10

11 MR. CAMPER: No, they weren't being exposed to that during the operating
12 scenario, but what you're looking at now is a very conservative approach, both in terms of the
13 amount of radiation exposure that can take place and under a very conservative scenario.

14 MR. ATHERTON: But some of my constituents, who are members of the public,
15 living in and around the nuclear power plant, are not interested in being exposed to any more
16 radiation than they have to be. That's why I pose the question philosophically.

17 MR. CAMPER: I understand.

18 MR. ATHERTON: Does NRC want to permit further contamination of the
19 environment? Essentially, that's what you're doing, radioactive-wise, for what essentially
20 amounts to no benefit to the public in that area.

21 Would that be contrary to the philosophy upon which these nuclear power plants
22 were permitted to operate in the first place? Have you looked at it from that point of view?
23

24 MR. JOHNSON: Well, I think we looked at it from a point that was described in
25 the generic environmental impact statement. And this is one of the differences I see in this
rubblization concept and an issue that I think needs to be discussed more, certainly within the
NRC, is, is this concept of rubblization significantly different than what we evaluated in the GEIS
for the license termination rule.

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1 I think the basis for the GEIS was we assumed that buildings would be cleaned
2 up to the building surface criteria, not to some other criteria that allowed basically dilution with
3 clean material.

4 I mean, no matter how Dave wants to talk about his dose analysis, I mean, it's
5 still basically -- to me, it seems almost a dilution question, and dilution questions are questions
6 that we've had over the last 25 years in waste management and the policies that we've had in
7 the past is we don't want excessive dilution in waste management practices. That's why we
8 have treatment of gaseous effluents, that's why we have treatment of liquid effluents in power
9 plants and other licensed facilities.

10 This is the policy question that I think needs to be related, but did we look at the
11 benefits of leaving residual contamination criteria in place for decommissioning? Yes. It was
12 part of the GEIS and the assumption was that -- or the decision was made by the Commission
13 that 25 millirem is an acceptable level.

14 Now, the question here, that I'm not sure I have the answer to, is if you use this
15 concept called rubblization, which basically would leave substantially more activity in place for
16 building surfaces than was normally thought to be the way people would decommission a facility,
17 is that suitable, and I think that's a good policy question that needs to be put forward to our
18 upper management and the Commission.

19 MR. CAMPER: Thank you, Tim. I defer to Tim, because he had been involved
20 in the decommissioning program at the time the LTR was put in place.

21 But to try to answer your question a little more generically. No, the Commission
22 doesn't endorse the idea that our approaches allow more radioactivity to be put into the
23 environment or that individuals get exposure that they would not have. No, it doesn't. But what
24 the Commission does recognize is that residual contamination is a reality. It is going to be there.

25 It becomes a question of how it's managed. It becomes a question of what do
we believe -- what does the Commission believe to be an acceptable level of exposure, given

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1 scientific standards that we work with; in particular, the linear non-threshold model, which is a
2 conservative model.

3 And then with those two things in mind, try to put in place a regulation or a regulatory approach
4 that is going to, on one hand, allow decommissioning to take place, because, again, it is a
5 reality, decommissioning will need to happen, yet, at the same time, hopefully in a way that will
6 indeed provide adequate protection to the public.

7 I mean, zero is an ideal goal and no one would disagree with you on that. Zero is an idea goal.

8 But that's not a realistic goal.

9 So the question is, what is a safe goal, what is a reasonable approach.

10 MR. ATHERTON: Why is not zero a realistic goal, if you don't look into the
11 possibility of achieving it?

12 MR. JOHNSON: Well, we do. The limit in the regulation is 25 millirem and
13 ALARA and if you can reasonably get down to zero, then that's what your goal should be.

14 MR. ATHERTON: Mr. Camper already admitted that the rubblization would add
15 at least 25 MR to the environment that we wouldn't otherwise have by going through this
16 process.

17 MR. JOHNSON: No, I haven't admitted that you add 25 millirem. I'm not sure
18 what the dose is that you --

19 MR. ATHERTON: Then it's something higher than would otherwise be achieved
20 by not permitting rubblization at that location.

