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# NUCLEAR REGULATORY COMMISSION

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UNITED STATES NUCLEAR REGULATORY COMMISSION

(NRC)

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OFFICE OF FEDERAL AND STATE MATERIALS AND ENVIRONMENTAL MANAGEMENT PROGRAMS

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PUBLIC MEETING ON THE POTENTIAL CHANGES TO THE NUCLEAR REGULATORY COMMISSION'S RADIATION PROTECTION AND GUIDANCE

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WEDNESDAY
OCTOBER 27, 2010

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The public meeting convened, at 8:30 a.m., in the Kennedy Ballroom of the Crowne Plaza Hotel, 8777 Georgia Avenue, Silver Spring, Maryland, Dan Hodgkins, facilitator, presiding.

PANEL MEMBERS PRESENT:

RALPH ANDERSEN, Nuclear Energy Institute
MICHAEL BOYD, Environmental Protection Agency
KIMYATA MORGAN BUTLER, U.S. Nuclear Regulatory Commission
DONALD COOL, U.S. Nuclear Regulatory Commission
JEAN-CLAUDE DEHMEL, U.S. Nuclear Regulatory Commission
CAROLYN HILL, S.M. Stoller Corporation
LARRY HAYNES, Duke Energy
BRIAN LITTLETON, Environmental Protection Agency
ROGER PEDERSEN, U.S. Nuclear Regulatory Commission
EDWARD ROACH, U.S. Nuclear Regulatory Commission
WILLIAM SMITH, Southern Nuclear Company

FACILITATOR:

DAN HODGKINS, Consultant

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

2 8:36 a.m.

3 MR. HODGKINS: Good morning.

4 We'll have everybody migrate to their

5 seats this morning.

6 And for those on the webinar, it seems

7 like we'll probably have a few people coming in a

8 little bit later, as I understand it. There may be

9 some backup, and consequently, some time that it will

10 take in order to get everybody here in their place.

11 Let's just, because there are new

12 participants, I just want to go over the groundrules

13 for today, so that everybody knows what's going to

14 happen.

15 As far as on the webinar, we will not be

16 taking questions over the phone. There was too much

17 problem with that in day one or day two. So, if you

18 will please write your questions or comments, type

19 them in, and then we'll have them read in the meeting.

20 Okay?

21 For the participants that are at the

22 table, we will usually start off with you folks

23 discussing some of those issues. We'll then, after

24 that, put it out into the audience for any comment or

25 feedback from the audience, and then also use the

1 webinar comments for the final closure of whatever
2 issue that we will be using.
3 Each area we'll do some discussion. Upon
4 closure, we'll move to the next one.
5 I'm going to hand it over to Don to do an
6 introduction, and I think we're ready to begin.
7 Welcome.
8 DR. COOL: Okay. Good morning.
9 MR. HODGKINS: Good morning.
10 DR. COOL: Okay. There are at least a
11 couple of people who have had some of the coffee back
12 there, and that's a good thing. All right.
13 Today is day three or day one, depending
14 on how you want to look at it. Today has a very
15 different focus than the discussions that we had the
16 last two days, but they are connected in a number of
17 key respects. Because the discussions that we will
18 have today do still look at radiation protection
19 criteria that are in the NRC regulations. And in
20 fact, today we are going to explore one of those
21 places in the NRC regs that dates back to 1960. So,
22 we'll just set that stage.
23 The agenda items today, there are four
24 major discussion issues that we will go through. We
25 will come back to that after a little while, but I am

1 going to see if I can manage to have the computer
2 change the slide.
3 And you should have these in your
4 handouts, so that you can follow along, and we can
5 flip back and forth.
6 How we are going to do this today is I am
7 going to give you a brief overview and introduction of
8 some of the connection and background related to Part
9 50, Appendix I, and the overall staff activities.
10 Then, once we get into the details of each of the
11 issues and the options and the questions, I am going
12 to be handing this off to some of my colleagues that
13 are here from the NRC who deal with this on a day-to-
14 day basis, because if I tried to describe it to you, I
15 would mess it up.
16 Having said that, we are going to try to
17 go through some of the issues. 10 CFR Part 50,
18 Appendix I, and I suspect that everyone in the room
19 knows that this is the part of the regulation that
20 deals with the reactors, and specifically the planning
21 criteria that are associated with effluents and
22 keeping those as low as reasonably achievable. I
23 guess it's fair to say that it is outdated.
24 As I said, we go back to the methodology
25 from ICRP 2, where they talked about maximum

1 permissible concentrations, MPCs, in the body from
2 various radionuclides and dose to the whole body, and
3 some doses to organs. Those concepts were updated and
4 replaced by what the NRC called total effective dose
5 equivalent that came from the recommendations of ICRP
6 26 and 30 in 1977, which were subsequently updated yet
7 some more and called effective dose with some further
8 changes in the details of the calculation in 1990 with
9 ICRP Publication 60, and which have continued to the
10 most recent set of ICRP publication recommendations in
11 Publication 103.
12 We spent a lot of time talking about some
13 of those terminology changes over the last couple of
14 days, particularly on Monday morning as the first
15 topic. We will come back and revisit a little bit of
16 that this morning because one of the issues, perhaps
17 rather obviously, is the question of whether we should
18 take this regulation and realign it with the newer
19 concepts, dosimetry terms, and otherwise.
20 But, right now, we have an outdated system
21 that is a bit inconsistent with the current
22 recommendations. That doesn't mean that we don't have
23 adequate protection. We need to start at that
24 standpoint.
25 It may be a very old methodology. It may

be something that they are no longer teaching in any of the schools, but it results not in a lack of protection, but, rather, complications because you have to do calculations a couple of different ways. You have to apply two different methods. It gets to be rather difficult to explain. Nobody else is doing it that way.

I know I have heard people tell me several times -- I think it was the folks from AREVA who were coming over and they had done a whole set of calculations, and they came over and they had someone who did the analysis here who came up with vastly different numbers. And after they picked themselves up off the floor, they realized that it was because of the approach used in the calculations, not that something fundamentally had changed. So, there are a number of those sorts of things that have to play as part of that.

What it does also do is the fact that you have a very different way of doing the calculational methodology and the approaches pose some challenges with the new certifications and designs. People have been doing these calculations in a number of different places. There are a number of efforts globally, including the things that the NRC has been part of and

1 the MDAP, the Multidisciplinary Design Approval and
2 Evaluation Program, using resources in a variety of
3 countries looking at consistency in calculational
4 approaches and assumptions, and the sorts of things
5 that need to be looked at to ensure that there are
6 safe designs for the new facilities.
7 These sorts of things make it just a wee
8 bit complicated to talk the same language, to have the
9 same approach, and to explain it to anybody out there.
10 If I put myself in the mode of, well, I've got to
11 walk down out of my building, onto the plaza in front
12 of White Flint, and try to explain this to the folks
13 from CNN and CBS and ABC and Fox, and otherwise, this
14 would be a rather tough chore. I think we would all
15 agree with that.
16 So the question is, what can we do? What
17 are some of the issues that are associated with it?
18 As I said, we believe that it is working. There is
19 not something here which is fundamentally broke in the
20 sense that there needs to be an immediate change;
21 otherwise, there's no longer safety, there's no longer
22 issues; radioactive material gets out into the public
23 or otherwise. That's not what is happening here.
24 What we do want to look at is the question
25 of trying to, as I said on Monday, look at increasing

1 alignment with the various international
2 recommendations and the terminologies, and otherwise.
3 It is not that we want to change fundamental design
4 criteria. It is not that we are looking to
5 necessarily fundamentally alter in any way the design
6 objectives, the level of safety that needs to be
7 achieved, or otherwise, but to try to have those
8 representations moved in such a manner that there
9 continues to be adequate protection of public health
10 and safety; there continues to be the appropriate
11 emphasis and discussion on optimizing protection,
12 achieving exposures and releases that are as low as
13 reasonably achievable, and doing it in a way that for
14 us meets our fundamental goals of regulations, that it
15 is clear, that it is explainable; it's logical; it's
16 reproducible; everybody understands the kinds of
17 activities that are going on.
18 And so, with that background associated
19 with these, I'm going to now turn it over to some of
20 my colleagues to start walking through some of the
21 details of the issues.
22 Jean-Claude Dehmel?
23 MR. DEHMEL: Thank you, Don.
24 As a matter of preface, all the
25 information that is presented here is contained in

1 Section 4 of The Federal Register notice dated
2 September 27th.
3 Yes, Roger?
4 MR. PEDERSEN: Yes, I can't get the
5 microphone on, but how about if we go around the room
6 and introduce ourselves since this is a different
7 panel today?
8 MR. DEHMEL: Good point. We missed that.
9 So, Don, we know who Don is.
10 My name is Jean-Claude Dehmel. I'm with
11 the Office of New Reactors. I'm a health physicist.
12 MS. HILL: Hello. I'm Carolyn Hill. I'm
13 with the S.M. Stoller Corporation, and I don't know
14 how you want to classify me, maybe as an informed
15 member of the public. But we have actually been
16 looking in-depth at some of these issues for a
17 Japanese utility for the past couple of years. So,
18 that is our interest in participating today.
19 MR. BOYD: Mike Boyd. I've been here the
20 last two days. I'm a health physicist at EPA.
21 Thanks.
22 MR. HAYNES: Larry Haynes, Duke Energy.
23 I've also been here the last two days.
24 MR. LITTLETON: Brian Littleton with the
25 EPA's Radiation Protection Division. I've been here.

1 It will be our group that will be looking into
2 whether we want to revise a standard, 40 CFR Part 190,
3 which is our nuclear power operations radiation
4 protection standard.
5 MR. PEDERSEN: Roger Pedersen, NRC, Office
6 of Nuclear Reactor Regulation. I'm mostly concerned
7 about our Part 50 licensees, the operating licensees,
8 and those plants that are trying to get licensed, the
9 delayed licensing process under Part 50.
10 MR. SMITH: My name is William Smith. I'm
11 with Southern Nuclear Company, a health physicist.
12 Southern Nuclear Company has three operating plants,
13 and they are in the process of licensing a unit 3 and
14 4 to operate in 2016.
15 MR. ANDERSEN: Is that a firm date?
16 MR. SMITH: Yes.
17 MR. ANDERSEN: Ralph Andersen with the
18 Nuclear Energy Institute.
19 MR. HODGKINS: Thanks so much. That was a
20 good practice for speaking directly into the
21 microphone.
22 Just a test to see, the webinar
23 participants, did they hear that? They did not? It
24 was breaking up? Okay.
25 So, I tell you what, why don't you go

1 ahead, Jean-Claude, and then we will repeat that in
2 the round robin for the webinar after your comments.
3 MR. DEHMEL: All right. Thank you.
4 Yes, as a preface, again, I would like to
5 reiterate that this information is presented in
6 Section 4, starting on the sixth page of The Federal
7 Register notice, and there's more information
8 contained in the SECY paper 08-01-97. Enclosure 3 and
9 4 address the issues we are going to be talking about.
10 And the information presented today, as
11 well as enclosure 3 and 4 of the SECY paper, will form
12 the basis of a more extensive discussion that is going
13 to be contained in the next SECY paper.
14 So, with that, we are going to go over the
15 options with respect to revising the Appendix I design
16 objectives.
17 So, as any rulemaking process or any
18 consideration of changing or revising regulations,
19 there is always the no change, you know, the status
20 quo option, so to speak. So, one option is to leave
21 the regulation the way it is because one is kind of a
22 part of the rulemaking process.
23 But there's another element addressed to
24 that having to do with the way the Appendix I
25 requirements are identified in a regulation under

1 10 CFR 50.34a, which, in essence, says that the
2 Appendix I criteria, the numerical guides and the
3 design objectives and everything associated with that,
4 are not to be meant to be a safety standard.
5 So, if it's not meant to be a safety
6 standard, and we are trying to realign this with Part
7 20, the technical basis on the dosimetry concept, in
8 this case, ICRP 103, a case could be made that the two
9 are, in essence, a completely different regulatory
10 requirement.
11 The case could be made that, as long as
12 the Appendix I numerical guide objectives are met and
13 the ALARA provisions are met of Part 50, Appendix I,
14 then you have met the intent of the regulation. And
15 the fact that we are using ICRP 2 criteria on dose
16 calculation essentially is an artifact of the
17 regulation, sure, but basically it is a guide.
18 It is essentially establishing some sort
19 of guideline in determining whether or not additional
20 equipment has been installed for the purpose of
21 treating liquid and gaseous effluent releases and
22 making sure that all releases are ALARA and the doses
23 to the members of the public are ALARA and minimized
24 to the practical extent.
25 So, whatever our guideline is, it could

1 remain under the ICRP 2 criteria or it could be
2 upgraded to Part 20. So that is the first one.
3 The second one, 1b, the idea there would
4 be to align the dose definition and quantities of
5 Appendix I criteria with the ICRP recommendations,
6 given a revision of 10 CFR Part 20. So, here, the
7 objective would be to make that revision in Appendix
8 I, the numerical guides, consistent with the dosimetry
9 concept that would be adopted, incorporated in a
10 revised Part 20.
11 So we could, in this case, we would have
12 to wait and align this on essentially the basis of
13 what we are going to ultimately do with Part 20. So
14 you could see there could be an offset in time there,
15 so to speak. We could be doing some work upfront with
16 the realization that, whatever that alignment is with
17 Part 20, we are just going to have to adopt it,
18 essentially, the whole stock and barrel, and
19 incorporate that under the basis of the ICRP 2, I'm
20 sorry, Part 50, Appendix I, numerical guides.
21 Option 1c, recognize that perhaps the
22 Commission may say, no, Part 20 is fine the way it is,
23 and there's no need to revise Part 20 to ICRP 103, and
24 therefore, Part 20 would remain under ICRP 20, 6930,
25 dosimetry concepts. So, it would be, in essence, no

1 change to Part 20.

2 If that is the case, then we are still
3 hoping that we would essentially try to revise the
4 regulations under Part 50 of Appendix I and make it at
5 least aligned and make it consistent with the current
6 Part 20. So, the thought there would be to revise the
7 dose definition and the quantities of Appendix I
8 numerical guides and make them consistent at least
9 with the current Part 20, such that the calculation
10 dose methodology, the units, the quantities would be
11 synchronized and in agreement.

12 Now, with respect to the regulatory
13 implication of this, so you could see that for 1a
14 there may be essentially very little to do for the
15 staff with respect to the Reg Guides and dose
16 calculation methodology. The only thing is we still
17 have a few Reg Guides out there, a Division 1 Reg
18 Guide, that are still draft for comments. So, we
19 would perhaps take that opportunity to take those Reg
20 Guides and finalize them. So there would be very
21 little ramification on the regulatory guidance. The
22 computer codes would remain the way they are. The
23 main two NUREGs, NUREG-1301 and 1302, on the ODCM dose
24 calculation methodology, the surveillance requirement,
25 the action requirements, the applicability

1 requirements would all remain as they are.

2 In considering option 1b, that would

3 involve a major revision of the regulatory guidance,

4 the computer codes, and the NUREGs, obviously, because

5 everything would have to be normalized to ICRP 103

6 dosimetry concept, as revised and adopted in Part 20.

7 The same thing with option 1c, all the Reg

8 Guides would have to be updated and computer codes be

9 standardized to ICRP 20, 6930.

10 There was an advantage with going with 1b

11 because, as you will recall, the way Regulatory Guide

12 1.19 is set up right now, it actually allocates the

13 dose and considers doses for different age groups.

14 There is an infant, the child, the teenager, and the

15 adult.

16 So, if we go with ICRP 103, that

17 information and those conversion factors were already

18 provided in accordance with these different age

19 groups. There's maybe some finetuning that could be

20 done for the infant and the child, but that,

21 essentially, should be a fairly simple process. But

22 the point I am making is that the dose conversion

23 factors are there.

24 If we were not to revise ICRP 103, we

25 would have to go to ICRP 26 and 30, well, ICRP 26 and

30 do not address doses as a function of a different age group.

So, what we would have to do, like we did for ICRP 2 in developing a Reg Guide 1.109 dose conversion factor, we would have to repeat the work that was done in NUREG-0172, which took the ICRP 2 dose conversion factor and created a whole set of those conversion factors for the infant, the child, the teenager, and the adult. So, we would have to take that NUREG document and replicate it using ICRP 26 and 30 dosimetry consideration and dose factors.

So, those are the options.

MR. HODGKINS: Thanks so much, Jean-Claude.

Just, again, for the panelists, we have over on the side the folks that are managing the webinar, Kim and Willie, and then we have our transcriber James. And again, that is why we need to make sure that you are speaking directly into the microphone and being heard.

The other thing I just want to say is that we are going to do a round robin again to talk about reacting to the options. Just remember that behind you is 100 people that you are representing. Okay? So, absolutely, you've got your thoughts, but the

1 point here is that we have got an audience out there
2 in cyberspace that we want to make sure that we get
3 their point of view discussed. So, although you are
4 speaking from whatever background, also maybe speak
5 from your concerns that you have heard from your
6 background, so that we get a diverse set of ideas that
7 informs Jean-Claude, so that he can take it and review
8 that information to make the best decision.
9 This is not a decisionmaking panel. We
10 are not asking you to conclude. We are just asking
11 for you to discuss.
12 And since Ralph has been in the audience
13 and on the panel before, we will start there, so we
14 don't have to pick on you, Carolyn, to start a
15 conversation.
16 So, Ralph, if you would just react to and
17 give your opinions on those options, we would
18 appreciate it.
19 How are you doing? Technical
20 difficulties?
21 MR. ANDERSEN: We are live?
22 MR. HODGKINS: We are live.
23 MR. ANDERSEN: Good.
24 First of all, I would like you to consider
25 adding a fourth option for the purpose of evaluation,

1 not necessarily because I think it would be a real
2 popular option. I think the fourth option would be to
3 update 10 CFR 50. It would be option 1b independent
4 of 10 CFR Part 20.
5 So, I think you ought to add a 1d,
6 especially as you proceed and as you would address
7 this ultimately in a SECY paper to the Commission, to
8 disposition the issue of updating Part 50, Appendix I,
9 to ICRP 103, absent any change to Part 20. So, for
10 completeness more than anything else.
11 Other than that, I think the general
12 preference, as expressed from Monday as well, would be
13 option 1b. There's a lot built into that, obviously,
14 that would need to occur to arrive at that point. But
15 there continues to be the interest to be able to use a
16 current technical basis for what we do and, also, to
17 have consistency between the regulations. So that
18 would be the starting point as to why we would favor
19 option 1b.
20 Additionally, there is that issue of
21 international consistency as it plays out in
22 licensing. Now the flip side of that, though, is,
23 unlike Part 20, the implication of updating anything,
24 so either option 1b or 1c or 1d, if you add that
25 option, could be the impacts on the existing licensing

1 basis.

2 Looking through the questions, I think
3 that is implied, but not specifically called out, that
4 that would be a big issue to look at, is how you
5 handle things like facility modifications in the
6 future where they were originally licensed on one
7 basis and changes are being made under an implied new
8 licensing basis. I don't think anyone would want to
9 have to go back and rework their licensing basis.

10 I will comment that there might be some
11 lessons learned under General Design Criterion 19 in
12 which NRC has allowed, and even encouraged, the use of
13 updated factors for control room habitability
14 considerations. Then, also, I think it would be very
15 important to see what lessons learned could be derived
16 out of the rulemaking that was done some years back on
17 the Part 100 criteria in which, for new plants, the
18 25-rem whole body and the 300-rem-to-the-thyroid
19 criteria were converted to a 25-rem TEDE criteria for
20 licensing purposes. So, there might be some
21 significant lessons learned out of those two
22 activities.

23 MR. HODGKINS: Ralph, before you give over
24 your mic, will you just, again, your name and where
25 you're representing from?

1 MR. ANDERSEN: Thank you. I was pretty
2 good about that Monday. I forgot today. I apologize.
3 Ralph Andersen, Nuclear Energy Institute.
4 MR. HODGKINS: Thank you so much.
5 MR. SMITH: Okay. I'm William Smith with
6 Southern Nuclear Company, Nuclear Development.
7 To echo some of the things Ralph said,
8 since the current regulations provide adequate
9 protection, then any change that we have in the
10 Appendix I should be consistent with the changes that
11 we would have for 10 CFR 20 related to ICRP 103. But,
12 also, we should have the 40 CFR 190 change made
13 consistent with that, so that we are all in harmony
14 and talking on the same page.
15 MR. HODGKINS: Thank you.
16 MR. PEDERSEN: Roger Pedersen, NRC NRR.
17 Yes, I think my comments echo somewhat of
18 Ralph's, since we both are interested in operating
19 reactors.
20 NRR, obviously, is interested in
21 consistency of the design basis of our operating
22 reactors, and we have something called the backfit
23 rule that we have to be concerned about as well.
24 A general comment I have is in terms of
25 the overview here of which of these three, or possibly

1 four, options is the most desirable or the one that we
2 should aim for.
3 It is somewhat dependent on the identified
4 goal or benefit of making a change at all. I think we
5 need to get a full understanding of what all not just
6 the impacts of making a change, but what the benefits
7 would be.
8 I have heard Ralph, although I think he
9 has left the room now, in the past refer to the
10 problem that was mentioned earlier of ICRP 2 concepts
11 and dosimetry models aren't even taught anymore. So
12 there is an impact with the current operating plants
13 with the current status quo even. So there is some
14 benefit to that. Then, there are other benefits.
15 So, we need to collect that whole bag of
16 what are the benefits and the costs, and then go
17 through this process of trying to identify the most
18 desirable option, so we can put that in the SECY
19 paper.
20 MR. HODGKINS: Thank you.
21 MR. LITTLETON: Good morning. Brian
22 Littleton with the EPA.
23 I just want to, again, kind of say, well,
24 we would probably prefer option 1b, aligning 10 CFR 50
25 with the ICRP 103 recommendations, and a potential

1 revision to 10 CFR 20.

2 We are, the EPA, dealing with a very

3 similar issue when it comes to revising our standard

4 to 40 CFR Part 190. The dosimetry in that standard

5 has been outdated for a while. It was based upon ICRP

6 Report No. 2, dosimetry.

7 And we are very interested, although we

8 haven't made a final decision, but we are very

9 interested in updating that portion of our standard.

10 Some of the things that we are struggling with right

11 now are in considering whether we want to revise it or

12 not are, if we do revise it, what is our ability to

13 move towards, let's say, ICRP 103, dosimetry, in lieu

14 of the fact that there's still some minor details that

15 need to be worked out for us to get there.

16 This is mostly a timing issue. Realize

17 that the agency, we prefer to move to the most recent

18 scientific and technically-available methodology, but

19 there are some issues that do come up with moving to

20 that methodology.

21 But kind of in looking at that, we do

22 prefer to, I guess, kind of move towards option 1b,

23 which I believe we think is optimal for both NRC and

24 it would be optimal for us as well.

25 MR. HODGKINS: Thank you, Brian. You can

1 hold onto the mic.

2 So, this side has a mic you can share.

3 Larry, do you want to take it away?

4 MR. HAYNES: Larry Haynes, Duke Energy.

5 There is not a lot to add to what's

6 already been said. I think I would add, though, from

7 a practical standpoint, most utilities, particularly

8 ones with plans to build new plants, would prefer that

9 we totally align Part 20, Part 50, and ICRP 103, and

10 working with EPA, for that alignment as well.

11 It just makes sense that we bring up

12 ourselves to the current science that is available and

13 that we at least at some point start on the same foot

14 with training for new folks coming into the industry,

15 and as we turn over our current plants to new folks,

16 and the new plants to be built, that it just makes

17 sense that we would have that alignment. And now

18 would be the right time to try to make that approach,

19 if we are going to do it.

20 MR. HODGKINS: Thank you.

21 MR. BOYD: Mike Boyd, EPA.

22 I would like to start out by saying that,

23 in keeping with your groundrules, that Brian and I are

24 offering are opinions because, of course, this is also

25 a public process at EPA, and all these decisions are

1 yet to be made. But, given that, I agree that 1b, I
2 think, is the ideal.
3 I also would like to say that there is a
4 problem with the lawyers usually in terms of how to
5 write a regulation that can be somewhat a living
6 document that can reflect the latest science.
7 We, both NRC and EPA, have in various
8 regulations actually codified things like tissue-
9 weighting factors and radiation-weighting factors, and
10 then our hands are tied. DOE has done the same.
11 To the extent that we could treat it more
12 the way we regulate chemicals at EPA, where, as new
13 risk information comes in, the risk coefficients can
14 be updated through a very open, transparent process,
15 but keep abreast of the latest science, if we were
16 able to do that, in five or ten years, if the tissue-
17 weighting factors were to change -- and I'm also
18 cognizant of the burden this could put onto the
19 regulated community, but you shouldn't have to do a
20 rulemaking every time a tissue-weighting factor
21 changes. So that's my opinion.
22 MR. HODGKINS: Thank you.
23 MR. ROACH: Good morning. I am Ed Roach,
24 Branch Chief, Health Physics, New Reactors Office, and
25 I have been working with Jean-Claude on this to

1 support the potential rulemaking for Part 20 and Part
2 50.
3 MR. HODGKINS: Ed, can I just interrupt?
4 MR. ROACH: Sure.
5 MR. HODGKINS: Again, webinar folks, if
6 you can hold the mic right to your mouth, I would
7 appreciate it.
8 MR. ROACH: Okay.
9 MR. HODGKINS: Yes, there you go. Karaoke
10 time.
11 MR. ROACH: Anyway, my name is Ed Roach.
12 I'm the Health Physics Branch Chief for the New
13 Reactors Office. I have been working with Jean-Claude
14 Dehmel on preparing the policy statements as this
15 moves forward and supporting Don Cool in this
16 endeavor.
17 From the perspective of the New Reactors
18 Office, it would nice to step out on the right foot
19 with everything aligned. However, what we prepare are
20 options for the Commission to give them a chance to
21 evaluate practical cost and all the other
22 implications.
23 So, ICRP 103 is the best new science.
24 That leads us to 1b, if I had a personal preference.
25 MR. HODGKINS: Thanks, Ed.

1 Carolyn, do you think you've got the hang
2 of it?
3 MS. HILL: I think so.
4 MR. HODGKINS: All right. Go ahead.
5 MS. HILL: Carolyn Hill, S.M. Stoller
6 Corporation.
7 I think, in general, I would agree with
8 everything that has been said. From an outsider's
9 perspective, Appendix I is now with 103, I guess, four
10 iterations behind on the scientific basis. So,
11 definitely the argument has been made for the public,
12 but it would be beneficial to update.
13 Again, speaking from an outsider's
14 perspective, please correct me if I am making any
15 assumptions that are too broad or anything. But it
16 seems that it would be easier for the licensees to
17 update their regulations in one fell swoop to align
18 with the Part 20 changes and the Appendix I changes,
19 if both were aligned with 103. So, I think, again, 1b
20 would be the preference from our standpoint.
21 But, also, I had a question. I didn't
22 know if this has been discussed in the past few days,
23 the timeline for rolling out the Part 20 changes and
24 the Appendix I changes.
25 It also seems that maybe the Appendix I

1 changes wouldn't be as great of an impact on the
2 licensee as the Part 20 changes, and that the NRC,
3 with the associated Regulatory Guides with Part 50,
4 might have more of a larger effort there. I don't
5 know, but maybe to go along with Ralph's fourth
6 option, if it is possible to roll out the Appendix I
7 changes first, and then have licensees follow with the
8 Part 20 changes, because it seems like that would be a
9 greater impact to that.
10 MR. HODGKINS: Okay. Thanks so much.
11 Jean-Claude, do you want to add anything
12 to that?
13 MR. DEHMEL: Yes, I want to add one more
14 item. I go back to the first option 1a with respect
15 to I would like to revisit this and talk about the
16 fact that, again, the purpose of revising Part 20 has
17 to do with, first and foremost, the fact that it deals
18 with doses, and it is a safety standard, doses to
19 workers and doses to members of the public.
20 Again, you kind of explore the issue of
21 the fact that Part 50, Appendix I, is clearly
22 identified in 50.34a, that is not a safety standard.
23 Now, given that reinforcement or reiteration, does
24 that change any of the viewpoints here?
25 MR. HODGKINS: How about let's just go

1 around and get a yes or a no.

2 Ralph?

3 MR. ANDERSEN: No.

4 MR. HODGKINS: No. Ralph says no.

5 William?

6 Oh, wait a second.

7 Can you repeat the question, Jean-Claude?

8 MR. DEHMEL: Yes. I just want to go

9 revisit option 1a with respect to that, in recognizing

10 that 50.34a specifically states that the Appendix I

11 numerical criteria and compliance with ALARA portion

12 or elements or provisions of Part 50, Appendix I, are,

13 in essence, not a safety standard. Now, given that

14 and in light of what you just heard again, do you

15 still essentially maintain that we should revise Part

16 50, Appendix I, to ICRP 103 under option 1b?

17 MR. SMITH: In that case, I would say no.

18 Why are we changing it?

19 MR. PEDERSEN: I think it goes back to my

20 question of, what are the benefits and what's our

21 stated goal here? I agree with you, Jean-Claude, we

22 don't have a safety issue here in the way we are

23 currently regulating plants and using the current

24 version of Appendix I. So there's no safety reason,

25 particularly since, as you point out, this is not a

1 safety standard; it is a design criteria.

2 But I'm not sure that is the major benefit

3 that might be gained by making a change. So I don't

4 think that is the only issue that we are going to be

5 talking about today.

6 MR. HODGKINS: Brian?

7 MR. LITTLETON: This is Brian Littleton,

8 EPA.

9 I guess I would question, I guess, whether

10 it doesn't have portions of a safety standard. Now

11 the changes may not be changes related to or that are

12 driven by safety, but I think that Appendix I does

13 have portions that talk about, I guess, dose to both

14 the worker and individuals, public individuals, that

15 it is kind of interwoven in there. So that's my

16 question.

17 MR. DEHMEL: Well, to answer your

18 question, it is that the doses, or the numerical

19 criteria are, in essence, kind of a guide, and it is

20 introduced in Part 50 of Appendix I; it is a guide. A

21 decision was made back in 1975 that the doses

22 associated with effluent releases from nuclear power

23 plants should be a small fraction of background. So,

24 basically, based on that, the decisions that were made

25 then for liquid effluents is 3 millirem to the whole

1 body; for gaseous effluent, it is 5 millirem to the
2 whole body.
3 So, if you look at that, you talk about
4 exposure, doses are a small fraction of background.
5 The industry has essentially been able to meet the
6 Appendix I numerical guides without any problem. And
7 the fact that we are referencing, we are using this
8 bright line, we are expressing doses as a measure of
9 compliance with the numerical guides, as well as for
10 the purpose of demonstrating compliance with the ALARA
11 requirement, provisional Section 2d, we could use any
12 other standard. We could be using release rate,
13 right, total curies per year, curies per second, and
14 so on. So we could be using another measure.
15 Now some within the staff, as well as
16 within the industry, might say, well, ALARA, if you
17 look at the provisions identified in Part 20, this
18 applies to all applicants and all licensing. Section
19 1101b has, essentially, a provision in it that says
20 all operation, all effluent releases should be
21 essentially ALARA.
22 So, there is an implication that, if you
23 are to reach out in Part 20, that section says, well,
24 the ALARA implication of Part 20 implies safety, even
25 though the ALARA implication in Part 50, Appendix I,

1 is truly a numerical guide to determine whether or not
2 have effluent releases been treated such that you can
3 meet the numerical criteria of Part 50, Appendix I.
4 While the ALARA criteria in Part 20 tend
5 to focus on reducing releases for the purpose of
6 minimizing doses, and that could be interpreted, well,
7 that is really safety; the intent there is really
8 safety.
9 So that is what I am trying to tease out
10 from all the panel members to see whether or not, if
11 you think about this and go to these different
12 requirements, go back to what happened in 1975, when
13 Appendix I was issued, can we release -- it is,
14 indeed, a non-safety standard. The guides are, in
15 essence, artificial. In 1975, we said it should be a
16 small fraction of background and essentially retained
17 that approach, and then just change the methodology or
18 leave it the way it is because it has no connection to
19 safety.
20 MR. HODGKINS: Did you want to react to
21 that, Brian?
22 MR. LITTLETON: Yes. Just, I guess, I'm
23 providing you some input that we have received from
24 our public stakeholders, our environmental groups that
25 we have spoken with, regarding any changes that we may

1 have for our standard. I think the same kind of
2 impression might apply here as well, although I'm not
3 pushing it.
4 The input that we have gotten from our
5 environmental groups is, once you have a standard on
6 the books, they look at anything, any changes, as,
7 okay, have we stepped back and is it less protective?
8 And so, it might be there may be some that don't
9 understand that there are aspects of this Appendix I
10 that are not safety-related and they would take a look
11 at it and say, well, you know, the NRC made a
12 determination at some point that this was the safest
13 standard that could be adopted. Any back-step from
14 that might be, I guess, a less stringent standard.
15 So you might want to consider that
16 viewpoint as you go down this. It is not anything
17 that the agency is necessarily pushing. So, this is
18 not, I guess, a comment from the EPA, more so just as
19 a cautionary note based upon what we hear from the
20 public on some of our standards.
21 MR. DEHMEL: Thank you.
22 MR. HODGKINS: Hold on a minute. I'm
23 going to steal one of these mics.
24 Ralph, you wanted to add, I think?
25 MR. ANDERSEN: Ralph Andersen, Nuclear

1 Energy Institute.

2 I guess I will elaborate on my first round

3 here. What comes to mind is, if it walks like a duck,

4 quacks like a duck, and acts like a duck, that might

5 apply here.

6 In the revision to Part 20 in 1990, the

7 NRC rationalized assurance of meeting the 40 CFR 190

8 criteria of EPA's standard, which is, in fact, a

9 requirement in Part 20, so that raises an interesting

10 question about whether that is a safety standard or

11 not. The rationalization was that the Appendix I

12 criteria assure that the 40 CFR 190 standard will be

13 met. So, in effect, NRC updated and revised its basis

14 for the Appendix I criteria in a rulemaking. So that

15 needs to be taken into account.

16 I would still argue that Appendix I is not

17 a safety standard, but I would just say the lines got

18 blurred considerably with the way in which NRC updated

19 Part 20 previously and rationalized the requirement

20 specifically for meeting the 40 CFR 190 criteria.

21 Since then, also, we have pulled the

22 Appendix I criteria into the regulatory oversight

23 program, where it is now a performance indicator in

24 the ROP, which can create regulatory response, if one

25 exceeds that. And we have brought the essence of it

1 into the space of NRC enforcement.

2 So I just want to comment that,

3 notwithstanding the original basis for the Appendix I

4 criteria, their use in regulation has changed over the

5 years and simply blurred the line. I still agree with

6 your point, Jean-Claude, but I think that has become

7 blurred.

8 And then, finally, I would just make the

9 same point that Brian made. Our own experience with

10 our public over and over and over again is they view

11 the Appendix criteria as limits that we are committed

12 to meet. But that's just the way they understand

13 them, not as guidelines. Even though, technically

14 speaking, if we exceed one of those, we are simply in

15 a corrective action venue and a reporting venue, they,

16 nevertheless, have communicated repeatedly the

17 expectation that we will, in fact, meet those

18 criteria, not just try to meet them.

19 MR. HODGKINS: Jean-Claude, we are going

20 around the room and ended at Brian with your initial

21 question. And as this is above my head, are we at the

22 point where we still need to go around with Larry and

23 get his reaction from your original question?

24 And, Larry, do you need him to repeat it?

25 Okay.

1 MR. HAYNES: Is it on now?

2 MR. HODGKINS: It's on.

3 MR. HAYNES: I think I remember the
4 question, and I do agree, and I have a copy of The
5 Federal Register from 1991, when that very thing was
6 noted that, in the decisionmaking to change Part 20
7 last time, that Appendix I did not need to be changed.
8 There was no need to do that.

9 And fundamentally, what really started the
10 whole conversation is alignment with international
11 standards, and even more so, in my opinion, we have
12 talked about the last couple of days alignment within
13 the United States that aligns with the international
14 standards.

15 So, from that perspective, that is why, in
16 my opinion, we need to go forward with the fundamental
17 changes across the board.

18 And Ralph's option 1d would be to, if we
19 don't change Part 20, go ahead with a change in the
20 Appendix I.

21 So that is the big elephant to chew on.
22 Any of this is going to be expensive and a lot of work
23 for the utilities to comply with. But I think from
24 the fundamental trying to align across the board, we
25 would be willing to try to bite that off and go full-

1 bore with it. But piecemeal, particularly if EPA is
2 not going to go along with that, we really aren't
3 going to get what we need and where we want to be at
4 the end of the day.
5 MR. BOYD: Mike Boyd, EPA.
6 And thanks, Larry. I hope you are going
7 to be one of those stakeholders supporting us when we
8 try to do that move forward to change our regulations.
9 I think this is not a question of a
10 changing standard as much as just translating it. I
11 think the ALARA guidelines seem to have worked well.
12 The offsite doses seem to be quite low. From my point
13 of view, it is just getting rid of having to train
14 workers and managers how to use ICRP 2. Whatever the
15 number is in ICRP 2, what would be the equivalent
16 effective dose, and go with that. Don't change
17 anything about the design basis at all. Just change
18 the way you calculate the number.
19 MR. HODGKINS: Thank you, Michael.
20 Ed, let's give you a microphone. I'll
21 pass it.
22 MR. ROACH: This is Ed Roach again, Health
23 Physics Branch, New Reactors.
24 Recognizing, as several people have, that
25 it is not a true safety standard, it has become a de

1 facto standard for implementation. I believe that, if
2 it were to stay the same, but the underpinnings were
3 to comply with ICRP 103, it would probably align us
4 well with the international community, which we are
5 somewhat skewed at this point. So I don't see that as
6 a major failing for us or an issue at this time.
7 MR. HODGKINS: Thank you, Ed.
8 Carolyn?
9 MS. HILL: I have nothing to add.
10 MR. HODGKINS: Are you going to pass?
11 Okay. As far as, then, Jean-Claude, do
12 you want to react to that reaction? Is that the
13 information you needed?
14 MR. DEHMEL: Yes. I just wanted to get
15 some additional feedback from the panel members. We
16 can go through the question section now.
17 MR. HODGKINS: Okay. And how about, is
18 this a time that you want to go to the audience, Don?
19 DR. COOL: Thank you.
20 Don Cool, NRC.
21 I think there's a couple of things for the
22 NRC staff's record that we used to develop a
23 regulatory basis in our recommendations for the
24 Commission that we need to check on.
25 And the question that I would like to toss

1 out, as people were discussing a few minutes ago, how
2 Appendix I is now actually functioning,
3 notwithstanding its original role as design
4 objectives, not a safety standard. There was some
5 discussion about how the NRC had put in 40 CFR 190,
6 and there had to be compliance with that requirement.
7 And in fact, there is the more generalized statement
8 that nothing within that rule, 10 CFR Part 20,
9 relieves a licensee from any other legal obligations
10 of other regulations, the EPA 40 CFR 190 being only
11 one of them that also happens to be called out.
12 I actually wanted to get a little bit of
13 reaction from our two EPA colleagues because the other
14 thing that keeps circling in the back of my mind from
15 the history back 10 years or so ago was that Part 50,
16 Appendix I, was a critical piece in EPA's ability to
17 say that there did not need to be any other regulatory
18 requirements on the reactor side of the house under
19 the Clean Air Act and effluents, which is one of the
20 components that Part 50, Appendix I, deals with.
21 And whether, as a basis for what we are
22 looking at, we also need to consider the relationship
23 of other EPA regulatory requirements beyond 40 CFR
24 190, and the relationship between those two in making
25 sure that we continue to have an alignment and we

1 don't, unintended consequence, get into a position
2 where we no longer have a basis, a firm legal basis,
3 to avoid duplicative regulation under some one of the
4 acts which EPA must administer, which is not an act
5 which gives the NRC any legal authority.
6 So I would be interested to see if Brian
7 and Mike want to help my memory and help our record
8 develop how that plays into this, and the extent to
9 which updating the underlying basis would be impacted,
10 if there would be an unintended consequences.
11 Thank you.
12 MR. BOYD: I think you're talking about,
13 when EPA, I guess we rescinded Subpart I or deferred
14 enforcement to NRC. I think that the limit under the
15 Clean Act for gaseous effluents was 10 millirem per
16 year, and NRC demonstrated that, even though that was
17 quite a bit below your facility limit, that none of
18 your licensees or power reactor licensees were coming
19 close to meeting that. And I believe there is just a
20 Memorandum of Understanding or something, something
21 along those lines, where we consult, if that ever were
22 to become a problem.
23 But, so far as I'm aware, changing
24 Appendix I criteria just to make it in terms of 103
25 dosimetry shouldn't have any effect on those decisions

1 related to the Clean Air Act.

2 MR. HODGKINS: Okay. Michael? I mean,

3 Brian?

4 MR. LITTLETON: Yes, this issue came up

5 with we have a requirement, 40 CFR Part 61, Subpart I,

6 which is our national emissions standard for hazardous

7 air pollutants for radionuclides, that this issue came

8 up.

9 I think my memory is not that good of it.

10 I'm relatively young.

11 (Laughter.)

12 But, if what I remember when I was younger

13 still applies, the issue was whether, I guess, the

14 agency should continue to enforce this requirement on

15 the books, this Subpart I requirement of 10 millirem

16 per year from hazardous air emissions, the

17 radionuclide emissions, or whether we could, I guess,

18 defer to the Nuclear Regulatory Commission because

19 their requirements were as stringent as the agency's

20 requirement.

21 And I think the analysis that was done,

22 and although I don't know this, did look at this 10

23 CFR Part 50, Subpart I, the criteria here, and then,

24 based upon an analysis of this, of the requirements

25 here, the agency was able to say that, yes, the

1 requirements that the NRC has are at least as
2 stringent as EPA's NESHAP requirement; therefore, we
3 can allow the NRC to enforce their requirements, and
4 our standard will be met.
5 So that's kind of a quick, and I don't
6 have a lot of details about that, but my quick memory
7 of the issue.
8 I guess I would say that, regarding that,
9 I think that maybe part of if a revision is done to 10
10 CFR 50, it could easily be codified during the process
11 that, yes, any revisions that are made to 10 CFR 50,
12 that they do still meet the original intent of EPA's
13 40 CFR 61, Subpart I, requirements.
14 So, I think it can be done. I don't want
15 to dismiss it, but it is something that can be
16 handled.
17 MR. HODGKINS: Ralph?
18 MR. ANDERSEN: Ralph Andersen, Nuclear
19 Energy Institute.
20 Given that that was about 16 years ago, my
21 memory is a little bit hazy, too. I have lost more
22 brain cells than Brian has since then.
23 (Laughter.)
24 But I was the industry lead, and it was
25 through a rulemaking, by the way. It wasn't a

1 Memorandum of Understanding. It actually was a formal
2 rulemaking by EPA.
3 And the basis for the deferral to the NRC
4 was, in fact, the Appendix I criteria explicitly. And
5 one artifact of that, interestingly enough, thinking
6 about yesterday's conversations, that was precisely
7 what caused the NRC to have to promulgate a constraint
8 for other licensees of 10 millirem per year. Because
9 the EPA was satisfied, once they had thoroughly
10 reviewed how NRC applies Appendix I to its reactor
11 licensees, and became completely satisfied for that;
12 they still had great reservations about the remainder
13 of NRC-licensed facilities.
14 So, it was for that reason only that NRC
15 promulgated the 10-millirem-per-year dose constraint
16 in Part 20 for other licensees. That allowed EPA,
17 then, to defer all NRC licensees to the NRC under
18 NESHAP.
19 So, indeed, Don, the point you raise, if
20 such a rulemaking was undertaken, to me, it would be
21 unavoidable that NRC would need to consult with EPA to
22 consider whether EPA may need to actually take an
23 action concurrently to renew the deferral.
24 Legally, this is lawyers' space on EPA and
25 the NRC side, and who knows how lawyers might view it?