21 MR. JOHNSON: Well, it depends on the scenarios that you use to evaluate it.
22 But this is the policy question that personally bothers me, is the fundamental principle that we've
23 used in waste management for years is excessive dilution is not the solution.

24 Now, is this excessive dilution? Well, that's a policy question that probably
25 everyone in here has a different opinion on, but that's the policy question that we're going to be
putting forward and discussing more with our upper management and Commission.

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1 I don't have the answer to that.

2 MR. CAMPER: Let me clarify. I didn't -- I don't think that's quite what I said and
3 if I did, I certainly didn't mean to. What I said was is that the standard allows for 25 millirem
4 dose per year to a particular person, that rubblization could contribute to that allowed standard,
5 as could other decommissioning activities.
6

7 But, again, the standard is designed to be very conservative in nature and to be
8 protective of public health and safety.

9 Somebody to our right here has a question.

10 MR. FULLER: It's actually a comment on this. I've been at a site where
11 rubblization has occurred in the past and I'm sure will in the future, and the process that was
12 followed there was first to clean up the buildings to an acceptable level, at which point they were
13 released, and then rubblized. That seems to me an appropriate approach.
14

15 Following sort of the spirit of what you're suggesting, as you were following sort
16 of the spirit of a dose-based analysis, basically, you could take anything on-site and if you buried
17 it deep enough and it wasn't going to be too soluble, you could leave it there, you could do that
18 with a piece of pipe, just as -- you know, in the same spirit as with concrete.
19

20 And, basically, my understanding of that is that's low level waste disposal. The
21 NRC has a whole program for that that allows burying stuff just in the ground. But that's
22 supposed to be done at a site for that and my understanding was that disposal was not allowed
23 on-site at this point.

24 I really think that what you're proposing is that and I know that people are going
25 to think that that's the case and you're going to run into a real hornets nest when it's proposed
and people get some idea of what it is.

People want to see things cleaned and then you can do with them as you wish.

MR. FAUVER: It's very important to recognize that, as Paul mentioned in his
presentation, and I think I tried to mention at least a couple times, that, in fact, it may turn out

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1 that the scenario of the material being brought back up is limiting. We are taking absolutely no
2 credit whatsoever for the material being in its original placement.

3 We are going to do an entire assessment of potential dose consequences of this
4 material just being laying on the surface. Assume that it's laying on the surface and we will then
5 perform a dose assessment as to what can credibly happen and conservatively happen to this
6 material that somehow it could deliver a dose.

7
8 So we're taking absolutely no credit for the material being in some kind of buried
9 condition.

10 MR. CAMPER: Go to the mic, sir, so we have the record of this.

11 MR. FULLER: But if you're using that, you're basically going through a
12 processing scenario and you've effectively diluted the material.

13 MR. FAUVER: And that's an incorrect -- maybe I wasn't clear enough and there
14 appears to continue to be some confusion about this dilution issue.

15 We are taking no credit whatsoever for dilution of material in our dose
16 assessment. We are doing a dose assessment with material in the configuration in which it
17 exists.

18 MR. JACKSON: I'm Todd Jackson, from NRC Region I. It may be that there are
19 elements of the model that are using the material as it exists, but this sounds to me like overall
20 dilution, when you look at it from the site perspective, and I agree that that's the philosophical
21 question.

22 But I think I've gotten distracted by looking at rubblization as a process and
23 having that be the subject. It seems to me like what you're really proposing is a different
24 pathway, different model, and whether that's acceptable or not is really the bottom line question.

25 And I think that there will be -- I mean, it's still 25 millirem a year. It's more
activity at the site to produce that 25 millirem a year is what it boils down to, through a different
pathway analysis.

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1 MR. FAUVER: Let me answer that. We don't know yet actually whether it will or
2 will not be, and that's a true statement, because we're actually doing our leaching studies and
3 we don't know how that thing is going to turn out.

4 What we do know is this. That the goal of the decommissioning project is to
5 demolish those buildings and if it were to turn out that leaving that concrete and demolishing that
6 building resulted in a lower limit, that's the goal of the project, and we would go lower, unless
7 some very strange thing occurred. That's the goal of the project.