1 But there is a legal connection between Appendix I
2 and Subpart 61 for that reason, because it was done
3 through a rulemaking.
4 MR. HODGKINS: Thank you, Ralph.
5 Do we want to open it up to the audience
6 at this point? Or do you want further discussion,
7 Don, Jean-Claude? Shall we open it up to the audience
8 just to react?
9 DR. COOL: Sure.
10 MR. HODGKINS: Let's do that, as far as,
11 are there any comments from the audience? I see
12 microphone 2 first, and then microphone 1.
13 And this is the time for our webinar
14 participants to type in their questions. Right now,
15 there are none.
16 MR. MECK: Thank you.
17 My name is Robert Meck, and I'm
18 representing Science and Technology Systems.
19 It was mentioned early that AREVA had made
20 some calculations and there were apparent
21 discrepancies. Can the NRC staff give us the source
22 of that, so that we could take a look at those
23 calculations? Is this public information?
24 MR. DEHMEL: Jean-Claude Dehmel, NRC.
25 No, we do not have that information. That

1 information was obtained during what was called a
2 quality assurance audit of the submittal, the FSAR
3 submittal, before it was formally submitted to the
4 NRC. And we had discussion with their staff at that
5 particular time.
6 So, in the context of our review of the
7 pre-submittal of the FSAR, we had looked at some of
8 the results for Appendix I calculations and compliance
9 with Appendix I requirements for both liquid and
10 gaseous effluents.
11 In the course of the discussion, we were
12 told that the American team had taken the European
13 design and essentially scrubbed it through the Part 50
14 licensing process, and in doing so, they came up with
15 doses, obviously, using the NRC guidance, the
16 Regulatory Guides, the SRP, and the computer codes.
17 As part of an internal check within AREVA,
18 they essentially sent information back to their French
19 health physicists, who looked at it, and they were
20 somewhat dumbfounded that the results would be so
21 high. And the French team thought that there had been
22 a dramatic error made somewhere on the part of the
23 American team.
24 So, the American team was able to fully
25 explain to their French counterpart that the process

1 in Appendix I, the use of the guidance, the Reg Guide,
2 the SRP, is such that it instills a certain degree of
3 conservatism that essentially is not applied in
4 Europe; plus, we are still, again, using ICRP 2 dose
5 conversion factors. So, taking these two factors into
6 play resulted in apparent doses, still in compliance
7 with Part 50, Appendix I, and Part 20 on concentration
8 limits, given that, and results that are comparably
9 higher than the similar calculations done in Europe
10 for the licensing of those plants in European
11 countries.
12 MR. MECK: Would any of this specific
13 information be in ADAMS documents?
14 MR. DEHMEL: No, this information is not.
15 It's not in ADAMS. It was not submitted to us.
16 We did ask for some specifics because, at
17 that time, we had already written SECY-08-01-97, and
18 we thought that would be useful information for us to
19 actually show a difference between an identical design
20 licensing there versus the same plant licensed in the
21 United States, to show the delta, the differences, and
22 relate that to this global licensing of a nuclear
23 power plant, but we were not given that information.
24 MR. MECK: All right, I have a followup.
25 There are significant intangible benefits for updating

1 this. It was questioned, what are the benefits?
2 Things that come to mind is the status of national and
3 technological and scientific position of the United
4 States in the world. It has been clear in the media
5 and other tests that the United States is not as
6 expert as it used to be. And it is my professional
7 opinion that this Appendix I situation could be a
8 poster example of some of those things, of how we have
9 fallen back.
10 And in addition, in terms of public
11 confidence, that is another intangible benefit that
12 could be improved with the improvements. And thirdly,
13 the alignment with international scientific practice
14 and technical practice.
15 These are significant intangible benefits
16 that I urge the staff to emphasize in their
17 communication with the Commission, when you write your
18 paper.
19 MR. HODGKINS: Is there another followup?
20 MR. MECK: Yes. I would like to make a
21 point that, throughout these three days, there have
22 been assertions that there was adequate protection.
23 But to a scientific and technical person, assertions
24 don't get you very far, and I have yet to see it
25 demonstrated on a radionuclide-by-radionuclide basis

1 that these assertions can be supported with technical
2 facts. And I urge the Commission to demonstrate this.
3 And that's why I was asking for the data in the first
4 place.
5 Thank you very much.
6 MR. HODGKINS: Thank you.
7 Microphone 1?
8 MR. DAVIDSON: Hi. It is Scott Davidson
9 with New World Environmental.
10 My comments were going to be very similar
11 to Dr. Meck. Having written them down, I can read.
12 Do we know or strongly believe that, if
13 Appendix I and 40 CFR 190, et cetera, were all
14 harmonized with the ICRP guidance, and we do the math
15 correctly, will it cause reactor effluents to go down
16 for the current plants? And if that answer is no,
17 then this is an exercise, intangible exercise, or
18 exercise to promote math and science, and will not
19 cause reactor effluents to go down.
20 So, what would be the justification? If
21 we haven't done that exercise, a sensitivity analysis
22 or something, then I don't know how we proceed on
23 this. Do we know that reactor effluents have to go
24 down to meet the new standards?
25 MR. HODGKINS: Okay. Thank you.

1 As far as panelists, any reaction from any
2 of the information that you just got?
3 And then, you were wanting microphone 2?
4 Okay, let's go for the panelists first.
5 MR. ANDERSEN: Ralph Andersen, Nuclear
6 Energy Institute.
7 In response to the last point, the fact is
8 that we operate at small fractions of the Appendix I
9 criteria. There's a very large margin. That is true,
10 really, with any limit that we deal with. We don't
11 operate at limits. That is the first thing.
12 The second thing is that it is unlikely,
13 although, as you say, you could do the math, but it is
14 unlikely, then, any conceivable change to the
15 standards would actually change nuclear power plant
16 operations. In many cases, we are at less than 1
17 percent of the criteria. So there's several orders of
18 magnitude margin.
19 Secondly, the issue of public confidence,
20 I just wanted to mention that an issue that was raised
21 with the NRC in the late nineties is the transition
22 between the Appendix I criteria and the protective
23 action guidelines. The protective action guidelines
24 are cast in, at least at that time were cast, in ICRP
25 26 and 30 space, and you actually had an interesting

1 transition.

2 Typically, you declare a site area

3 emergency when you exceed the tech spec value,

4 technical specification values, by a factor of 10. In

5 fact, those technical specification values are the

6 Appendix I criteria.

7 Then, you are required at that point to

8 consider onsite actions and to consider whether you

9 maybe should take precautionary public protective

10 actions. And the very first thing that you have to

11 do, then, is do a dose estimate of public dose from

12 the emerging events at the plant. And the dose

13 estimate that got you into that condition was done

14 under ICRP 2. And when you repeat that same

15 calculation using ICRP 26 and 30 with the particular

16 nuclides we deal with at nuclear power plants,

17 suddenly, you find that you haven't met that

18 condition.

19 So, you call everybody back and say,

20 "Oops, no, I'm not there." And then, when you fall

21 back to the previous level, then you recalculate using

22 ICRP 2, and you'll say, "Nope, I am in that

23 condition." And basically it's a DO loop that puts

24 you back and forth, and we saw that as a significant

25 public confidence issue at the time.

1 NRC opted not to take action, even though
2 we spent a lot of time discussing this. They
3 recognized that artifact. So no specific action was
4 taken. But that would be another example of a benefit
5 to resolving a common methodology.
6 Help me out, EPA, but I think the
7 emergency preparedness stuff now is actually cast in
8 ICRP 60 space, but I am not totally sure about that.
9 MR. BOYD: Of course, we haven't issued
10 the new PAGs. The draft that has been circulated is
11 in ICRP 60.
12 MR. HODGKINS: Thank you.
13 Roger, did you want to add to the
14 conversation?
15 MR. PEDERSEN: Yes, I didn't want to
16 disrupt this thread that was going on, which was very
17 interesting.
18 Yes, something that came to mind when
19 Jean-Claude first pointed out that Appendix I is not,
20 and is clearly stated is not a safety standard, we
21 need to keep in mind that Appendix I actually is
22 multifaceted, not just in its implications on how we
23 interact with EPA, but within our own NRC purview.
24 And that's reflected in the title of
25 Appendix I, actually. It is design criteria for the

1 review of new plants, new radwaste system designs for
2 new reactors that are being licensed. And then, those
3 same criteria are applied as limiting conditions of
4 operation for the operating plants.
5 So, as we go through this, we need to keep
6 in mind what aspect of Part 50, Appendix I, we are
7 actually referring to. We have jumped back and forth
8 a little bit.
9 And when you get into providing limiting
10 condition of operations, which are in the technical
11 specifications, which are basically a safe-operating
12 envelope for a plant, that also blurs that line
13 between what is a safety standard and what is a design
14 criteria. And that is why we get into those
15 discussions.
16 MR. HODGKINS: Thank you.
17 You know what? Brian, did you want to add
18 to the conversation as far as jumping around? I don't
19 want to jump around, but we did. So, let's go back to
20 you.
21 MR. LITTLETON: Brian Littleton with the
22 EPA.
23 I think that I guess, regarding whether
24 any potential changes if we revise the dosimetry will
25 make a difference in the safety of a plant, I think

1 that what may happen is, whether it makes changes in
2 how the plant is operated or not, it could provide a
3 lot as far as public confidence goes.
4 Generally, there are a few, I guess,
5 parameters that the agency uses in our analysis of
6 effluents from nuclear power plants that are just a
7 little bit different from some of the NRC's. But if
8 the public wants for us to run our analysis using our
9 numbers, just to see where they end up, I think that
10 is a useful exercise.
11 MR. HODGKINS: Thank you.
12 We are going to go to the microphone now,
13 No. 2.
14 MR. SCHAFFER: I'm Steven Schaffer. I am
15 a health physicist with the NRC.
16 Speaking for NRO, with every license
17 application, NRO's analysis does include a
18 recalculation of the doses using the ICRP 60
19 methodology, and we do make the comparisons. We keep
20 those comparisons in our back pocket, whether or not
21 we are asked about it. And in all cases, the
22 conclusions still remain the same, that the applicants
23 can comply with Appendix I.
24 MR. HODGKINS: Thank you.
25 Back to microphone 1 and then microphone

2.

MR. DAVIDSON: So, it is Scott Davidson, New World Environmental.

It sounds like we are trying to make regulations so we can justify science. I am a scientist, but I don't think that is where the science belongs. It belongs in implementation or Regulatory Guides or something.

Because when we go back to Appendix I and ODCMs and things like that, the reason for all of this is so we had uniformity of approach. Well, what forces any licensee to be consistent with the Standard Review Guide or the ODCM? If they want to bear the pain of doing it their way, they can do, I believe. Okay?

So, why is this not just something, an industry initiative, better science? I mean, why do we have to legislate these kinds of things? Science constantly advances. We don't have to wait to implement better science. Why is that? I mean the reviewer can review the current science.

MR. HODGKINS: Thank you.

And can we go to microphone 2? And then we will get both for the panelists' reaction.

MR. BLAND: Yes. Stewart Bland with

1 Chesapeake Nuclear Services.

2 I think a lot of good points have been

3 made. I think I will go back to where the industry

4 currently is in Appendix I with the many years.

5 It is pretty much a self-regulating

6 industry at this standpoint. I don't think that we

7 have seen any issues of compliance with Appendix I and

8 the design objectives since the seventies.

9 And that case is, if you look at the

10 regulations, it really is -- and I think Mike's got a

11 good point -- EPA's position, which is to provide

12 flexibility in the application is important. I think

13 there is a real need to allow flexibility in the

14 regulations.

15 We use regulations to establish dose

16 standards, dose criteria, and in this case design

17 objectives. But, then, in the implementation, to be

18 able to use the best available technology and science

19 in evaluating compliance would really go a long way.

20 Public confidence is a key item in this

21 issue. We find ourselves where we are very

22 prescriptive in the dose calculational methods, to

23 where the industry now is presenting calculated doses

24 which are orders of magnitude greater than actual

25 doses.

1 And we have a tendency, then, to use these
2 dose numbers that are presented that are basically bad
3 science. The doses are based upon dosimetric data
4 which failed to recognize that there are dose
5 coefficients for certain radionuclides and certain
6 organs that are not being evaluated. The pathways
7 assessed are overly conservative.
8 So, in general, the numbers that we have
9 out there are overly conservative. Then, they also,
10 because they are not based upon what is really up-to-
11 date dosimetry, they lack an element or could pose a
12 public confidence level, to where we see issues of
13 radionuclides, and we have recently seen it in the
14 carbon-14 issue, to where now that has become a
15 radionuclide of importance. However, over the past
16 years, we have not been assessing the doses. I will
17 even contend that the methods that we have in place
18 will do an adequate assessment of actual doses from
19 carbon-14. So, we need to allow flexibility in the
20 implementation methods.
21 If you also look at Appendix I from a
22 cost/benefit-type standpoint, I don't think that you
23 will find any reactors that have had to add waste
24 processing systems in order to meet the cost/benefit
25 requirement. So you can see improvements in the

1 regulations to simplify some of the processes as well.
2 I will conclude with one item, which is
3 back to the item of you can almost separate a
4 compliance-type assessment, very similar to what we
5 have in Part 20, where you have DACs and ALIs that can
6 be used from a compliance standpoint to demonstrate we
7 are in compliance. Should those be used as a dose
8 assessment? No. They really are not a good technical
9 basis for doing an individual dose assessment.
10 However, they are a very useful tool for showing we
11 are in compliance.
12 Likewise, with Appendix I, you can develop
13 a very simple compliance assessment, but separate from
14 that the ability, then, to do an actual dose
15 assessment.
16 MR. HODGKINS: Thank you.
17 So, two folks from the audience. Is there
18 some panel reaction? Jean-Claude?
19 MR. DEHMEL: Yes. Jean-Claude Dehmel, NRC
20 NRO.
21 I want to just add a point to what was
22 made by the gentleman over there.
23 What is your first name again? What was
24 your name?
25 MR. DAVIDSON: Scott.

1 MR. DEHMEL: Scott.

2 Yes, the reason why the staff is doing the
3 calculations, as brought up by Mr. Schaffer a moment
4 ago, two ways, using ICRP 2 and ICRP 16 methodology,
5 is because we, the staff, have been challenged at
6 times by our own Atomic Safety Licensing Board and the
7 Advisory Committee on Reactor Safeguards.

8 So, we present the results of our
9 evaluation of the safety applications. We write a
10 Safety Evaluation Report. We present that information
11 before these two bodies and we are posed questions.

12 Obviously, there are a number of health
13 physicists on those panels. And they realize that
14 that methodology is outdated, and the question is,
15 what if you were to take that information and pass it
16 to a computer program or a calculational methodology
17 that would essentially apply the benefit, in this
18 case, of ICRP 60, because we don't have any dose
19 conversion factor for ICRP 103 yet?

20 So, we are not doing it to justify the
21 regulations. We are doing those comparative analyses
22 for the purpose of being ready to answer specific
23 questions.

24 MR. HODGKINS: Did you want to react to
25 that, Scott?

1 MR. DAVIDSON: Right. That's great, but
2 if you have this cost to the licensees and it doesn't
3 result in less going into the environment, then you
4 haven't changed the dose, regardless of how you
5 calculate it. Okay? So that doesn't do anything
6 environmentally.
7 Now I don't think you need to do anything.
8 But what is happening, then, is you are improving the
9 science. And do you need to legislate science
10 improvements?
11 I mean I understand why you do it, for
12 uniformity for the benefit of the people who review
13 applications and have to defend why does this licensee
14 do it this way versus this one? And it's more work.
15 Okay?
16 So, let's choose how we want to do our
17 work. Do we want to have it as a unified approach
18 that everybody is going to nod their heads and follow
19 or do we leave it up to the licensed entities to say,
20 "We think we're better off with 50 different things
21 because each of our locations has different pathway
22 factors or populations," or something?
23 If we say it has to be through Reg Guide
24 1.109, Version/Revision what -- I don't know -- so be
25 it. But that's where it belongs, in guidance. You

1 can legislate using best technology, and you already
2 have the best technology. But is the best technology
3 the science or the technology that reduces the
4 effluent? Like I say, now you are in this circular
5 thing.
6 You have two independent things running
7 here. One I think is dead in the water because I
8 don't think you will have any reduction in effluents.
9 You will get the better science. How you get there
10 doesn't need to be the legislative. Or should the
11 industry be allowed to dictate that process? Because
12 they are the ones who will have to demonstrate it.
13 MR. HODGKINS: Thank you.
14 Don, did you want to --
15 DR. COOL: Yes, thank you.
16 Don Cool with the NRC staff.
17 This is a very interesting point of
18 discussion. It is, in fact, part of the reason that
19 the NRC staff is looking for some of this input,
20 because it could be viewed that updating the science
21 is not changing any of the actual effluents. And
22 therefore, a strict decision, which is if you are not
23 going to change performance, there's no reason to
24 change the regulation question, it is a very logical
25 question.

1 On the other hand, the NRC, and I believe
2 most federal agencies under the Administrative
3 Procedure Act, and certainly the NRC under our
4 requirements and under the requirements to do an
5 analysis that is called backfit, looking at how the
6 regulations are used and what changes are made, can
7 also look at some other factors that would be
8 associated with the regulations and guidance.
9 And if, in fact, there would appear to be
10 some compelling arguments that doing an updated
11 scientific approach is a more appropriate approach for
12 an analysis, in order to decide whether or not some
13 changes were necessary in performance or operation or
14 analysis of a system that wanted to go in the place
15 for effluent control, in fact, I think it would be
16 necessary to have that methodology established in a
17 regulatory structure, so that everyone understood what
18 the requirement was, what models were necessary in
19 order to be used in order to do a demonstration.
20 I think Jean-Claude has pointed out that
21 the NRC staff has been challenged not necessarily on
22 the basis that the applicant hadn't made a
23 demonstration of safety, but, rather, that that
24 demonstration of safety wasn't based on methodologies
25 that some people were either more familiar with or

1 more confident of because it represented more recent
2 information.
3 So, the NRC staff is looking today to
4 build the record associated with, what are the
5 benefits and impacts -- and we are going to go to the
6 questions -- the benefits and impacts of updating this
7 technical basis, which if you have in regulation, then
8 gives the NRC staff the basis to change some things in
9 guidance and the basis upon which to request
10 applicants to do a calculation, so that there can be a
11 consistency in how people look at it.
12 Only at that point, if you are using the
13 same approach to things, can you, in fact, have a
14 discussion of whether or not you agree or disagree
15 that some additional action or activity is necessary,
16 or if the proposal being made or the effluents being
17 released from a particular facility are, in fact,
18 where you would want them to be.
19 So I say that little soliloquy to point
20 out that we need to have an understanding not just of
21 "adequate protection" -- put that in quotes -- which
22 is the basis of the NRC requirements, but, also, a
23 clear understanding of the process by which we all
24 articulate the extent to which we all know that that
25 has been achieved. That is another component in

building in our analysis.

Thank you.

MR. HODGKINS: Thanks, Don.

Ralph?

You know, here's the thing: are we going to move on to the questions now or do we still want to leave it open to the general discussion? Because we are about 45 minutes past our break. I don't know.

How about, Ralph, we'll end with you, and then we'll take a 15-minute break and come back and do the questions? All right?

Ralph?

MR. ANDERSEN: Ralph Andersen, Nuclear Energy Institute.

How about if we take a 15-minute break, and then I would like to make a few comments when we come back?

MR. HODGKINS: That would be terrific, Ralph.

We will take a 15-minute break, which means we will be back in the room at 10:20.

Thank you very much.

(Whereupon, the foregoing matter went off the record at 10:05 a.m. and went back on the record at 10:20 a.m.)

1 MR. HODGKINS: Welcome back to our webinar
2 participants.
3 We will start once again.
4 Have there been any questions from the
5 webinar participants at this point?
6 Just a reminder to those folks that are on
7 the webinar to please type in your questions. There
8 will not be a telephone call-in portion. It has been
9 too difficult to manage that with the sound.
10 So, if you will please write in any
11 questions or comments that you would make, and then we
12 will go ahead and read them at the microphone for your
13 point.
14 During the break, too, Ralph, you were
15 usurped. You are not going to be able to make the
16 first comment.
17 And at microphone 2 we have an historical
18 perspective that I think we are going to listen to.
19 (Laughter.)
20 And as the cacophony of laughter started,
21 I got a sense that this guy is a very serious person.
22 All right. So, microphone 2, can you
23 introduce yourself?
24 MR. CONGEL: Yes. My name is Frank
25 Congel. I'm affiliated with Argonne National Lab

1 right. I was, I'm certain that most of you know, a
2 staff member with the NRC for quite a while.
3 And I can give an historical perspective
4 because I had an intimate involvement with
5 implementing Appendix I to Part 50 and I actually
6 wrote some of the text that is in the regulation.
7 What I wanted to do, and I know the focus
8 of this meeting is updating of dose parameters, making
9 certain that we do the best science and what the
10 effects are. But I really want to, at least when it
11 comes to Appendix I, talk about how it evolved.
12 You notice that we talk pretty much
13 exclusively in the old days about thyroid dose, which,
14 of course, related to iodine releases and then what
15 was called total body at the time, which is
16 principally associated with the noble gases.
17 The first test that was done to an
18 essentially accepted design after it was proposed for
19 a specific site was to see if that design could meet
20 all of the Appendix I requirements at the site during
21 its operational lifetime.
22 In order to determine that, the staff
23 started with an assessment of what they thought would
24 be expected radionuclide releases into the primary
25 coolant with the associated cleanup capabilities, and

1 then, subsequently, releases to the environment.
2 Those releases into the environment were called source
3 terms. The source terms reflected staff's best
4 judgment, conservative -- conservative means probably
5 underestimating true capabilities to treat prior to
6 release.
7 You looked at, in addition to the release
8 into the environment, what the potential dispersion
9 via both liquids as well as by the atmosphere to the
10 site boundary. So, five to ten years' worth of
11 meteorological data were gathered, evaluated, and
12 dispersion factors to each point offsite were
13 determined.
14 Thirdly, then, the calculations of dose.
15 The dose was a surrogate. It wasn't a dose to a real
16 person. A site point was picked beyond the site
17 boundary that would expect to have the maximum dose,
18 and, essentially, the radwaste system, as accepted in
19 the design, was evaluated to see if the staff's best
20 estimate was that that plant design could exist at
21 that site and meet the standards. That is the ALARA.
22 But the dose was a surrogate. So,
23 consequently, the discussions around the table here
24 about ICRP 60, 59, and 103 in many respects, from my
25 perspective, are not really relevant.

1 And a proposal that I would make is look
2 at even the statement of considerations at the time,
3 and you will find that that was the method that was
4 followed by the staff. So we can concentrate on dose
5 factors, ALIs, whatever, but the ultimate dose or
6 number that was associated both total body and thyroid
7 dose were really the end result of the staff sequence
8 of analyses, all of which were conservative. And what
9 I mean by that, even the meteorology was done in such
10 a way that you would expect minimum dispersion at this
11 one site over some time period.
12 So, one of the things, again, that we
13 should do is another option would say update Appendix
14 I to Part 50; leave out dose. Because to do this very
15 rigorously totally ignores the meteorology
16 calculations. Was that done accurately by today's
17 standards? I mean I am certain that what we did 30
18 years ago to come up with the chi over qi's is
19 certainly not what is followed today.
20 We also know a lot more about source terms
21 today. We used to assume fail in fuel with leaking at
22 a tenth of a percent. That hasn't been the operating
23 experience at all, but that is what is reflected in
24 those Appendix I numbers that we have on the record.
25 So, consequently, the first proposal:

1 reevaluate Appendix I and whether dose should even be
2 used prior to going down the path of the best and
3 accurate way to calculate dose, when dose wasn't even
4 the ultimate purpose for Appendix I. I think it is
5 very fundamental and a very important question.
6 Secondly, when it comes to NEPA, we then
7 did similar calculations to characterize what the
8 long-term impact would be from their plant operation.
9 We assumed it would be 40 years.
10 So, again, source term, chi over q's, and
11 then estimates of doses offsite, population centers,
12 site boundary, and so on, now those values would be
13 amenable to updating for future plants. However, to
14 characterize what the impact would be over the long-
15 term I still think is valid to account for the
16 uncertainty that we knew was inherent in our approach,
17 because we thought it was conservative, it would
18 overestimate, but we really didn't know. My gosh, we
19 were doing this in the early seventies.
20 We had what was a very comprehensive
21 offsite monitoring program. This was to back up, what
22 we said on paper, it was for impacts. My
23 understanding after reviewing years' worth of
24 environmental data, that the environmental effects
25 offsite, buildup in the grounds, crops, water, were

1 nowhere near what we had estimated to be the case for
2 NEPA purposes. So, we felt we had very safely and
3 very reasonably characterized what would happen.
4 But I'm getting off a little bit. The
5 fundamental point, instead of spending time about ICRP
6 103, 60, and so on, and Appendix I, my recommendation
7 is back off, look at what you have to do in order to
8 assure compliance with the regulation itself, which
9 has the four parts, and don't use dose in any way as a
10 surrogate to ensure that the design is compatible with
11 the site.
12 That would eliminate a lot of the
13 discussion. Then, at least, you can move on to the
14 other part of the regulation that truly had an
15 expectation of the best science to do the calculation.
16 Appendix I, NEPA calculations, they were
17 the best we could do at the time, but when it comes to
18 that site boundary dose, I would put "dose" in
19 quotation marks because we could have picked a series
20 of different parameters, ionization at that point,
21 estimated -- a number of things.
22 But I think listening here, and I
23 apologize I missed the early part of the meeting
24 because I had another meeting, that it probably would
25 get you into a corner by trying to do this supposedly

1 more accurately in the dose field, when the other two
2 critical parameters that go into this are not being
3 addressed: estimate of source term, estimate of
4 offsite dispersion.
5 MR. HODGKINS: Thank you very much.
6 So, Ralph, you're next. All right.
7 MR. ANDERSEN: Ralph Andersen, Nuclear
8 Energy Institute.
9 My comments weren't intended to address
10 Frank's comments. Rather, they were intended to
11 address some of the earlier points that were made,
12 particularly on the issue of updating regulations
13 driven by scientific updates, which was an interesting
14 topic of discussion for some time, particularly led by
15 Commissioner McGaffigan.
16 So, I would point out there was actually
17 some very good documented discussions at the
18 Commission level during the time that Commissioner
19 McGaffigan was there that were on that very topic,
20 about whether regulations should be updated per se to
21 follow the science.
22 I want to reinforce Scott's comment. I
23 don't see science as a driver for updating
24 regulations. What I see is that the update in the
25 ICRP recommendations, which is reflective of an update

1 in the science, as an opportunity to address other
2 issues.
3 These issues are more related to the
4 burdens that are imposed by hanging onto to the ICRP 2
5 methodology, among which and one that we have
6 highlighted several times is the inconsistency with
7 other parts of the regulation that we have to comply
8 with, which requires that we sort of carry two sets of
9 books.
10 Secondly is, in the current NRC licensing
11 space, not only the applicants, but also the staff has
12 told us they have got to carry two sets of books for
13 defense-in-depth with their reviewers and their
14 critics.
15 Additionally, we have multiple criteria
16 that we need to demonstrate compliance with as an
17 artifact specifically of using ICRP 2 as opposed to
18 using ICRP 26, 60, or 103. All of those integrate
19 internal and external dose, so that you don't have to
20 carry all these separate criteria, including
21 highlighted criteria like iodine and noble gases and
22 other things. So, there's a lot of opportunity for
23 improving the efficiency in demonstrating compliance
24 as well.
25 Those are the drivers for the industry.

1 Otherwise, we would have been much more vehement at
2 the time of the change of Part 20 previously. But,
3 over time, those burdens have played out.
4 The final point Don made is that we now
5 actually have the unique issue where graduate students
6 in health physics that come to work for us have to be
7 trained on this arcane methodology, so that they can
8 do their job. They don't necessarily come equipped
9 with that full knowledge of ICRP 2 with their
10 education. So, that additionally imposes a burden,
11 and it also opens the opportunity for error.
12 So, from a human factors point of view,
13 this also isn't a good thing. Ultimately, it led to
14 one of the landers on one of the planets, I guess the
15 moon, crashing into the moon.
16 So, there's a variety of reasons why we
17 are supportive of updating. But, again, I just want
18 to stress that the science itself is the opportunity,
19 not the driver.
20 MR. HODGKINS: Okay. We will move to the
21 questions then. And I see that we are at Question 1-2
22 because we pretty much handled Question 1.1.
23 Yes?
24 MR. DEHMEL: Yes, that is correct.
25 MR. HODGKINS: Okay.

1 MR. DEHMEL: We went around; we had a
2 roundtable discussion and questions on that issue.
3 So, Question 1-1 we have covered already. So, now we
4 are looking at two questions, 1-2 and 1-3.
5 MR. HODGKINS: Okay. And so, you guys can
6 read, but for the sake of the webinar participants,
7 too, although they have this same slide up on their
8 thing, on their screen:
9 "What is the scope of operational impacts
10 and costs in updating programs and procedures given a
11 revision of 10 CFR Part 50, Appendix I, design
12 objectives and NRC guidance?
13 "Please identify specific types of impacts
14 that the NRC should consider in implementing a
15 revision of 10 CFR Part 50, Appendix 1" (sic) "design
16 objectives and NRC guidance to ICRP Publication 103
17 recommendations."
18 Carolyn, is there anything that you would
19 like to add to that discussion?
20 MS. HILL: I don't think I really have
21 anything I can add right here. I don't really have a
22 good grasp on how it would impact the programs, rather
23 than very general, of course, it's going to impact
24 procedures and training and things like that.
25 MR. HODGKINS: Okay. Thank you very much.

1 Ed?

2 MR. ROACH: This is Ed Roach.

3 I have nothing else to add. We are trying

4 to gain stakeholder input on this.

5 MR. HODGKINS: Okay.

6 MR. ROACH: We have done our initial

7 evaluation in-house. So, we are looking for

8 additional input.

9 MR. HODGKINS: Additional inputs? Mike?

10 MR. BOYD: Mike Boyd, EPA.

11 I don't think I have anything to add,

12 either. Just to point out to you it's Appendix I.

13 MR. HODGKINS: Oh, not "1".

14 MR. HAYNES: Larry Haynes, Duke Energy.

15 I guess the overall perspective for the

16 change is just thinking through how we implement at

17 our facility. There's computer codes, procedures,

18 training. So that is the big impact that we will have

19 to absorb that. There's no way around it.

20 The things that Ralph said, we talked

21 about the benefits, and where we end up at the end of

22 the day, my opinion, it's worth the effort to get

23 there. We know that it will be an expensive

24 undertaking.

25 The last time we changed Part 20 we had a

1 whole team assigned to it, and it was years to work
2 through that. And that will just have to be the way
3 it is.
4 That would be my preference, too, if we
5 talked about Part 20 and Appendix I at the same time,
6 so that team could address it all in one approach
7 versus having to do it in two different activities.
8 MR. HODGKINS: Thank you, Larry.
9 Brian?
10 MR. LITTLETON: Brian Littleton with the
11 EPA.
12 I probably will answer this question by
13 talking about what the agency must do, the EPA must
14 do, in order to get a rule out. And that's that we
15 are required to do, and I think the same requirements
16 apply to the NRC, to estimate the impacts to the
17 State, the impacts to industry, and then, also,
18 provide information on the impacts to our programs.
19 With our programs, you know, those types
20 of estimates are how much FTE it takes to get a rule
21 out, contractor dollars. I believe all that has to be
22 public knowledge.
23 But the important aspect of this is that
24 we do have to develop, I guess, considerations of the
25 impacts to the states in implementing our regulations,

1 changes, any changes that we make, as well as the
2 impacts to industry. It is something that, I guess
3 for those who aren't aware -- and I'm speaking
4 probably more to those out there in the public, that
5 they should take a look at it, and then industry needs
6 to be aware that, if somehow we underestimate or
7 overestimate those impacts, that they can weigh-in on
8 those as well during the proposal part of our
9 standard.
10 MR. HODGKINS: Thank you.
11 Roger?
12 MR. PEDERSEN: Well, being part of the NRC
13 staff, I am part of the contingent here that is,
14 hopefully, on the receiving end of this. We are
15 looking for input from our stakeholders in the
16 industry as to what specifically the impacts would be
17 and the costs associated with any of the changes of
18 these options.
19 The only thing I would add, however, is
20 that since we are a fee-recoverable agency, changes
21 that were somewhat referred to earlier, such as
22 changing our inspection program, training our
23 inspectors to whatever changes we make in the
24 regulations, changes to the reactor oversight process,
25 are all costs that the industry will ultimately bear.

1 So, there's some indirect costs there that I guess
2 should be kept in mind, although I am not sure that we
3 can be any clearer as to what those specific changes
4 would be at this point.
5 MR. HODGKINS: Thank you.
6 William?
7 MR. SMITH: William Smith with Southern
8 Nuclear Company.
9 One of the major changes I have thought
10 about is related to the Offsite Dose Calculation
11 Manual. This would be different for -- currently,
12 operating sites probably have as many as 15 to 20, 30
13 different ODCMs that meet the same purpose. But, for
14 the new operating, new licensed plants, they have
15 committed to a radiation protection template that is
16 an Offsite Dose Calculation Manual that will ensure
17 that all of the new programs are consistent.
18 So, one of the challenges for an operating
19 plant that is building a new plant would be the need
20 to integrate those two programs. So, the timing of
21 any integration of programs would be critical when
22 you're getting ready to start up a new plant and you
23 are also trying to change programs to meet new license
24 requirements.
25 But that, within itself, could be an

1 opportunity to plan some efficiencies in the way that
2 this new rule is implemented, based on the way the
3 rule is written and the way it is required and who is
4 required to implement it.
5 And if you had a single-type Offsite Dose
6 Calculation Manual that was approved by the NRC that
7 all of the utilities were using, that would also
8 reduce some of the cost of the utilities, and that
9 might also lead to some standard programs that the NRC
10 could have developed that utilities could use. So
11 that would also reduce one of your costs.
12 And one of the other programs that I can
13 think about that the Offsite Dose Calculation Manual
14 feeds into is your emergency planning. I think we
15 mentioned something earlier about the protective
16 action guidelines.
17 The way utilities calculate that is using
18 the Offsite Dose Calculation Manual. You typically
19 come up with the values that you will take actions
20 based on calculating that dose of whatever the number,
21 1 rem, 5 rem. So, when you change the methodology in
22 your Offsite Dose Calculation Manual, you are also
23 changing aspects of that program and your emergency
24 action levels that you're using at the sites.
25 And there are several more items, but

1 Ralph will present those to you.

2 MR. HODGKINS: Ralph?

3 MR. ANDERSEN: Ralph Andersen, Nuclear

4 Energy Institute.

5 Hopefully, I'll touch on some of those.

6 In addition to the things that have been

7 mentioned, I come back to the element, too, of looking

8 at the design certification and the COL process and

9 consider both the impacts and the benefits that are

10 inherent in that.

11 I take the word "impact" to be neutral as

12 far as whether it is a positive impact or a negative

13 impact. But I think, looking forward, there could be

14 a substantial benefit moving forward there with

15 probably less impact than on the currently operating

16 facilities.

17 This question also needs to be connected

18 with the discussion later. We will need to revisit

19 this somewhat when we talk about required versus

20 voluntary and issues like that.

21 But the other thing that the NRC would

22 need to look at, and certainly we would, would be a

23 change to the cost/benefit provision within Appendix

24 I. We have been talking a lot about the dose

25 provision, but Frank Congel I think had alluded to the

1 rule does a lot more than have some dose criteria.

2 Presumably, the change in values, I know

3 one offering has been from 1,000 to 2,000, but that

4 could change, too. That is dollars-per-person rem

5 that would drive consideration of changes to the

6 radwaste processing systems.

7 One would think that would not have any

8 significant impact on either current or future

9 designs, but, clearly, that would be a significant

10 aspect to look at as well, again, for completeness.

11 MR. HODGKINS: Thank you.

12 Now we've got 15 minutes left for this one

13 discussion item. So, do you want to go through the

14 questions more quickly or how do you want to handle

15 that, Jean-Claude?

16 MR. DEHMEL: Well, let's go through the

17 question and see what kind of responses we may get and

18 questions or inquiries.

19 MR. HODGKINS: Okay.

20 MR. DEHMEL: So, the next one -- I presume

21 we're finished with this one. The next one has to do

22 with, are there any estimates of the cost that would

23 be incurred by utilities or stakeholders with respect

24 to changing the regulations? Obviously, we are not

25 expecting any cost information right now.

1 But with respect to having to revise the
2 operational program, implementing procedures, computer
3 codes, and personal training, these are the kind of
4 costs, broad cost considerations that we have
5 identified so far. They may be a structure that the
6 industry may provide to us with some specific
7 information.
8 We have identified whether or not it is
9 feasible to segregate the costs with respect to a PWR
10 or BWR, maybe a generic power plant, which perhaps may
11 be the easiest way of doing it, but we're leaving that
12 option to you as to how you would present the
13 information.
14 There is some debate whether or not, you
15 know, are the cost differences such that there is a
16 notable difference between a PWR and BWR, and we will
17 let you make the determination. A case could be made
18 that there is no significant difference, in light of
19 the other estimates that you have to generate. So
20 those may be lost in comparing the respective error
21 bands on each of the estimates.
22 And the other thing that we are interested
23 essentially is getting in an aggregate cost for all of
24 the operating fleet of reactors, if it is possible.
25 So, either you provide us the tools and the

1 information for us to do an analysis on a plant basis,
2 and we can do the multiplication, or you go ahead and
3 provide a single unit cost, and then an aggregate cost
4 over the entire fleet of power plants.
5 So, this is essentially a request for
6 supporting information.
7 MR. HODGKINS: Is there any reaction from
8 the panel on that? Okay, let's go around then. And I
9 won't go all the way around the table, just those who
10 have a reaction to it, then, or a comment.
11 MR. ANDERSEN: Yes, my initial reaction is
12 that I think it would be difficult to provide
13 meaningful quantitative information in the absence of
14 a strawman of what would actually be proposed.
15 I would comment that, given what your
16 current challenge is in terms of providing a SECY back
17 to the Commission, my recommendation would be to try
18 to stray away from any inference that meaningful
19 quantitative information can be provided at this
20 point. I mean the best we could do, and I think we
21 could attempt that, is to make some reference back to
22 what we spent before to change things under Part 20,
23 but Part 20 isn't Appendix I. As you point out, there
24 could be differences between plant types that would be
25 relevant.

1 Now, personally, I would suggest that the
2 appropriate time to do that would be following an
3 affirmative Commission decision to go forward, would
4 be in the form of an ANPR. That is where I would
5 really reside, is as an advanced step to actually
6 formulating a proposed rule, would be to actually put
7 out an Advanced Notice of Proposed Rulemaking in which
8 people can respond to specific proposals and address
9 that issue more robustly.
10 But, otherwise, it is difficult to know.
11 In this case, there's so many options for what a final
12 rule -- or excuse me -- a proposed rule might look
13 like. I'm not sure the data might not be misleading,
14 but I will defer to some of my colleagues to offer
15 their thoughts.
16 MR. HODGKINS: There were some head nods
17 to some of your comments, Ralph. Is that just
18 echoing, amplifying his comments, or is there
19 something else that you would want to say?
20 Roger, anything to add or a new topic?
21 MR. PEDERSEN: I was going to see if
22 anybody responded to your question before I raised
23 something new.
24 MR. HODGKINS: Oh, Michael did.
25 MR. BOYD: Mike Boyd, EPA.

1 This is not an EPA comment, but I also am
2 on the Nuclear Energy Agency's Committee on Radiation
3 Protection and Public Health.
4 And just because I don't see any of the
5 NRC folks in the room that work with me on that
6 Committee, but just to let you know that the CRPPH,
7 that Committee, has, in response to a request from
8 NRC, has undertaken a survey of European and Asian
9 countries to try to get estimates of their cost of
10 moving from ICRP 26 to ICRP 60, just to get a handle.
11 This is much broader question than 50,
12 Appendix I, but there may be in that fairly lengthy
13 questionnaire that's being circulated some information
14 that could be of use in this process.
15 And another comment I wanted to make is
16 that, reflecting a comment that Mr. Smith made about
17 the ODCMs being standardized, I think for new reactors
18 now there does seem to be a very ripe opportunity,
19 say, for a class of reactors, whether it's EPPR or
20 AP1000, or whatever, developing some standard
21 techniques that would reduce the overall cost on
22 individual utilities.
23 MR. HODGKINS: Thank you.
24 Another comment? Roger?
25 MR. PEDERSEN: Actually, that segued right

1 into the comment I was going to make.

2 Since we're asking people to provide us

3 cost estimates as best they can, with deference to

4 Ralph's comment that this might not be the right time,

5 but my question was whether you can work in economies

6 of scale, if standardization of procedures, computer

7 codes, would lower the cost per reactor as opposed to

8 doing it on a piecemeal basis through the industry,

9 you know, if the industry could get together and

10 develop these standards similar to the process that

11 was referred to earlier of the templates that are

12 being used in the new reactor licensing.

13 MR. DEHMEL: Jean-Claude Dehmel.

14 I just wanted to point out that we are

15 looking for that kind of information for the purpose

16 of reaching our management. Whether or not this

17 information makes it into the SECY paper is another

18 matter.

19 But, invariably, as the staff develops its

20 draft SECY paper, the attachment to the policy paper,

21 invariably, our management, our Radiation Protection

22 Steering Committee initially, and then, ultimately,

23 the TAs before the Commission, there will be some

24 questions. You know, does the NRC staff at that point

25 have a kind scoping estimate of what these costs might

1 be? It's for that purpose.

2 We understand that, when we go into a

3 rulemaking process, it is a completely different realm

4 and there is a process to obtain information, a

5 recourse, that more specific information, we

6 understand, but we are not there yet. But,

7 nevertheless, there may be some questions raised about

8 costs.

9 Let me move down to the next slide.

10 MR. HODGKINS: Wait a second. I think

11 we've got William.

12 MR. SMITH: Yes, to respond to one of the

13 comments that Roger made about standardizing some of

14 the programs.