8 MR. JACKSON: I understand, but you can't ignore either --

9 MR. FAUVER: We don't have a choice about what models to use. We don't
10 have a choice. We have to use the model that's appropriate for the configuration.

11 MR. JACKSON: Yes, but it's also obviously an objective to do it for minimum
12 cost, and therein is a major part of where public distrust, I guess, comes from, as far as why
13 something would be changed.

14 There is clearly public interest already, at least in the sites that I deal with, in the
15 EPA/NRC controversy, which is kind of splitting hairs, when you get right down to it.

16 And if there is the prospect for leaving more activity at a site, I think the public is
17 going to be interested and may not be very receptive to hearing that the dose is no more, but the
18 amount of activity is less.

19 Thanks.

20 MR. CAMPER: Thank you. Good point. Yes, ma'am?

21 MS. JOHNSRUD: Yes, if I may. Judith Johnsrud, again. There are three or
22 four points that I want to try to pull together and my questions/comments are directed to NRC
23 staff, not to the utilities.

24 First off, concomitant with this endeavor for on-site decommissioning, the NRC
25 has undertaken what EPA attempted and decided not to undertake, which was the setting of
standards for volumetric decontaminated radioactive materials, and their release, recycle and

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1 reuse in an unlimited variety, apparently, of consumer products or industrial uses.

2 Initially, that was to cover scrap metal, primarily, and the NRC previously, over
3 about 20 years now, has attempted at various times to increase the deregulation, as it were, of
4 scrap metal.
5

6 So now we have the NRC, as I read NUREG-1640 at least, intending to release
7 concrete, in addition to scrap metal, contaminated soils, and various other materials for reuse in
8 the commercial market. Am I correct about that?

9 That is, that's the -- concrete is one of the number of solid materials addressed
10 in 1640.

11 MR. JOHNSON: Yes, that's correct.

12 MS. JOHNSRUD: Yes. And the alternative that we are hearing today is
13 rubblization with an on-site disposal, as it were, at sites, many of which are located in -- at least
14 in flood plain. I am thinking, as a Pennsylvanian, of Three Mile Island or of Prairie Island or
15 some of the sites that are at or very near coasts.
16

17 MR. JOHNSON: I think that would be true for just about all power plants.
18 They're located on a source of water and --
19

20 MS. JOHNSRUD: Precisely.

21 MR. JOHNSON: And they're probably on a flood plain.

22 MS. JOHNSRUD: Yes, or at least flooding in that occasional unusually high
23 flood, yes.

24 I'm having trouble with this with respect to the so-called critical group and I
25 believe you referred -- I'm sorry, I don't have last names associated with your set of faces --
Larry, am I correct?

MR. CAMPER: Yes, ma'am.

MS. JOHNSRUD: You mentioned the 25 millirem to the critical group.

MR. CAMPER: Yes, ma'am.

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1 MS. JOHNSRUD: Has there been a change in the NRC's determination that
2 that's a 25 millirem dose to the average member of the critical group? Is that no longer --

3 MR. CAMPER: No, it is the average member of the critical group.

4 MS. JOHNSRUD: Exactly. So you really are not then assessing the maximum
5 dose to a member of the critical group.
6

7 MR. CAMPER: No. It is the average member of the critical group. Correct.

8 MS. JOHNSRUD: Right. So what we would be seeing then, potentially, would
9 be that the farmer living on the site, obtaining his water supply from the site, as well as his food
10 stuffs, who also would be utilizing equipment, at least potentially, from recycled contaminated,
11 slightly contaminated, very, very low dose, I am assuming you're going to set as a limit, but a
12 multitude of objects made from or consisting of materials that were slightly contaminated and
13 had been deregulated and recycled.
14

15 And, therefore, there would be a component of exposure that is not taken into
16 full account because of our inability to measure the exactly number or even an estimate of the
17 number of such objects that the individual would be exposed to, in addition to some fractional
18 dose, we should hope not the full 25 millirem, on-site.
19

20 Is that not correct?

21 MR. CAMPER: As a practical matter, that's correct.

22 MS. JOHNSRUD: So what appears to be happening here, at least in
23 conjunction, again, with the issues paper on release, is that the NRC is utilizing a justification for
24 the release and reuse or disposal in this manner on-site of solid materials with the justification
25 being that there are standards in place for exposures for individuals in the public realm from air
and water, so you were simply planning to add dose limits for solids.