15 Well, we did have the effort for the new

16 plants related to radiation protection programs and

17 some of the other programs, but, also, there is an

18 industry working group related to one of the designs,

19 the AP1000. There are programs that are being

20 developed right now, and there are also what they are

21 calling templates of programs and schedule that is

22 being developed that would standardize programs across

23 operations, chemistry, instrumentation, and all of

24 those disciplines are feeding into that.

25 And I'm working with the group for the

1 radiation protection part of that. One of the things
2 that it will do is, backing out from the 2016 startup
3 date, come up with dates that programs will be ready,
4 and then that would also factor in the NRC inspections
5 that need to happen. That is in the early stages
6 right now.
7 And one of the other things that it is
8 doing is identifying any risk to different programs
9 based on changes in regulations. Of course, this
10 would be a risk to the program, and we will come up
11 with some way to manage that, you know, how we address
12 the changes that need to be made. Something like that
13 will probably easily go across the industry and come
14 up with a new program.
15 MR. HODGKINS: Thank you.
16 Jean-Claude?
17 MR. DEHMEL: Jean-Claude Dehmel, NRC.
18 This is the last question in this issue
19 section having to do with, if we were to revise this,
20 and understanding that there's got to be essentially
21 some synchronization between a Part 20 rulemaking and
22 a Part 50, Appendix I rulemaking.
23 The question, then, should there be two
24 separate rulemakings or should there be one
25 rulemaking? So, this is kind of also left as an

1 option to discuss and determine whether or not, for
2 example, you could see that the Part 50, Appendix I,
3 could be, as we noted again earlier by Mike Boyd, that
4 it could be separate from the Part 20. But, in the
5 end, whatever we do decide to do with Part 50,
6 Appendix I, the dosimetry considerations, they would
7 have to be consistent with whatever has been adopted
8 in the Part 20.
9 So, another possibility would be to have
10 two separate rulemakings, but one offset in time. For
11 example, we might have Part 20 first, and then start
12 at some time in the future, an offset of six months or
13 eight months and maybe a year, a rulemaking for Part
14 50, Appendix I, in the hope that during that initial
15 time period, that offset time period, a decision will
16 be made as to how we would adopt ICRP 103
17 recommendation into Part 20, and then extract that
18 basis and slip it into the Part 50, Appendix I,
19 rulemaking process.
20 So, we would like to have some thoughts
21 about that.
22 MR. HODGKINS: Any reaction from the
23 panel, then?
24 Okay, let's start. Ralph?
25 MR. ANDERSEN: Ralph Andersen, Nuclear

1 Energy Institute.

2 I would strongly recommend that you

3 consider pursuing this, if they go forward as two

4 parallel rulemaking efforts. And there's a number of

5 reasons for it, but I will just touch on a few.

6 From a logistics point of view, Part 20

7 involves the totality of NRC licensees and the

8 totality of NRC agreement states. Changes to Part 50,

9 Appendix I, include Part 50 licensees only, and

10 because of preemption, in effect, do not involve the

11 agreement states or the states themselves, although

12 some states, at their own volition, do have some

13 informal oversight process that they have instituted

14 for power reactors. But, in essence, you're dealing

15 with a very limited community. So, just from a point

16 of view of the logistics of the types of activities

17 you would engage in in a rulemaking, that would argue

18 for two parallel rulemakings.

19 Secondly, I believe that the underlying

20 issues in both are substantially different, although

21 they share a commonality and the possible methodology

22 that might be employed. And again, I harken back to

23 comments previously by Frank Congel and others.

24 This rule is for categorically different

25 purposes. Actually, to your own comment, Jean-Claude,

1 that Part 50, Appendix I, serves a different function
2 than does Part 20, in regulatory space, your comment
3 about safety standards versus other types of criteria.
4 And I think you would create a lot of
5 confusion if you try to combine the two rulemakings.
6 So, that, to me, would be another reason to pursue
7 parallel.
8 Thirdly, in terms of process, you know, I
9 had already mentioned that in the case of Part 50, you
10 are going to likely need to solicit certain
11 information to support the regulatory analysis, and
12 particularly to address the backfit issue that we will
13 talk about later, that probably will be quite
14 different than what you would need to do for the
15 update to Part 20.
16 And again, I think that trying to go out
17 commonly to everyone and say, hey, we want all of this
18 information, and, oh, then, stop reading here, and for
19 the rest of you we also want this kind of information,
20 again, could undercut your effort and make it less
21 efficient.
22 And then, finally, our high-level
23 recommendation remains intact, which is that we will
24 be encouraging that NRC, and then, additionally, the
25 federal family, be looking at creating better

1 harmonization between all of its regulations. Then,
2 in the NRC case, we will be arguing for consistency,
3 not just harmonization.
4 So, we will be asking, both in our comment
5 letter and in future interactions with the Commission,
6 that the Commission look at updating Part 20 and
7 making conforming changes throughout all of its
8 regulations, to establish a common methodology, i.e.,
9 ICRP 103.
10 That would not capture Part 50 in its
11 totality, except in a consistency and method. We
12 would still see Part 50 needing to go its own way for
13 a rulemaking, just as Part 61 would have to go its own
14 way for a rulemaking. But we would like to see Part
15 20 include conforming changes to the other
16 regulations, as needed, to get everybody on the same
17 technical basis.
18 MR. HODGKINS: William, did you want to
19 add to that?
20 MR. SMITH: This is William Smith with
21 Southern Nuclear Company.
22 The only thing I will add to what Ralph
23 mentioned on the two parallel paths, and that's the
24 last part of it, is a common implementation date.
25 That would really be critical in change in management

1 and rolling out your training and your procedures
2 changes, you know, by having a common implementation
3 date and, as he mentioned, in harmonization with the
4 other agencies' changes.
5 MR. HODGKINS: Any other reactions, then,
6 from panelists? Larry?
7 MR. HAYNES: I think I have got it all. I
8 agree with Ralph. I think one point I would make, in
9 addition, parallel would be, obviously, being
10 completely different aspects to try to be parallel,
11 but they need to be synchronized. As William said, we
12 end up with implementation dates that teams can
13 approach together that we have a single approach to
14 it.
15 I thought I had two, and in listening to
16 the comments about the purpose of Appendix I, would it
17 be reasonable or something to consider, take the
18 operational aspects out of Part 50, Appendix I, and
19 put those in Part 20, and leave the design criteria
20 aspects in Part 50 and 52, and separate the two?
21 Then, maybe we end up with the operational aspects
22 over in Part 20.
23 MR. HODGKINS: Thank you.
24 Anyone else from the panel, then, want to
25 discuss that?

1 (No response.)

2 We will close, then, the discussion on

3 Question 1 with any audience feedback or any webinar

4 feedback. Is there any?

5 (No response.)

6 Give them a couple of minutes, seconds, to

7 respond.

8 We are two minutes over our agenda. We're

9 good.

10 Let's go on, then, to Question No. 2, the

11 options.

12 MR. DEHMEL: Jean-Claude Dehmel, NRC,

13 again.

14 So now we are talking about the issue of

15 making the changes to Part 50, Appendix I, available

16 as an option to all operating licensees as well as

17 applicants or making it a required implementation.

18 So, let's go to these options.

19 If we had a voluntary implementation,

20 then, on option 2a, we would have to retain the

21 current guidance to current requirement, because that

22 would have to be available with the option of

23 implementing or not implementing the revised Part 50,

24 Appendix I.

25 The other option would be to item 2b,

1 would be to make it specifically available as an
2 option for currently licensed and operating power
3 plants, using in this case two separate sets of
4 Appendix I regulations and guidance.
5 So, we would have the existing Appendix I
6 standing as it were. We would develop a separate
7 Appendix I that would essentially represent or capture
8 all of the revisions, all the changes, and a parallel
9 set of Reg Guides. The licensees and applicants,
10 then, at that point could apply whichever set of
11 requirements were selected or opted for.
12 So, the effort, obviously, on Section 2b,
13 we would have to develop a parallel set of guidance
14 documents, computer codes, and so on. So, whether or
15 not we would essentially have another Reg Guide 1.109
16 or there could be a Part a and b to existing Reg Guide
17 1.109. That would have to be addressed separately.
18 Similarly, with the computer codes, that
19 obviously would have to be completely different
20 computer code, self-standing computer codes.
21 The basic NUREGs, 1301, 1302, on the
22 Offsite Dose Calculation Manual, the surveillance
23 requirements, and the action requirements, that would
24 have to be perhaps another set of guidance documents.
25 Item 2c would be a situation where the NRC

1 would impose the implementation of Appendix I on all
2 power plants and all applicants with respect to -- and
3 it would, obviously, consider an implementation date
4 that would be sometime in the future.
5 So the thought is that we have these
6 options. Whether or not there are any alternate
7 options to this, we are going to leave it open, and
8 maybe we can just go around the table and start
9 talking about whether or not there are already some
10 options and what would be some of these options.
11 MR. HODGKINS: Round robin, let's go.
12 Ralph, you're first.
13 MR. ANDERSEN: Ralph Andersen, Nuclear
14 Energy Institute.
15 Looking ahead, also, at the questions you
16 have following this, these are the right questions to
17 ask, but I will just comment that, in a sense, these
18 are chicken-and-the-egg questions. But most of us, if
19 not all of us, here are quite aware of the backfit
20 provision in 10 CFR 50.
21 What I would suggest is that there has to
22 be an iteration between proposing what the NRC would
23 do and why it would be doing it and evaluating how it
24 is stacks up against the backfit provision.
25 In essence, the way to do that is to do a

1 backfit analysis. No matter how you cut it, if you
2 intend to apply this requirement or these changes to
3 existing facilities, it is, by definition, a backfit;
4 i.e., you would be changing your regulatory position.
5 Given that, then you already know that you
6 will need to do a backfit analysis. Backfit doesn't
7 mean that you can't do it. Backfit means that you
8 have to do an analysis against the criteria in Part 50
9 and determine whether you can and should go forward or
10 not, whether the backfit is justified.
11 So, I think, rather than spending a lot of
12 time in discussions phase not only here, but going
13 forward with your SECY and everything else, from a
14 procedural point of view, I don't see that you have --
15 you could either decide at the outset that, for
16 whatever curious reason, you want to write a
17 regulation that only applies to new plants.
18 Now there was a justification for 10 CFR
19 20.1406, that that choice was made at the outset. And
20 that is the minimization of contamination that applies
21 only to new applications. And there were reasons why
22 the staff determined that that would only apply to new
23 plants. Of course, more recently, the staff has
24 determined that they want to apply it to operating
25 plants as well, but that's another story.

1 But I would say that, absent any reason
2 why you would only want to update this regulation for
3 new plants, that the question, rather, should be, what
4 should the elements that should be covered in the
5 backfit analysis be that might influence the model
6 that you use to do the backfit analysis? Because
7 you're going to end up having to do one. Unless you
8 decide not to change the regulation, you're going to
9 end up doing a backfit analysis.
10 In every other area, updates to Reg Guide,
11 and so forth, the staff has chosen to punt and simply
12 say, well, we're not going to require this for new
13 plants, so we don't have to do a backfit analysis.
14 This is an area where I would suggest to you that a
15 backfit analysis is not only necessary, it is highly
16 desirable, because I think it will lead you to
17 conclusions about what the ultimate rule should look
18 like, if you are going to go forward.
19 So, anyway, that's my input.
20 MR. SMITH: Nothing additional for that.
21 MR. HODGKINS: Brian?
22 MR. LITTLETON: This is an issue that I
23 guess some of the discussions that we had earlier
24 today kind of fed into, and that happened to deal
25 with, I guess, whether you all were implementing

1 portions of the EPA's standard through some of the
2 constraints provided in the Appendix I requirements.
3 And to that, I would say that, if that's
4 going to be the case, if it's the case in the past,
5 and I think it is, and if it has the potential of
6 being the case in the future, and I think that it
7 does, then I would say that I would not be in favor or
8 the agency probably would not be in favor of making
9 these requirements voluntary. We would be looking
10 towards probably making them mandatory.
11 MR. HODGKINS: Thank you.
12 Larry?
13 MR. HAYNES: With the assumption that we
14 did all the things Ralph talked about and say, okay,
15 we're going to revise Part 50, Appendix I, I could see
16 plants that aren't going to build a new plant on or
17 near their site saying, why should I change? So, if
18 it was voluntary, probably not.
19 Then you end up with plants that would
20 voluntarily change, and those that had plants on the
21 same site or a utility that had multiple existing
22 plants and a new plant, why would I not have
23 everything on the same basis and would make the
24 change? So there would probably be a split if it was
25 voluntary.

1 The downside to that would be, then, from
2 a benchmarking standpoint for utilities going down the
3 road, in addition to all the complications of having
4 Part a and b to different Reg Guides and NUREGs, we
5 will lose the bubble on apples-to-apples comparisons,
6 and it would just be complicated.
7 So, it would be my opinion that, if we're
8 going to do it, let's just all do it, make it
9 mandatory, and go on with it.
10 MR. HODGKINS: Michael? Ed? Carolyn?
11 MS. HILL: I think the only thing I would
12 add is that I thought that one of the arguments of the
13 NRC was that they wanted to decrease the regulatory
14 burden of having two dosimetry methods. And it seems
15 by having the voluntary implementation, you would
16 actually, then, be increasing that burden by keeping
17 up with an old set of regulations and a new set of
18 regulations. I think it would also come down to the
19 public as being difficult to defend the dual positions
20 to somebody outside of the field.
21 I guess that is the only thing I would add
22 at this point.
23 MR. HODGKINS: Thank you.
24 Okay, do you want to go on to the second
25 one?

1 MR. DEHMEL: Jean-Claude Dehmel, NRC.

2 This Question 2 addresses itself, if the
3 revision to Part 50, Appendix I, were mandatory, what
4 kind of implementation time period should we be
5 talking about?

6 We obviously would not, could not
7 implement, you know, force the implementation
8 literally overnight. So there has to be an
9 implementation phase for document revision,
10 procedures, training, the computer code updates, as we
11 have talked about and panel members have identified,
12 rightly so.

13 And looking back at what was done with
14 Part 20, it was a three-year, I believe,
15 implementation phase. Are we envisioning this to be
16 more complex or less complex than what was done on the
17 Part 20 revision?

18 MR. HODGKINS: And again, how about let's
19 start at this end. Anything to add, Carolyn? Ed?

20 MR. ROACH: This is Ed Roach.

21 I think from our perspective, reasonable
22 timeframe to implement the regulation is necessary,
23 and that is something that would really be determined
24 a little farther down the line when we get our hands
25 around the full-scope and the issues that are

uncovered.

So, although these are some good guesses for when it would happen, it is likely that we would have to get the specifics of what issues the licensees and the agency face first.

MR. HODGKINS: Beautiful.

Michael? Larry?

MR. HAYNES: Basically, the same comment Ed had, and the assumption that Part 20 and Part 50 would be parallel and synchronized. That would indicate really how long it took to implement either of those.

MR. HODGKINS: Thank you.

Brian?

MR. LITTLETON: You're going to hear the same thing from me. I think that, as I think about this, if we were doing a standard there, generally, as we go down the process, there generally becomes, I guess, a time where you say, considering the types of changes that you're proposing, that will kind of tease out what type of implementation period seems realistic. So, I am kind of in line with saying the same thing, that it will probably clear up as you go down the process.

MR. HODGKINS: Excellent.

1 Roger?

2 Needs a microphone. Ralph's been using

3 the microphone too much, huh?

4 MR. PEDERSEN: Yes, that's fine.

5 I agree with the statements that have been

6 made that the implementation period should be somewhat

7 reflective of how extensive the changes are that would

8 be made, which, of course, we don't have a good vision

9 of at this point.

10 But the last question that was asked,

11 whether this implementation, even if it is

12 synchronized with Part 20, would be more complex or

13 less complex than the 1990 three-year implementation,

14 the 1990 change to Part 20 that we provided a three-

15 year implementation for. That rulemaking, I mean

16 there was a significant paradigm shift between ICRP 2

17 and ICRP 26. A lot of that three-year implementation

18 was an educational period. We assumed people needed

19 to get up-to-speed on these concepts.

20 So, I can't see that this implementation

21 of 103, and even synchronized with Appendix I, would

22 need that much retraining, if you will. So I am not

23 sure that the implementation period, I can't see

24 anything that would require it to be any more than

25 three years, and it would seem to me it could be

1 substantially less.

2 MR. HODGKINS: Okay. William?

3 MR. SMITH: William Smith with Southern

4 Nuclear Company.

5 I do not believe it would be as difficult

6 as the 10 CFR Part 20, but one of the other things

7 that we would have to consider would be the phase that

8 the new plants are in, when this comes out, and the

9 implementation phase. Because, currently, if you are

10 developing procedures and programs right now for a

11 plant that you plan on operating in 2016, if this came

12 out in 2014, you would have to have that program

13 changed, if you had a two-year implementation period.

14 So that is one big consideration for the new plants.

15 MR. HODGKINS: Thank you.

16 Ralph?

17 MR. ANDERSEN: Ralph Andersen, Nuclear

18 Energy Institute.

19 Yes, to echo William's point, I think

20 consideration needs to be given to that situation with

21 new plants receiving their COLs and then coming into

22 operation.

23 Probably the largest consideration, and

24 our biggest lesson learned from Part 20, though, the

25 implementation date for either Part 20 or Appendix I

1 to 10 CFR 50 needs to be conditioned to the very last
2 issuance of the very last supporting document,
3 software code, or whatever. Ideally, those would all
4 be issued at the same time that the final rule is
5 issued. That is always our recommendation to the NRC,
6 that issuance of the final rule be accompanied with
7 issuance of the final guidance documents.
8 But where that is not the case, what we
9 have always recommended is that the implementation
10 date should be conditioned to the issuance of the very
11 last Regulatory Guide that will be necessary to do the
12 implementation. Otherwise, we find what we found with
13 Part 20, which what Roger didn't mention was that,
14 actually, the implementation date had to be revised.
15 That was primarily because not all the Reg Guides were
16 available to implement the requirements.
17 So, as far as scheduling implementation,
18 what needs to be taken into account, depending on the
19 scope of the change, is all of the Reg Guides and
20 codes and things that you alluded to, and what the
21 reasonable schedules for revising those with due
22 public comment, and so forth, and issuing those in
23 final form, would be, and then targeting
24 implementation to follow behind that.
25 And that's really, as I think we all know,

1 the lion's share of the work is not changing the
2 simple wording in Appendix I. The lion's share of the
3 work is in all the supporting guidance.
4 So, I will make another comment at the
5 same time. Please, if you go through this process,
6 and I won't be around to watch the tail-end of it, at
7 least not actively, issue consolidated guidance. I
8 think we have got some 20 Reg Guides currently
9 associated with this, and I think it would be very,
10 very important to look at consolidating the guidance
11 into a single document.
12 MR. HODGKINS: Thank you.
13 Ralph? Michael?
14 MR. BOYD: Okay. Mike Boyd, EPA.
15 This is a comment that applies probably
16 more to Part 20 and Part 190, our Part 190 as well,
17 but in addition to the comments Ralph made, we are
18 also tied in part to the ICRP's schedule of updating
19 their ICRP Publication 68 and 71, particularly 68, I
20 would think, for worker dose conversion.
21 And that does become an issue for both of
22 our agencies. I think you heard Brian mention in a
23 comment yesterday that we even have on the table
24 updating Part 190 to an ICRP 60-base dosimetry as a
25 contingency, if the ICRP doesn't get us the

information we need timely.

And this raises another question to me about, when are the Europeans and Asians going to move from their recently-enacted ICRP 60-based programs to ICRP 103? And do we run a risk -- I hope not -- but do we run a risk of being ahead of them, instead of behind them by 20 years?

MR. HODGKINS: Thank you.

Okay, can we take from the microphone, microphone 2, at this point, comments?

MR. BLAND: Yes, Stewart Bland with Chesapeake Nuclear Services.

There is a certain aspect of Appendix I I think you need to look at relative to backfit and nuclear licensing, which is Appendix I is predominantly a design basis licensing tool. And built within Appendix I are requirements to implement technical specifications to ensure a certain compliance of a level of ALARA.

But if you really look at it, I think you can separate those two from a certain evaluation. You can do a design basis evaluation and Appendix I rule that could consider updating dose dosimetry and the new dose factors and such.

But, then, a lot of the implementation

1 also is tied up in the Regulatory Guides. And I think
2 what we point at is the Regulatory Guides can be
3 revised, changed, updated. You really don't need a
4 rule change to do a lot of that.
5 There's a lot of flexibility that can be
6 built into that process of a staff implementation of
7 the Appendix I requirements for applicable tech specs
8 and the environmental monitoring program that you can
9 kind of look at separately again. And you can almost
10 do an equivalency-type evaluation where you could
11 update Appendix I, incorporate the new effective dose
12 concept, and also show an equivalency from an
13 operating plant standpoint that current methodologies
14 provide an adequate level of compliance.
15 There's a lot of evaluations that need to
16 go into that, but it is a concept that I would
17 recommend that the staff explore, that there are
18 really two phases of Appendix I. One is that which is
19 done at the design basis as a licensing tool, and then
20 the second element, which is then the technical
21 specifications, which then provide a continued
22 assessment program to ensure that efforts are
23 maintained to keep releases ALARA.
24 MR. HODGKINS: Thank you.
25 Don?

1 DR. COOL: Donald Cook, NRC staff.

2 A moment ago, Mike Boyd asked a question,
3 which is actually a very good question: what are our
4 counterparts in some of the other countries doing in
5 terms of these updates?