I can see the rationale of the Commission in that direction.

MR. CAMPER: Well, we can't control all the other sources, obviously. We can't
control cosmic, for example, we can't control medical exposure.

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1 MS. JOHNSRUD: Right, that's right. That's right.

2 MR. CAMPER: There are going to be other sources. I think your point is that
3 someone could get the 25 millirem from this particular scenario, they might get some other minor
4 dose contribution from some released material, but they might also get exposure from medical
5 examinations, but also get exposure from cosmic.
6

7 MS. JOHNSRUD: Precisely.

8 MR. CAMPER: They're going to get some exposure from themselves. You're
9 right. We don't control --

10 MS. JOHNSRUD: And whoever enters that shouldn't have entered when
11 somebody can't hang onto materials, yes. All right.
12

13 So the point that I then finally want to come to has to do with the views
14 expressed at the very recent symposium conducted in Ottawa by the Canadians, the Swedes,
15 and the Australians, in which the comments were made that even the ICRP is moving away from
16 the concept that the protection of public health, with dose limits which are based upon standard
17 man, primarily, that that protection has proven not to be adequate for what is now understood to
18 be a necessity for the protection of other components of the bio system.
19

20 The phrase that was utilized at this conference in May, mid-May, was protection
21 of the environment for its own sake. And I regret to have to say that we were quite disappointed
22 that there appeared to be no one present at this international symposium from the Nuclear
23 Regulatory Commission and virtually no one, one person I believe from EPA, one only.

24 Now, what I heard at that conference was a far more progressive approach to
25 environmental protection and also to protection from low dose irradiation and the consequences
apart from or in addition to cancer and leukemia and genetic defects, which are the basis for our
protection.

Where at the end of the life of these reactors, we have an obligation to clean up
the sites and my concern, which I expressed to NRC, is that the approaches that I am seeing

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1 coming into being here are moving us in quite the opposite direction from the minimization of
2 exposures, not only to human beings, present and future, but also to other components of the
3 bio system.

4 That -- thank you for your patience -- is a comment which I hope you will take to
5 heart in your consideration of the entire process of decommissioning.

6 MR. CAMPER: Thank you, ma'am. Let me point out that, as I said this morning,
7 and I think your comments point out that it's a good time to reiterate, we are in a listening mode
8 and we appreciate all the comments we've heard today, including yours, eloquently stated.

9 The staff believes that this issue is of such an important nature that it was
10 appropriate to surface it to the Commission in a Commission paper and receive policy direction
11 from the Commission.

12 That process along the way will allow opportunities for further comments. I have
13 also pointed out that we would be happy to add in terms of the Commission paper your white
14 paper, if you will, and address it in the Commission paper and make it an attachment to the
15 paper.

16 So at this juncture, no decisions have been made, certainly not by the staff, and
17 clearly not by the Commission, and ultimately the staff will do what the Commission directs it to
18 do.

19 So we're in a search mode today and all the comments are greatly appreciated.
20 Some very interesting perspectives have been offered.

21 Okay. I think it's about 4:10. Does anyone else have a comment that you feel
22 an urgent need to make at this point? We do want to turn to our regions, who have been
23 patiently waiting all day, and we wanted to see, does anyone in the regions have any comments
24 they'd like to offer at this point? Any comments from any of the regions?

25 Okay. Hearing none, we're about ten minutes past our time to adjourn, but
that's okay. We've covered some good stuff and had some good comments.

1 We're going to reconvene tomorrow morning at 8:30, so we'll see you all then.

2 Thank you and have a good day.

3 [Whereupon, at 4:11 p.m., the meeting was recessed, to reconvene at 8:30
4 a.m., Thursday, August 19, 1999.]

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