6 And the first piece of information which
7 is quite interesting is that I have been told that
8 they have a different legal threshold for the
9 application of a number of these dose coefficients.
10 Specifically, what I understand IAEA is going to do,
11 the International Atomic Energy Agency, and I think
12 the European Commission, is they are simply going to
13 state that the most recently-published dose
14 coefficients available from the ICRP are to be used,
15 and that they plan, in fact, to buy from the ICRP the
16 rights to reproduce those when they become available.

17 So, unlike the United States where we have
18 to go through an administrative process of notice and
19 comment, irrespective of whether it's a Regulatory
20 Guide or the regulation itself, they believe that they
21 can simply legally say, use whatever is available. So
22 that they would move forward with their revision using
23 the existing dose coefficients from ICRP today,
24 Publication 68 and 72, and then when ICRP puts out
25 each of the sets of dose coefficients as it goes

1 through its revision process, those would become
2 applied when they became available.
3 So, it is a slightly different process,
4 leads you to some different ramifications, because
5 then you have a mixture over time, and you have to
6 keep track of what documents are available, but it
7 actually puts the onus on keeping track of what
8 somebody else produces, unlike here in the United
9 States where it has to be clearly noticed and
10 commented as available.
11 The other thing, the second item that I
12 would like to put out here on the table -- and I'm not
13 sure that we have clearly sort of talked about it, but
14 let me just suggest it for people to think about. One
15 component of doing all of the guidance and the updates
16 is the work on the codes that do the calculations.
17 And it's pretty clear what the methodology is. That
18 is already pretty well known.
19 And, in fact, I would suggest that one
20 possibility is, once there is a policy decision to
21 move in a particular direction, that work on codes
22 that implement the methodology and update, and
23 starting to do the verification and validation, other
24 things could move forward, and dose coefficients that
25 have been updated and gone through a comment process

1 could be dropped in later, if you will, if someone
2 much smarter than I were doing the programming such
3 that it wasn't hardwired into the software as much of
4 it is today.
5 Thank you.
6 MR. HODGKINS: Thank you, Don.
7 The next person on microphone 1.
8 MR. WRIGHT: This is Tim Wright with Duke
9 Energy.
10 I would like to address Question 2-1 first
11 about whether it be voluntary or mandatory. We
12 absolutely have to end up with everybody being on the
13 same page with this one. If we don't, one of the
14 unintended consequences is going to be from the INPO
15 world and the ANI world you are going to end up with a
16 best practice. And once you end up with a best
17 practice, if you're not one of those people that's
18 doing the best practice, once you enter the litigation
19 world, you just handed the lawyers a golden egg. So
20 we have to end up on the same page when it is all said
21 and done.
22 The other statement that I would like to
23 make about it is the question of the implementation
24 window. It is true in 1990 we had a longer
25 implementation window because we felt like we needed

1 to get people up-to-speed. But the other part of
2 that, in 1990, our staffs were about twice the size
3 they are today. So, in today's environment, it is
4 very difficult for me to take one of my staff people
5 completely out of the day-to-day work and go just work
6 on this. Because when I do that, there's two or three
7 other programs that they manage that now I have to get
8 somebody else on my staff to manage.
9 I'm not a real popular person when I do
10 that to people. I've had to do it, but I don't like
11 to do it. So I would prefer a longer lead-in period,
12 so that we don't have to just completely dump
13 somebody, and somebody else has to pick up their work
14 for the whole time.
15 That's all I've got.
16 MR. HODGKINS: Thank you.
17 From the microphones, any panelists want
18 to react to or talk to those issues?
19 (No response.)
20 And it's back to microphone 1.
21 MR. DAVIDSON: Yes, hi. It's Scott
22 Davidson, New World Environmental.
23 The best practice, does it mean the best
24 science, and are we going to then wind up having, in
25 the case of the nuclear plants, having to go beyond

1 where you leave off if you get to another iteration of
2 an ICRP? Or are we just going to stay with this is
3 what the regulation is?
4 So, to continue with best practices, you
5 need to then say we're going to do the best science,
6 and we clearly lag in that. So I don't know how they
7 reconcile that in the INPO mindset. Or maybe the
8 nuclear plant people can answer how best practice is
9 capped.
10 MR. HODGKINS: Okay. Anybody from the
11 panel want to talk to that, address that issue? This
12 is just for comment.
13 (No response.)
14 Okay. Yes?
15 MR. WRIGHT: This is Tim Wright with Duke
16 Energy. I will be glad to take a stab at what best
17 practice from the INPO world is.
18 And what we have seen so far, best
19 practices is whoever the utility loanees at INPO are
20 at the time. So, this year it may be Duke Power. It
21 may be Southern Company. It may be Exelon. That best
22 practice is a moving target, unfortunately, but that
23 is the world we live in.
24 MR. HODGKINS: Okay. Ed?
25 MR. ROACH: This is Ed Roach with the NRC.

1 In a previous life, I was exposed to the
2 INPO assessment process. In general, what you find is
3 that the NRC regulations set the minimum standards for
4 being adequate or meeting the regulations, and that
5 INPO's charter was to drive to excellence performance
6 at the plants.
7 So, where there might be variability in
8 various assessors, they do have some standards that
9 are captured in manuals to look at certain things to
10 drive the whole utility industry to a higher level of
11 performance.
12 MS. ELLEN ANDERSEN: Ellen Andersen from
13 the Nuclear Energy Institute.
14 For your information, in the radiation
15 protection area, INPO is actually working with the
16 utilities to establish industry best practices for
17 specific issues. So that is actually being led by a
18 representative from Exelon. They have actually
19 identified certain issues and have gone out there and
20 have determined what those best practices are, based
21 on risk, based on -- there's a couple of different
22 issues, criteria.
23 But it's changing. It's no longer what
24 the person at INPO thinks it is. It is what the
25 industry believes industry best practices are.

1 MR. HODGKINS: Thank you.
2 Okay, any other comments then?
3 (No response.)
4 I think we are going to go on to Question
5 No. 3 or option No. 3 and discussion of that.
6 MR. DEHMEL: Jean-Claude Dehmel, NRC.
7 Option No. 3 addresses itself now to the
8 guidance. Essentially, we're kind of looking at the
9 guidance document, namely, the number of
10 radionuclides, the Reg Guides, the computer codes, and
11 the SRP in this particular in this particular context.
12 So, how would we, in essence, implement
13 whatever Part 20 did with ICRP 103, how we would
14 essentially import this into the guidance associated
15 with Part 50, Appendix I.
16 So there are three options: limited scope
17 option, expanded scope, and a full-blown revision of
18 all of the guidance, all the computer codes. So let's
19 take those one at a time.
20 Limited scope revision would be kind of a
21 surgical update of the guidance as well as the
22 computer codes, meaning that we would identify the
23 dose conversion factors that would need to be revised
24 and slipped into the new libraries and a tabulation.
25 The dose computation methodology would be different,

1 obviously. So, those algorithms and subroutines would
2 have to be changed. And stop at that.
3 In essence, we would limit the revision to
4 the guidance and the computer codes to only strictly
5 the dose conversion factors and the calculation
6 methodology, and leave everything else. So, that
7 means that the implication of that is that we would
8 revise, obviously, the conversion factors, but
9 everything else that essentially is equally important
10 to the dose, for example, usage factor, default
11 assumptions in the Reg Guides, and so on, intact as
12 they were.
13 So, we would be coupling state-of-the-art
14 information on dose and dose computation or
15 methodology with older assumptions and parameters that
16 are still 20, 30, 40 years beyond the times, as it is
17 documented in the Reg Guides as well as the computer
18 codes, the NUREGs that support the two computer codes,
19 the LADTAP and the GASPAR.
20 Option 3b would, in addition to the above,
21 say we would look at, obviously, revise again and
22 import all the dose conversion factors, but, then, we
23 would look at the next tier of parameters, assumptions
24 that are equally important to dose, such as usage
25 factors, for example, and revise those as well.

1 The implication here is that we would look
2 at all of these parameters, revise them, all the dose
3 conversion factors again, updating with current state-
4 of-the-art information, or whatever is available in
5 the literature, and then leave intact the basic
6 models, the basic model having to do with, for
7 example, dispersion, aquatic dispersion. All of that
8 would remain unchanged.
9 The same thing with environmental
10 transport models that are described in Reg Guide
11 1.109. Those models would be unchanged.
12 MR. HODGKINS: Do you want to go on to 3c?
13 MR. DEHMEL: Yes.
14 MR. HODGKINS: Okay.
15 MR. DEHMEL: And this, 3c, is a full-scope
16 revision. In essence, what we would do, this would be
17 a bottom-up, a top-down review of everything. Not
18 only we would obviously import all the appropriate
19 dose conversion factors, we would revise the
20 calculation methodology, the subroutines, the
21 equations, everything. We would look at all of the
22 default parameters that are currently built into the
23 code, all of the assumptions that are identified in
24 the several tables at the end of Reg Guide 1.109.
25 Then, we would go beyond that. We would

1 look at all the dispersion models. We would look at
2 environmental transport models that are described in
3 Reg Guide 1.109. We would look at the aquatic
4 dispersion model and the airborne transport model.
5 So, that would be, obviously, a large effort.
6 So, in essence, this is essentially saying
7 Reg Guide 1.109 and the two associated computer codes,
8 as well as the chi over q computer code. The water
9 transport model would be literally set aside, and we
10 would spend all this time and effort to update
11 everything.
12 So, the implications here, obviously, are
13 on all of these, as you can see, the first option is
14 perhaps the quickest that could be implemented. The
15 second option is kind of a midpoint, where it involves
16 a little bit more complexity, but it would take least
17 amount of time. And option 3c would be quite
18 extensive because we would talk about, at this point,
19 reviewing and revising all the models and having to
20 not only revise the model, but also justify the models
21 with respect to doing verification, defending the new
22 models, subroutines that may be identified, developing
23 a whole new guidance document supporting the
24 assumptions, supporting the new environmental
25 transport model, if there were such differences

compared to the existing one. So that would be a huge, huge effort, as you can imagine.

So I would like to pass it around the panel members to kind of discuss the merits of these three options.

MR. HODGKINS: Okay. And does anybody want to start the discussion as far as the panelists to begin with or should we just go around the table again? Who's brave enough? Ralph always starts, guys. And that works well.

Ralph, would you mind starting the conversation for everybody? You are a favorite today.

MR. ANDERSEN: Ralph Andersen, Nuclear Energy Institute.

I guess my response would be that, in the ideal, given that this is probably a once-in-a-generation opportunity for the resources to be focused on this issue, that 3c would be the preferred option.

You know, my own observation over the last 20 years of being an NRC-watcher is that issues come and go, and once they have come and gone, then it is very, very, very difficult to get the priority and budget and resources to go back and do additional things.

That certainly was the case after the

1 major revision to Part 20 previously. So, here we are
2 20 years later sort of reorganizing the resources to
3 take this on again. So, as much as can be done and
4 updated in the context of this current process, in my
5 mind, would be preferable.
6 That being said, there is also the realism
7 of whether there is sufficient opportunity for getting
8 the budget and resources to do 3c, and I don't have
9 any sense for that, Jean-Claude. It may be that the
10 scale of that effort simply exceeds what you could
11 possibly hope for for downstream budgeting, especially
12 if you keep living on Continuing Resolutions. So,
13 some realism needs to come into play for that.
14 So, for an informed answer to that, in our
15 written comments, it might be helpful if we were to
16 gain a better understanding from an NRC resource point
17 of view as to what the relative size of those efforts
18 are from your perspective. Is 3c 50 times larger than
19 3b? I don't have a good sense for that, of what it
20 looks like in terms of all the necessary work that
21 would have to be done.
22 MR. HODGKINS: Thanks, Ralph.
23 MR. SMITH: William Smith with Southern
24 Nuclear Company.
25 I would think another consideration would

be the particular Reg Guide that you are looking at to change. Whereas, the 1.109 you might be able to do some expanded scope revision and accomplish what you need within the timeframe that you need it, but another Reg Guide, 1.110, that also supports this, may need a total rewrite and update to the technology.

So I would think it would depend on which Reg Guide you're attacking and, also, the timeline you are trying to meet, so that they are available when they are needed.

MR. HODGKINS: Roger, pass? Brian?

MR. LITTLETON: This is Brian Littleton with the EPA.

I don't think the agency really has a strong preference here, with one exception. And that exception is that we do rely upon some of, I guess some of the science and the technical data that the NRC generates as far as parameter inputs, et cetera, to different models and codes. So we are probably predisposed that we would like to see, if the money is available -- I don't think the agency is going to have the money to do the studies -- but, if the money is available, we probably would like to have some of that data developed.

I will provide a third, I guess, different

1 twist to option 3b. That is that this is something
2 that we kind of think about when we think about
3 whether to revise certain portions of our standards or
4 not. That is maybe doing a sensitivity analysis on
5 those aspects of, let's say, the standards which are
6 going to have the major impact, and then just
7 considering those in the revision, as opposed with
8 just a wholesale change everything, which you may not
9 have the money or the time to be able to handle.
10 MR. HODGKINS: Thank you, Brian.
11 Larry?
12 MR. HAYNES: As a health physicist, my gut
13 is let's get the best science possible into our
14 processes. From that perspective, I would like to see
15 the full-blown effort. I know that that is a long-
16 term issue and would take a significant amount of
17 work.
18 And from a benefits standpoint, I can see
19 that a lot of this research and work would be done in
20 universities, other organizations. So, that is an
21 opportunity to bring new folks that are going to staff
22 our plants in the future, they would bring that
23 knowledge with them. So there's some advantage to
24 that from that perspective.
25 It also, though, has to do a lot with,

1 what's the implementation period, and are these
2 things, can they be basically planned out in a project
3 plan where maybe 3b is the target method or plan, but
4 the pieces that plug into that to turn 3c into the
5 ultimate product would maybe come later. So, if a
6 plan is built around it, maybe you can do it in pieces
7 and implement in the timeframe we would like to, but
8 still build into the back-end the final product.
9 MR. BOYD: Mike Boyd, EPA.
10 I, like most of the people that have
11 spoken so far, find the good science/new science
12 attractive. I think, though, that in my experience a
13 lot of times the old science, the old models, the old
14 compliance models in particular, were intentionally
15 quite conservative. So there is an option where you
16 could let the licensee, if it were to his or her
17 advantage, develop a more complex, a more elegant
18 model that was less conservative, so to speak, but
19 more accurate, if it became an issue of demonstrating
20 compliance.
21 So, sometimes the old things, because they
22 were intentionally conservative, were completely
23 adequate. So I don't know.
24 I did have one other comment, and that
25 was, listening to Frank and Larry this morning, I

1 found myself being persuaded a little bit that maybe
2 there is an attractive option of putting operational
3 quantities in Part 20 and making 50 just design
4 objectives. I thought that was a good idea.
5 MR. HODGKINS: Thank you.
6 Pass?
7 Jean-Claude, do you want to add anything
8 to the discussion?
9 MR. DEHMEL: Yes. Jean-Claude Dehmel,
10 NRC.
11 A couple of comments, and those are
12 essentially staff's observation as to what we are
13 thinking about the guidance, the Regulatory Guides and
14 the NUREG. Let me kind of outline to you what the
15 staff is thinking at this point.
16 It is that we would take the NUREGs that
17 support all this, NUREG 1301, 1302, NUREG 0133, and
18 NUREG 0543, which is compliance with the 40 CFR 190
19 aspect of Part 20. That would be collapsed into one
20 single document, one single NUREG.
21 The implication of Generic Letter 8901 is
22 not clear yet whether or not we could revise the
23 Generic Letter, or would we have to issue a new one?
24 I don't know. This is kind of a policy issue, and
25 someone else will have to make that determination.

1 But because Generic Letter 8901 pieces out
2 what used to be, in effect, specs before and
3 apportions it to the operational program and NUREG
4 1301, 1302, so a determination would have to be made
5 as to what retains in a tech spec per se, what the
6 prior tech specs are, capture the operational program
7 of the tech spec, and what should be retained in the
8 revised 1301, 1302 NUREG as one single document.
9 Reg Guide 1.109 would be revised, and it
10 would stand alone. The same thing with Reg Guide
11 1.111 and .113. 1.110, on a cost/benefit analysis, is
12 going to be revised.
13 And what we did not mention earlier is
14 there is an effort, as we speak, within NRR to revise
15 the cost/benefit ratio. So, this would be done before
16 we even start this effort.
17 So, by the time we are ready to go --
18 ultimately, you have an announced proposed rulemaking.
19 At that point, we will be able to describe and
20 discuss how the revised cost/benefit ratio and how
21 they are going to be implemented. That is something
22 we don't know yet, whether or not it is going to be
23 implemented as a SECY paper or a new NUREG 1530 that
24 would supplement, supersede the 1995 version that
25 introduces the $2,000 per person. We don't know that

1 yet.

2 But that is going to be imported into the

3 revised Appendix I. So we would essentially piggyback

4 that portion of the revision in Section 2(d) of

5 Appendix I. The Reg Guide would be revised,

6 obviously, at the same time.

7 In the next SECY paper that you will see

8 in October of 2011, there is a discussion about the

9 implication of revising the technologies and some of

10 the costs information that is described in the Reg

11 Guide 1.110 having to do with labor cost, equipment

12 cost, maintenance cost, and also revising the list of

13 technologies that are described in that Reg Guide.

14 There are other technologies that are used

15 in new reactor applications that are not listed in Reg

16 Guide 1.110. Some of the sizing of the equipment in

17 Reg Guide 1.110 is undersized compared to what we are

18 seeing currently with the new reactor applications.

19 So we would do that scrubbing as well and revise that.

20 MR. HODGKINS: Did you want to say

21 something now on mic 2?

22 MR. BLAND: Stewart Bland with Chesapeake

23 Nuclear Services.

24 Jean-Claude, I think you got a good handle

25 and a good scope on it. I commend you on the

1 comprehensiveness of looking at it.

2 If I look back, though, also at the

3 modeling, the modeling that was done back in the early

4 seventies, and I was with the Commission at that time,

5 you will recognize that there are really some

6 compromises in that modeling of Reg Guide 1.109 and

7 the meteorological modeling that were done that really

8 don't reflect good science and good applications and

9 the current knowledge base.

10 You have certain assumptions that were

11 made relative to radioiodine partitioning coefficients

12 between element and methyl iodide-type methods which

13 dictated, then, deposition parameters. We are a

14 little bit smarter on some of those kinds of items.

15 You reflect in meteorology that

16 compromises and changes were made during the

17 implementation stage that incorporated this concept of

18 a mixed mode type meteorological release, which,

19 basically, in my opinion is fundamentally wrong. It

20 was a fit. It was a fit of the science at the time in

21 order to recognize different types of conditions.

22 But if you go plug that into modeling and

23 the use of certain dose parameters and such, you have

24 got a mix of models. It really just doesn't fit.

25 So there is really a need, if you really

1 are looking at trying to improve your assessments and
2 modeling techniques and methodology, there is a need
3 to update the guidance on how to do it.
4 A lot of that, though, I will say, and I
5 still contend, is separate from an Appendix I rule.
6 Those are staff implementation-type guides, and they
7 don't necessarily have to be linked together. There
8 is some separation you can do between a rulemaking for
9 Appendix I, and those guides, then, reflect an
10 implementation-type method. They are quite
11 fundamental.
12 But if you look at what the staff did back
13 in the seventies or so, they came out with an Appendix
14 I rule and then it was, oh, my gosh, how do we
15 implement it? And all of the implementation came
16 after the rule, and that's where you got into
17 developing certain modeling assumptions which were
18 effective for implementing the rule at the time.
19 So there's definitely a need to look at
20 improved modeling, but, at the same time, in terms of
21 an implementation of Appendix I and from the power
22 plant standpoint, we are so far below those from an
23 implementation, I will go back to I think that the
24 power plant industry is a self-regulation industry.
25 And to allow that kind of flexibility, to let it

1 continue in a self-regulation industry is
2 advantageous, and simplifying what would be
3 requirements of Appendix I.
4 MR. DEHMEL: Yes, with respect to what you
5 noted, and I'm going to touch on that later on when we
6 talk about issue 4. But this has to do with,
7 ultimately, how the Appendix I criteria are revised
8 with respect to their underlying dosimetry basis. But
9 we would have to revisit table 1 of Reg Guide 1.109,
10 which touches upon the doses and the models associated
11 with complying with that particular criteria.
12 Obviously, table 1 directs the user to
13 specific models and specific equations and specific
14 dispersion models. So that would be touched upon.
15 I understand that the two, in essence,
16 could be conducted independently. It's true that you
17 could take Reg Guide 1.109 and ignore for a moment
18 what the numerical criteria of Appendix I are and
19 march through the process and revise the Reg Guide,
20 with the introduction to the Reg Guide and the
21 regulatory position to be, in essence, addressed
22 later. And then you could march through the process.
23 You could do that, essentially, to all of
24 the Reg Guides. But, as a matter of policy -- and Don
25 may want to speak to this -- I don't know whether or

1 not we could initiate that effort without essentially
2 that effort being tied to some sort of rulemaking
3 process or policy decision.
4 So, I understand that, because of the
5 policy constraints that the NRC has, the way the
6 process is set up, I don't know whether or not we
7 could essentially start revising the Reg Guide next
8 year, for that matter, and working on these pieces.
9 Because it's true, you could actually take over that,
10 forget the introduction for a moment and the
11 regulatory position, and actually address all of the
12 models; everything could be actually put into place
13 before.
14 And the only thing you need to do at the
15 end is make reference to ICRP 103 or ICRP 20, 60, and
16 30, and slip in the right dose conversion factor
17 tables at the end. That could be done that way.
18 But I don't know whether or not we can
19 actually proceed on that basis, essentially flip the
20 process around, start with the Reg Guide without
21 having some sort of a driver, which would be a
22 regulatory policy.
23 Don, do you want to talk about that?
24 MR. HODGKINS: You know what? Before Don,
25 just let me, because we did have a webinar person, and

1 it might be cogent to what you guys are discussing.
2 Let's see.
3 This is from Cindy Bloom.
4 "While a step-wise approach might seem
5 more comfortable as one tries to morph a program, if
6 there are going to be many programmatic changes that
7 are all influencing each other, it would certainly be
8 more efficient in terms of time, money, and the
9 ability to learn and train to do it all at once with
10 time provided for implementation."
11 Thank you, Cindy.
12 Don?
13 DR. COOL: Donald Cool, NRC staff.
14 Jean-Claude is correct that we have to
15 have some decisions before it would be reasonable and
16 appropriate to go off and expend NRC resources on an
17 effort to start revising guidance, update models,
18 review underlying models, parameters, and otherwise.
19 Part of what we are, in fact, trying to do
20 today is to understand from the stakeholders, which
21 very flatly some of you are fee payers as well -- we
22 are a fee recovery system -- if it is viewed by the
23 stakeholders that, once a directional decision is made
24 to move in a direction that moves towards aligning the
25 models, even though that needed to go through the

1 rulemaking process, and though the particular details
2 of a regulation would still be uncertain, whether the
3 stakeholders would wish, because of the timing,
4 because of the desire to have an updated and
5 consistent science, that the stakeholders view that it
6 would want the NRC to also start to move the guidance
7 development in parallel, somewhat anticipatory of an
8 end-state, but having made a directional decision.
9 Because, in fact, much of what the NRC
10 staff will do in going to the Commission next year on
11 the policy is seek direction to move forward in
12 regulation. And one of the things the staff could
13 suggest to the Commission is that, in moving forward
14 with that direction, if the Commission agrees, that
15 the staff would, then, look to find budget and start
16 to expend the resources in parallel, so that the
17 guidance would be ready in a more timely manner, and
18 that it didn't have to be in series.
19 So, what you are putting on the record and
20 the viewpoint that you give to us will help us make
21 some of those decisions.
22 MR. HODGKINS: Thank you.
23 Any reaction from the panel again?
24 (No response.)
25 Were you wanting to make a comment on

1 microphone 1?

2 MR. DAVIDSON: Hi. This is Scott

3 Davidson, New World Environmental.

4 No, the whole idea of taking out dose from

5 Reg Guide 1.109 makes a lot of sense. You are looking

6 at what the effluent means to a receptor in terms of

7 some intake or something like that. Then, you can let

8 the science of dosimetry take on from the point of

9 where the person is exposed. And that can be separate

10 as a science thing. Whereas, the .109 could be:

11 here's how it gets to that person.

12 MR. HODGKINS: Excellent.

13 Any other reactions from our -- yes,

14 Michael?

15 MR. BOYD: This is Mike Boyd, EPA.

16 As I have done a little more thinking

17 about this, I am wondering, Jean-Claude, if it really

18 is that big an effort. Because across the federal

19 agencies there are a lot of models that are

20 continually being updated. I think, in part, the

21 RESRAD family of codes that DOE has and other similar

22 codes, where a group of scientists at Argonne, for

23 example, are always keeping abreast of the latest

24 parameter values, and couldn't we perhaps just

25 validate and incorporate existing state-of-the-art

1 codes?

2 MR. DEHMEL: Yes, we realize that. The

3 same thing with the environmental models, we realize

4 that. All of the transfer parameters and some of the

5 consumption and usage factors that are already

6 documented in Reg Guide 1.109, we realize

7 bioaccumulation factors for that for that matter as

8 well.

9 We realize that there is a lot of

10 information available in the open literature right

11 now. The thing is that, at this point in time, to

12 actually scrub through all this and try to identify

13 what is relevant, what is useful, and then benchmark

14 that against typical power plant releases, and see

15 whether or not, you know, does it work all the time?

16 So there is a huge effort with the

17 applicability, the review of the information, the

18 validation and verification of the revised

19 subroutines, developing whole new computer codes. So

20 I understand that there is information that could be

21 quickly gleaned from the public sector and DOE labs

22 and other federal facilities.

23 The problem that I see or the challenge

24 that I see for the staff is to actually sort all this

25 information out, assemble it into a new model, and

1 essentially making sure that it does work, validate
2 that, benchmark it, and then go out again for public
3 comments and get input from everybody, doing
4 sensitivity analysis, and so on.
5 So, the issue here is that this is a huge
6 effort. We have heard from Argonne National Lab,
7 which is interested in doing Monte Carlo-like
8 analysis, so they are thinking, well, why don't you
9 apply Monte Carlo-like analysis the way it is done in
10 a RESRAD family of computer code and plug that
11 concept, apply that concept for effluent releases.
12 So you would have, essentially, a
13 distribution of what the dose might be, and then we
14 would pick, you know, 90 to 95th percentile output.
15 So, I thought, well, that may be okay for a safety
16 application, but it is not a safety standard. And the
17 question is, should we go in a Monte Carlo-like
18 analysis for all effluent releases?
19 So, the other problem with that I see, and
20 I have used RESRAD a lot when I was in the
21 decommissioning group, is that you would have analysis
22 that would literally take hours on a computer, and
23 those models are very complex here. We are talking
24 about 20, 30, 40 radionuclides. So there would be
25 some implication as to how long it would take, the

complexity of the models, how long it would take to generate the releases.

And then, you have the problem, not the problem, but the reality, when you have a computer model output that uses Monte Carlo techniques, the peaks of the doses occur at different times. So, what do you do with these peaks? Do you use some of the peaks? And they also represent a different timeframe at which they occur in the environment.

So there is an advantage for doing this, but we are, then, at this point piling up a huge layer of complexity, that even though that would be the best science literally, but there is an implementation aspect and there is a development aspect for the staff to develop these kinds of computer codes.

So, I mean, the health physics staff may have a position, but there are other factors, other filters that would have to be imposed on this and filtered through to determine whether or not is this what the agency wants to do and, most importantly, the amount of resources that will be available. That is really the key issue.

MR. HODGKINS: Thank you.

Yes, Michael?

MR. BOYD: Just as a quick followup, I was

1 actually thinking about deterministic models and not
2 Monte Carlo.
3 MR. HODGKINS: Okay. Any other
4 clarification?
5 MR. PEDERSEN: Yes, I do have a comment.
6 I would suggest that the scope of the
7 supporting documents and guidance that could be put
8 into place is somewhat dependent on what the change
9 would look like, particularly whether it was a
10 voluntary or mandatory change to Appendix I.
11 If it was, in fact, a mandatory and we
12 were providing additional guidance, we could probably
13 be more comprehensive in the changing of all those
14 parameters that were mentioned that are currently
15 built into the design basis of the current operating
16 plants.
17 You know, from a practical standpoint, it
18 would be easier to do that than to try to determine
19 what all of those changes, what kind of an impact that
20 would have for the actual operating plants, just from
21 a practical standpoint.
22 MR. HODGKINS: Any other comments?
23 Questions?
24 (No response.)
25 It is now time for lunch. So, what we are

1 going to do is save the questions for after lunch. It
2 is 12:02. We are asking that you come back into the
3 room at 1:02.
4 And for those folks who are on the
5 webinar, we will be taking an hour break. Please come
6 on back into the room, then, at 1:02.
7 We appreciate it.
8 And lunch is on your own.
9 (Whereupon, the foregoing matter went off
10 the record for lunch at 12:03 p.m. and went back on
11 the record at 1:08 p.m.)
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2 A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

3 1:08 p.m.

4 MR. HODGKINS: For the webinar

5 participants, there are cookies and cupcakes that the

6 local participants, I can't pull them away from the

7 table. So we are having some difficulty here.

8 Come on, Don, get that cookie out of your

9 hand.

10 (Laughter.)

11 All right, terrific.

12 What we will do is we are going to finish

13 up. We will do a little recap and then go on through.

14 There are four areas, and then the fifth one is just

15 going to be open discussion, in case there is an

16 opportunity that has been missed or a clarification

17 point that you want to make.

18 So, for the webinar participants, please

19 feel free to write your questions down. As a

20 reminder, we will not be able to do the audio. It's

21 only the written question, and we will read those

22 outloud as best we can here, as part of the audience

23 participation.

24 With that, I am going to turn it back over

25 to Jean-Claude.

1 MR. DEHMEL: Dan, thank you.

2 Jean-Claude Dehmel, NRC.

3 Just kind of a quick recap, before lunch,
4 just in case we had short-term amnesia, the thing we
5 were talking about was the scope of the revisions. So
6 we talked about this before lunch: limited scope,
7 expanded scope, and full scope. And we had a number
8 of point stories and questions and discussions.

9 And I believe that, as part of the
10 discussion and option discussion that we had before
11 lunch, we, in part, addressed most, if not all, of
12 Question 3-1.

13 I just want to make sure, is there
14 anything else that somebody may have thought about
15 over lunch that perhaps it should be worthwhile noting
16 before we got to Questions 3-2 and 3-3?

17 (No response.)

18 MR. HODGKINS: Let's move on.

19 MR. DEHMEL: Nothing. So I will proceed
20 to Question 3-2.

21 So, this has to do with the impacts and
22 benefits on the implementation of the revised Part 50,
23 Appendix I. We have heard this morning points being
24 raised about, what are the implications, and so on?
25 And obviously, there are some benefits associated with

1 that.

2 And Ralph Andersen brought up a few

3 points. But the thought was that perhaps in our

4 discussion and perhaps in a SECY paper, 08-01-97, that

5 maybe the benefit aspects was not fully aired out or

6 there wasn't enough amplification on the benefit side.

7 And the next question has to do with, if

8 there are significant impacts with respect to the

9 implementation, how should the NRC address this in its

10 next policy paper?

11 So, what I would like to do is,

12 essentially, kind of toggle between Question 3-2 and

13 3-3, having to do with identifying what are the

14 impacts and the benefits, and then the next step is

15 perhaps ranking those and perhaps considering those

16 that are really significant and the NRC should

17 consider in a next step, that is, preparing policy

18 attachment to the SECY paper and identifying some of

19 those impacts, benefits, and those that have

20 significant regulatory implication that we should be

21 aware of and we should identify in the next SECY

22 paper.

23 So, I am going to leave it open for

24 discussion.

25 MR. HODGKINS: Okay, let's try a round

1 robin. Again, as far as Carolyn, any comments?

2 MS. HILL: No.

3 MR. HODGKINS: Okay. Edward?

4 MR. ROACH: This is Ed Roach, Health

5 Physics, New Reactors.

6 And I think, again, we said this, and

7 Ralph was the one who stated it. The benefits,

8 clearly, and the significant impacts are -- the

9 benefits are the public perception, getting us up

10 aligned with the international community as well as

11 the most recent good science, and the most impacts

12 will fall on the licensees with the cost of revising

13 those programs.

14 I think our challenge is to quantify what

15 that cost is and the perceived benefit, so that we can

16 do a fair presentation to the Commission.

17 MR. HODGKINS: Thank you, Ed.

18 Michael? Nothing to add? Larry?

19 MR. HAYNES: No.

20 MR. HODGKINS: Nothing to add? Brian?

21 Roger?

22 MR. PEDERSEN: I was actually looking

23 around for Dr. Meck. Earlier he kind of addressed

24 this in terms of what he termed intangible benefits.

25 So, I think we need to take that as a significant

1 takeaway, that maybe in discussing the benefits in the
2 next SECY paper we have a section that we don't try to
3 quantify, but we maybe amplify.
4 I think the list that Dr. Meck mentioned
5 was the status of the U.S. in the field.
6 Ah, there he is. Were your ears burning
7 because I'm talking about you? I'm speaking for you
8 about public confidence and international alignment
9 with technical practices. I am reiterating the list
10 of intangible benefits that you had mentioned earlier,
11 since we are talking about trying to identify what the
12 potential benefits are.
13 In addition to that, we might want to try
14 to stratify things out on short-term benefits and
15 long-term benefits, things that would have the most
16 immediate impact, even things that would have a
17 longer-term impact. And I don't have a good list of
18 those right now, but that's my input.
19 MR. HODGKINS: Okay. William, any
20 comments to add to that discussion?
21 MR. SMITH: I thought about one benefit,
22 and that only fits one of the objectives. That is to
23 have the federal agencies consistent with some of the
24 limits related to other changes.
25 MR. HODGKINS: Thank you.

1 Ralph, anything to add?

2 Yes, there's one in front of you, too,
3 Ralph (referring to the microphone). I think they are
4 giving you your own.

5 (Laughter.)

6 MR. ANDERSEN: Ralph Andersen, Nuclear
7 Energy Institute.

8 The one potential benefit that could be
9 created that I can think of that we haven't touched
10 on, although Scott Davidson made some comments that I
11 think go to that, that would be to reform the
12 regulation itself in a way, both in what's in the rule
13 and what might be in guidance, to make it much easier
14 in the future to consider and adopt updates to the
15 science. In other words, to facilitate future
16 changes.

17 The phrase has been used several times
18 about a living regulation. In my mind, a living
19 regulation is one that doesn't prescribe the
20 methodologies, and so forth, even by implication, in
21 terms of the criteria that are assigned. So that
22 might be one possibility, too, is look at how you
23 might be able to reshape the regulations.

24 So that, for instance, the issue of
25 cost/benefit that you and I have talked back and forth

1 about over a considerable amount of time, you know,
2 right now, as we used to talk about, it requires a
3 rule change to address changes in that, even where the
4 agency has changed its policy in other areas. That
5 might be an example of details that might be better
6 captured in guidance or other documents, so that the
7 rule can remain intact, where you could address
8 changes and things like that.
9 That could be a very tangible benefit from
10 the regulator's side. Because you are still going to
11 use public comment, and so forth. I mean there's
12 still a public process to monitor those kinds of
13 changes. But, to always have to go to a rulemaking to
14 address any emergent issue, I think you could avoid
15 that by the way you restructure the rule.
16 MR. DEHMEL: Jean-Claude Dehmel, NRC.
17 A couple of things. One, if you look at
18 enclosure 3 of SECY 08-01-97, there are two
19 punchlists. So take a look at those as what we
20 already have addressed/identified. So, just in your
21 comments by January 31st, give us a delta. If there
22 are certain things that are not listed in there that
23 you think are important, then please augment that
24 tabulation that is in enclosure 3 of SECY 08-01-97.
25 With respect to the cost/benefit analysis,

1 as I mentioned earlier, NRO is in the process of
2 finalizing a new cost/benefit ratio. I believe that
3 in a prior draft of the report they were thinking
4 about a process by which there would be an automatic
5 -- or a process built into Section 2(d) of Appendix I
6 that would allow, in essence, the NRC to automatically
7 update the cost/benefit ratio to the current dollars.
8 I don't know whether or not that is going to remain
9 in a final proposal, but that is being addressed.
10 Recognizing that having to revise the cost/benefit
11 ratio involves every time a rulemaking, which may not
12 be necessary, there may be another way of doing it.
13 So, that is being considered.
14 We have identified in that punchlist in
15 enclosure 3 of the SECY paper a couple of items that
16 attempt to address the fact that you have utilities
17 with a large number of power plants and utilities with
18 one or two power plants as far as the cost/benefit and
19 the implications of changing the regulation.
20 So, I would like to spend a little bit of
21 time on that, discussing that, whether or not -- does
22 that make any difference? Would a utility with a
23 large number of power plants benefit from some economy
24 of scale in revising the procedures and the computer
25 code, as opposed to a single entity with one or two

power plants? What are the implications with that? Any thoughts?

MR. HODGKINS: Larry?

MR. HAYNES: Larry Haynes, Duke Energy.

I think the answer, obviously, is, yes, if a utility has a standardized program. If not, then it is going to be an issue.

So, for the Duke plants, we have a shared software package, and we share procedures. So, for us, it would be an economy there for doing the work. Of course, there's still the training aspects for all three sites and the technicians and the staff.

One thing we had discussed kind offline was there is an opportunity for the industry here to develop maybe a common computer program that maybe EPRI or some other entity could develop, but that we would all use. So, there may be a way that we could, if we cooperated to develop something, that the utilities just are connected to, and not have to create their own processes.

MR. HODGKINS: Thank you.

Any other comment? Ralph?

MR. ANDERSEN: Yes, a related element is you will recall -- and I can't remember; maybe Rich can answer or Roger remembers -- there was an SRM a

1 while back from the Commission that alluded to NRC
2 setting up the capability for electronic reporting for
3 effluents. And it fell short of direction. It just
4 sort of threw it out there as something that should be
5 considered. I just don't remember what the specific
6 issue is they were responding to where they threw that
7 in.
8 But that would be another opportunity, is
9 my point, for the NRC to capitalize on the fact of the
10 rulemaking, is to do something similar like you did
11 with REIRS for occupational exposure.
12 MR. CONATSER: This is Richard Conatser,
13 NRC.
14 Yes, the collection of that data, the
15 automatic collection of the data, that was related,
16 really, to submittal of the annual reports by the
17 licensees. That wasn't really for the individual
18 calculations of permits or dose calculations, or
19 anything like that. That was the annual reporting of
20 the data.
21 And that was voted down as not being
22 something we wanted to pursue because that would take
23 additional rulemaking at that time. Now, if we wanted
24 to pursue something like this, maybe we could at the
25 same try to look at that type of thing. That is

1 something, I guess that might be a good point.

2 MR. HODGKINS: Any other feedback from the

3 audience?

4 Yes, Roger? Ralph?

5 MR. ANDERSEN: To kind of close the loop

6 on that, the simple story is the globe is moving to

7 web-based data transfer. And that's the thought, is

8 that that should be something else you ought to look

9 at as a part of this rulemaking, would be changes that

10 you would actually make within the NRC above and

11 beyond just the standard updating to documents, and so

12 forth, creating things that would facilitate your

13 work, like web-based reporting, which would also

14 benefit us.

15 I would just fold some of those in because

16 that kind of thinking went into the last revision of

17 Part 20; hence, REIRS.

18 MR. DEHMEL: Thank you.

19 So this is the last issue that is

20 identified in The Federal Register notice. We are

21 going to go over these things. So, some of this

22 essentially is a recap, but there are other aspects

23 that transcend the revision of the dose conversion

24 factor, although the dosimetry basis of Part 50,

25 Appendix I, numerical guides.

1 So, the first one, 4.1, numerical design
2 objectives, we talked about this earlier. So, the
3 bottom line is this would have to be synchronized with
4 Part 20 under the current thinking that we understand
5 that we are getting some feedback here that may
6 perhaps urge us to consider another alternate avenue
7 on this. This is fine.
8 But the thinking here on 4.1 is that we
9 would synchronize it with the revision to 10 CFR Part
10 20. So, if it ICRP 103 as adopted in Part 20, that
11 would become the basis of the numerical guides for
12 Appendix I to Part 50. And again, if 103 is not
13 adopted, then this would be normalized with the
14 current Part 20 under ICRP 26 and 30. So, that's
15 fairly straightforward, I think.
16 The other elements, 4.2, 4.3, 4.4, and
17 4.5, are, in essence, beyond the primary intent of
18 this proposed rulemaking or these changes.
19 The first one, having to do with organ
20 numerical design objectives, we know that in Section
21 2(a), 2(b), and 2(c) there are criteria for total
22 body, all body, and specific organs. And the organs
23 are mainly the thyroid and the skin and other organs,
24 for example, the bone.
25 So, if we are going to move to an

1 effective dose or a total effective dose concept, one
2 line of argument is, well, we don't need to worry
3 about organ doses anymore. So, therefore, we could
4 drop those numerical guides out of Part 50, Appendix
5 I, and retain only those that are associated with the
6 whole body.
7 On the other hand, given that there is a
8 possibility of large releases of noble gases and
9 iodines, which essentially might dominate in terms of
10 organ doses and skin doses, given that possibility,
11 should we retain organ doses, but only retain them for
12 the purpose of thyroid doses and skin doses, and
13 essentially ignore all of the other organs that are
14 listed in the Reg Guide 1.109 model? So that is one
15 issue.
16 The other one, on 4.3, having to do with
17 the annual beta and gamma air doses for gaseous
18 effluents, should we retain? This is the only set of
19 criteria in Appendix I to Part 50 which is not
20 expressed in millirem per year. It's in millirem per
21 year; it's an air dose. It's an absorbed dose to the
22 air.
23 So, the question is, should that, those
24 two criteria, be retained? Should they be dropped?
25 Should they be converted to an effective dose or a TED

1 dose on the assumption that somebody is located at
2 EAB?
3 Section 4.4 has a broader licensing
4 implication. The way the Appendix I rule is written
5 and the guidance, it focuses only on lightwater
6 reactors. We are now considering applications coming
7 in for the first one most likely is going to be high
8 temperature gas-cooled reactor, and there may be some
9 other designs that are going to come; for example,
10 molten salt, molten lead, and so on. Whether or not
11 those are actually applications that we have to review
12 as design certification, I don't know at this point.
13 But I know that it looks like in 2012 we
14 are going to see design certification application for
15 a high temperature gas-cooled reactor. I realize that
16 we licensed two plants that way, Fort St. Vrain and
17 Peach Bottom, using the current Appendix I, even
18 though those are high temperature gas-cooled reactors.
19 So, should we take this opportunity at
20 this time to consider a couple of things. One is add
21 additional requirement under Part 50, Appendix I, and
22 obviously expand the guidance, to, in essence, say
23 that, as far as emission is concerned, meeting
24 Appendix I requirement is almost insensitive to the
25 kind of reactor technology, with the exception that

1 you may have a different set of radionuclides in a
2 source term, both liquid and gaseous effluents, that
3 you would expect to see if you were dealing with a
4 conventional lightwater reactor. That is one
5 approach.
6 Another approach might be to basically
7 develop a separate set of equivalent Appendix I
8 requirements for different reactor technologies. I
9 don't know what this would look like. Now, obviously,
10 this is just speculation at this point. So, we want
11 to talk about that.
12 Item 4.5, compliance with requirements for
13 licensed operation under 10 CFR Part 20, as you know,
14 Appendix I requirements are on a per-plant basis. The
15 way Part 20 is written, the concept of licensed
16 operation is per, essentially, licensed entity. And
17 that has some ramification with the implementation of
18 40 CFR 190 as it is identified in Part 20, 1301(e).
19 So, the thought here is that we would
20 propose an amendment to that part of Part 20, and
21 whether or not that amendment should be in a
22 regulation or should be expanded upon the guidance, I
23 am not really too sure. OGC would have to weigh-in on
24 this.
25 But should a distinction be made in Part

1 20 -- and let's assume at this point for the sake of
2 discussion this is a Part 20 issue, truly a Part 20
3 issue -- should we provide additional amplification in
4 Part 20 that says, if you have one site that operates
5 two reactors managed by two different entities,
6 commercial entities, meaning that each one has its own
7 docket, its own license, and they are both
8 contributing to a dose, to a single offsite dose
9 receptor, and they are competing for the same dose, in
10 this case 100 millirem or 25 millirem under 40 CFR
11 Part 190, how do we address this in revised Part 20?
12 So, we should look at that.
13 And the issue here is there are some
14 ramifications with 40 CFR Part 190 and the way it is
15 implemented under Part 20 regulation on 20, 1301(e).
16 So, this is another aspect that would need to be
17 looked at.
18 So, what I would like to do now is just
19 switch to the question and address these things one by
20 one.
21 So, the first one has to do with -- and
22 again, trying to keep this rulemaking simple,
23 essentially, what we are saying at this point, should
24 we evaluate all of these five items that were
25 previously shown in a slide or target only on the one

1 that essentially would normalize the numerical guides
2 in Part 50, Appendix I, to either ICRP 103 or ICRP 26
3 and 30, and leave all of the other requirements as
4 they are today with no changes, thereby expediting
5 this revision of Part 50, Appendix I?
6 On the second question, again, are there
7 significant implications on how this would be
8 implemented? So, you can see that the implication on
9 the regulatory guidance perhaps may be greater. We
10 may have to perhaps even expand the guidance. For
11 example, right now, we have NUREG 0543 that addresses
12 this. As we discussed earlier, this would be
13 collapsed into one single NUREG. Right now, the focus
14 is on, I believe the thinking is that, if you include
15 boiling water reactors, if you have up to four plants
16 at a specific site, and if you consider skyshine for
17 the turbine building, if you consider radwaste
18 storage, four plants would allow one to demonstrate
19 compliance with the 40 CFR Part 190.
20 But that was before the time where ISFSI
21 facilities were not in consideration, at a time
22 storing of large components such as steam generators
23 and other decommissioning components was not
24 considered at that particular time.
25 So, the thinking is that the analysis that

1 was done in NUREG 0543 would have to be, essentially,
2 revisited, and in addition to the traditional external
3 sources of radiation you would see at a plant, we
4 would have to consider these other types of sources,
5 ISFSI facilities, extended waste storage facility, the
6 fact that licensees may have to build interim a low-
7 level waste storage facility for Class B and C waste
8 in some instances. So these would have to be factored
9 into this revised guidance.
10 So, if there are any significant
11 implementation impacts on this or specific
12 considerations that the NRC should be aware of when we
13 approach this rulemaking process, or at least identify
14 in the first step in our SECY paper that is going to
15 be issued in October of next year, we look forward to
16 receiving some insights and some suggestions from
17 licensees and applicants.
18 So, with that, I would like to start
19 addressing these things. And what I can do at this
20 point is go back to that punchlist and maybe start
21 taking these things one by one and assess what the
22 thinking is, what the consequences are. Where do you
23 think we should be going on this? Are there some ones
24 that are more important than others? Should we focus
25 simply on revising Part 50, Appendix I, numerical

1 guide, the underlying dosimetry concept, and ignore
2 any of the rest of it?
3 I will leave it open to the panel.
4 MR. HODGKINS: Round robin? Ralph?
5 MR. ANDERSEN: Ralph Andersen, NEI.
6 You put a lot out there. So I'll try to
7 be brief, and then we can address things later in
8 written comments.
9 I think you ought to again look at the
10 transition from the 10 CFR Part 100 criteria to the
11 way that it was handled in rulemaking in Part 52, in
12 which the values of 25 rem to the thyroid -- or excuse
13 me -- 25 rem to the whole body, total body, and 300
14 rem to the thyroid were converted to a 25-rem TEDE
15 value.
16 In the case of those criteria, the 25-rem
17 TEDE value hypothetically created allowance of about
18 900 rem to a thyroid, if you do the math. And those
19 types of comments came flying in. You know, the NRC
20 was suddenly going to allow people to get 900 rem to
21 the thyroid.
22 What NRC did, in response to those kinds
23 of questions, is they actually looked at reality and
24 considered that that's categorically impossible to
25 conceive some kind of accident that has a pure iodine

release.

I would suggest that you look at 4-1, 4-2, and 4-3 both in the context of how that rulemaking was done. One, that you address all three of them, and that, two, it is very, very important that you look at the fantastic history of operating experience that we have.

Gamma and beta air doses are simply not an issue from lightwater reactors, period. End of story. And the question to ask yourself is, is it even really a practical consideration that those somehow become the limiting doses in some way? And also, revisit what their original basis was and why they are there.

Then, you could also look at the issue of integrating the organ dose into total effective dose, again, reviewing the logic for much larger doses that really had significant. You know, I would argue that 900 rem to the thyroid is a lot more significant than 5 millirem to the thyroid or even 15 or 25 or 75.

Our objective would be a single value because it provides maximum operational flexibility and not a single value per pathway, but a single value. Tell us the number we need to meet. Let us how to figure out to operate the plant in a way that

1 meets that, and how to design it in a way that meets
2 that.
3 And I think if you went that way, then
4 that puts you well-positioned to tackle issue 4-4,
5 which is, then, you should be able to come up with a
6 number that is technology-independent. Because,
7 really, you are defining as low as reasonably
8 achievable for the purposes of design. So, my
9 question would always be, why would you have a
10 different number for a different technology?
11 So, I would just suggest approaching those
12 kind of in that sequence, looking at the three dose-
13 related values and sorting out why those can't boil
14 down to a single number, and then looking at the 4-4,
15 as to why would you need different numbers for other
16 technologies.
17 And then, finally, on the licensed
18 operation issue, I do think it needs to be addressed.
19 I would hope that it is addressed, as you suggested,
20 in Part 20 thinking space, because I think there are a
21 number of other issues for non-reactor licensees that
22 would be similar in nature. So, I would just consider
23 that, that the issue is broader than just two co-
24 located nuclear plants owned by different people. As
25 you mentioned, ISFSIs play into that, too. You have

1 got to consider the possibility of centralized
2 storage. We now have centralized storage of low-level
3 waste going on.
4 So, there's really a lot of factors that
5 come in, but I think your fundamental question of how
6 would you sort things out between somewhat or entirely
7 different licensees is an important question, and I
8 think it should be addressed. But I would defer over
9 to the Part 20 discussion to go after that.
10 MR. HODGKINS: Thanks, Ralph.
11 MR. DEHMEL: So, that portion perhaps
12 could be put on the punchlist in the revision of Part
13 20 and divorced from this particular rulemaking, if we
14 were to proceed?
15 MR. ANDERSEN: I think that this area
16 would be an input to that issue, but resolution of
17 that issue broadly I just think would be conducted
18 better with the whole panoply of NRC licensees, rather
19 than seeing it as primarily a Part 50, Appendix I,
20 issue.
21 MR. HODGKINS: William? Brian?
22 MR. LITTLETON: Really, I think I can best
23 answer this group of questions by starting with what
24 the agency is doing with our kind of somewhat linked
25 standard of 40 CFR Part 190.

1 For that, right now, we are still doing
2 studies, and we are conducting studies on various
3 aspects. But we have not made any decisions on --
4 certainly, we haven't made a decision that we are
5 going to revise it, and we certainly aren't
6 predisposed to any direction particularly on any of
7 the aspects.
8 It was mentioned in relation to 4-4 about
9 what to do with, I guess, other designs outside of
10 lightwater reactors. Again, that is one question that
11 we picked up on because it would impact, I guess, how
12 we go forward with any potential revisions with 40 CFR
13 Part 190.
14 And so, we are doing some studies right
15 now on how different are effluents from these
16 technologies. And all I can say without -- I can say
17 that the initial feedback that we are getting is that
18 the effluents aspects are not that much different.
19 Pretty much the same suite of radionuclides are coming
20 from the high temperature gas reactors of one design
21 or the other as from the lightwater reactors, although
22 it may be slightly different percentages.
23 But, outside of that, we are still doing
24 studies and we have got no direction in mind as of
25 today.

1 There was mentioned, I guess, the issue of
2 how you all would handle sites that have multiple
3 reactors with maybe different operators. I think that
4 is an issue which I have written down because the
5 agency has not considered that yet. So, I will just
6 say that it is something that we don't have any input
7 on right now, but that I am going to go back and do a
8 little bit of research on that issue.
9 There were a couple of there issues I
10 might want to mention, but let me gather my thoughts
11 on that.
12 MR. HODGKINS: Okay. Thanks, Brian. We
13 will come back to you.
14 Larry? Michael?
15 MR. BOYD: Mike Boyd, EPA.
16 I don't know that this really affects
17 Appendix I limits, but just to speak to Ralph's
18 preference for one number to meet, I think just to
19 point out that the reality at EPA these days is that
20 any standards we write or rewrite will inevitably have
21 a groundwater protection provision separate from other
22 pathways. I think that is just the reality.
23 MR. DEHMEL: Jean-Claude Dehmel, NRC.
24 Groundwater pathway, that requirement will
25 be embedded in the current 40 CFR Part 190? Is that

1 what you are implying or suggesting?

2 MR. LITTLETON: There are some initial

3 thoughts that are saying that that's what we would do.

4 If we were to go that route and put a groundwater

5 pathway, it would be embedded into our existing 40 CFR

6 190, if we revise it. So, that is just the general

7 thinking about where we are.

8 MR. DEHMEL: Okay. Thank you.

9 MR. HODGKINS: Ed? Carolyn?

10 Okay, anybody from the audience want to

11 add to this discussion?

12 MR. MECK: Robert Meck, Science and

13 Technology Systems.

14 No. 4-2 stimulated this line of thought.

15 The objective is to provide an adequate level of

16 protection. And the common normalizing factor for

17 that is risk and detriment. I haven't really heard

18 that considered.

19 But if you consider that if you had a

20 guideline for what level of risk and detriment

21 provides that adequate level of protection, then the

22 organ and whole body and the air dose things sort of

23 get folded into an evaluation of that, and it can

24 remain a single number that provides a foundation for

25 the objectives of making dose calculations and then

relating those dose calculations to the risk or detriment.

Thank you.

MR. HODGKINS: Thank you.

Anybody else from the audience want to add a comment?

(No response.)

We do have a webinar participant. Cindy Bloom wrote in, "Organ doses are still limited under updates to ICRP recommendation, and one chooses the lower of the stochastic or non-stochastic limit for each radionuclide. So, it doesn't seem like there's a specific need to address some organ doses specifically. All organs should be considered in the development of effluent limits, as they are in 10 CFR Part 20, ICRP 26, 30, ICRP 60, and ICRP 103."

MR. DEHMEL: Yes, let me go over some aspect of what we covered so far and perhaps touching upon this morning.

It is that, if we embark on this process and we look at how we would change Appendix I, we could make what I mentioned or characterized earlier this morning, kind of surgical replacement, surgical changes to Appendix I, and that would be, in essence, kind of a simple rulemaking process. Or we could look

1 at all the recommendations that were made this morning
2 with respect -- for example, looking at option 3c,
3 with revising all of the models, the dispersion model,
4 the environmental transport model, atmospheric
5 dispersion model, and so on.
6 And going down this list, so if we go that
7 route, are we -- and this is posing a question now --
8 are we in a process by which we are changing the
9 paradigm of Part 50, Appendix I, and as a result of
10 this, we are in a complete different realm? Where
11 initially we thought we were going to realign Part 50,
12 Appendix I, in a context of, what will be done or what
13 is being considered for 10 CFR Part 20.
14 So, then, does that open up now us to
15 criticism and perhaps to more scrutiny in perhaps,
16 then, the process by which we would make specific
17 recommendations to the Commission maybe different than
18 what is being envisioned right now for the revision to
19 Part 20?
20 MR. HODGKINS: Ralph, do you want to go
21 first?
22 MR. ANDERSEN: The change from ICRP 26 to
23 ICRP 103 and Part 20 is not a substantial change in
24 the risk paradigm. The change from ICRP 2, which was
25 effected in 1990 in Part 20, but which we are really

1 talking about today for Appendix I, to any version,
2 26, 60, or 103, is in itself a significant change in
3 paradigm because the scientific understanding didn't
4 just change numerically; it changed conceptually.
5 So, in ICRP 2 space, the notion of being
6 able to integrate risk comparatively between
7 individual organs and the total body as an organism
8 didn't exist in 1959, 1960, drawing on data which was
9 still fairly young from the atomic bomb survivors.
10 So, it just wasn't enough information to be sure about
11 that yet, what the incidence of solid tumors was going
12 to be over time. Leukemia was starting to sort itself
13 out, but not enough, that we still felt a need to keep
14 total body.
15 You know, there were a lot of things that
16 went into why it is the way it is in ICRP 2 that
17 changed fundamentally when we went to ICRP 26. So, as
18 a starting point, Jean-Claude, if the Commission
19 doesn't already get that, you ought to help them get
20 that. It is a change in paradigm to go from ICRP 2 to
21 ICRP 26, period.
22 Secondly, I think that what gets lost is
23 -- and you said it at the outset, but I think it does
24 get lost in the thought process sometimes -- these
25 aren't limits that assure adequate protection of

1 health and safety. They are not. These define design
2 features that represent as low as reasonably
3 achievable. These are on the far end of the spectrum.
4 And they set a threshold below which you consider
5 additional actions that might be taken based on a
6 cost/benefit ratio.
7 So, they provide objectives that you need
8 to meet at a minimum to get you your license. I mean
9 forget about the new 52 process. Let's just think
10 back to the plants that are currently licensed and
11 operating. You had to do at least that good.
12 But once you had done that good, the
13 presumption was that the plant would operate with
14 effluents that were as low as reasonably achievable by
15 definition, unless it could be shown that there were
16 other technologies that you could implement at a given
17 cost/benefit ratio.
18 So, I anguish a little bit when I hear us
19 struggling with integration of values and stochastic
20 and deterministic effects, and things like that. We
21 are not in that universe.
22 I know of no deterministic effect that
23 occurs at 5 millirem per year to any organ or 25
24 millirem or even 75 millirem to any organ. We are not
25 in that space.

1 The only reason you've got three limits in
2 40 CFR 190 is because that is what ICRP 2 offered at
3 that time. If that rule hadn't been written until
4 ICRP 26 came out, you probably would have a single
5 value.
6 So, you know, I would suggest that, as far
7 as extending the fact that you are changing the
8 fundamental paradigm should set the stage for you to
9 be able to propose additional reforms within the
10 regulation that go well beyond that, as an extension
11 of the fact of making a basic decision about changing
12 the basic paradigm.
13 But I do think it is important that you
14 communicate to the Commission, in case they don't get
15 that, that that is a fundamental change.
16 MR. HODGKINS: Brian?
17 MR. LITTLETON: I also wanted to add some
18 thoughts because our efforts are so very similar,
19 whether we revise 40 CFR 190, again, along with any
20 potential revisions that you all do for Part 50,
21 Appendix I, or Part 20.
22 Some of our thoughts, because when we
23 started talking looking at 40 CFR Part 190, the
24 primary focus was the dosimetry and the outdated
25 dosimetry that was in our regulation. But when we

1 started talking about unraveling it and relooking at
2 it, then we actually started saying, well, why don't
3 we go back to the original principles of this
4 regulation? Because when we started talking details,
5 there were some things that were inconsistent. Some
6 of the assumptions are inconsistent. Some aspects of
7 our regulation were just, you know, we didn't like, so
8 to say, and I won't go into any details.
9 So, we had to go back and started looking
10 all the way back to the original principles and
11 saying, okay, well, if we keep these principles -- so
12 we wanted to keep those four guiding principles.
13 There are four guiding principles. Then, if we kept
14 those principles, can we relook at and develop a
15 better standard? And we have provided some of that
16 feedback to our management for them to make a decision
17 on which way we should go here.
18 But we wanted to keep the principles, but
19 we found it was impossible to separate, I guess, just
20 a small dosimetry update from going and looking at the
21 total rule because the reality of the situation is
22 that, if we just do a dosimetry update, and that's the
23 only thing that we do to 40 CFR 190, then we may never
24 look at this rule for another 20 or 30 years. And we
25 didn't think that that was the right viewpoint to take

1 as well.

2 So, we thought that if we are going to go

3 back and take a look at it, then we probably need to

4 take a look at everything in there and then make a

5 decision on what we are going to do.

6 So, it is something that we are struggling

7 with as well. So, I can't provide you with any

8 definitive direction there, but just some of our

9 initial thoughts.

10 MR. DEHMEL: Jean-Claude Dehmel, NRC.

11 This is a question for the EPA. So, it

12 looks like -- this mic is very good -- it looks like

13 we may be ahead of the EPA in trying to amend our

14 regulation. I mean that is the way it looks like

15 right now.

16 We are going to get a SECY paper to

17 Commissioners at the end of next year. And then it's

18 possible that we may be given a specific

19 recommendation to proceed in 2012, 2013.

20 I don't know what the timeframe is for the

21 EPA. But let's kind of look into the future now and

22 say, well, let's assume the NRC essentially is out of

23 the gate first. We are marching along the way, and we

24 stumble across now there's this coherence between EPA

25 regulation 40 CFR Part 190 and our requirement in Part

1 50, Appendix I, and actually Part 20 implementation of
2 the 40 CFR 190 limit.
3 How would we proceed at this point? Would
4 the NRC be essentially kind of almost held hostage
5 until we wait for the EPA to make a decision? Or
6 could we simply have, for example, an MOU with a
7 technical attachment that would essentially serve as
8 an interim measure in addressing these technical
9 differences between 40 CFR 190 and however we end up
10 revising Part 50, Appendix I?
11 MR. LITTLETON: Thank you for the hot
12 potato.
13 (Laughter.)
14 Well, I think that there's a premise that
15 you all are a little bit in front. Although it may
16 sound like it, I guess I would say that if we choose
17 to revise the standard, I think our efforts are pretty
18 much synched.
19 We started talking about, I guess,
20 internally that if we do choose to go this route, an
21 ANPR of sometime around maybe the late spring or early
22 summer, and then maybe a possible proposal to come out
23 for this maybe sometime around fall or winter of 2012.
24 So, the good news is that I think the
25 efforts may be synched up pretty well, if things come

1 about in a timely fashion.

2 But I guess, regarding the other aspect of

3 that, of your question, it is kind of hard for me to

4 answer. I know there are a lot of -- I guess our OGC

5 would answer it in one way. I would think that they

6 would say that, whatever we come out with on 40 CFR

7 190, then, you know, it doesn't matter what the NRC

8 has; they are going to have to consider and take it

9 into account as far as implementing these standards.

10 So, that is a touchy issue. It would

11 probably take a group of our attorneys and your

12 attorneys to get to the bottom of it. That is

13 generally what has happened in the past. I guess that

14 is my answer.

15 As far as the timing thing, I think things

16 look good. The other aspects of it, coordinating

17 that, you know, hopefully, if the timing works out, it

18 won't be an issue. If it doesn't, then we are talking

19 about pulling our attorneys in, and I'm not an

20 attorney.

21 MR. DEHMEL: Does that mean that -- how

22 are you going to fold this with this effort, if you

23 are going to include groundwater, how are you fold

24 this with the Office of Drinking Water? How is that

25 going to work?

1 MR. LITTLETON: Well, the drinking water,
2 when the agency determines that we are going to revise
3 a standard, we send out invites for a formal work
4 group internally within the EPA and invite folks for
5 any affected office. So, anything that we come out
6 with, certainly, we would come out with a proposal,
7 maybe not at the time of the Advanced Notice of
8 Proposed Rulemaking because that is just getting input
9 from the various stakeholders, but definitely when we
10 come out with a proposal, we have taken into account,
11 I guess, probably most likely the Office of water and
12 their desires as far as what we should put out in any
13 proposed rule. So, that will be taken into account.
14 MR. DEHMEL: Thank you.
15 MR. HODGKINS: Don?
16 DR. COOL: Don Cool, NRC.
17 To pick up on that, and another question
18 that you may not be able to answer now, but to put it
19 out on the table, we have been talking over the last
20 few amounts about the paradigm and a shift that would
21 move to effective dose, which pulls together doses
22 from various pathways of exposure to various organs or
23 components of the body, and assembles that into a
24 single, more or less, risk-informed -- I'm not going
25 to say risk-based necessarily -- value that we

1 measure.

2 So, as the NRC staff has looked at this in
3 moving from the old ICRP 2 methodology of whole body
4 and organs to an effective dose, and then we put the
5 questions up as to whether additional organ values are
6 necessary, whether additional specifications for air
7 are necessary, some of those seem perhaps conceptually
8 to be a bit in conflict with the whole concept of
9 effective dose.

10 And I am just wondering how within EPA, in
11 particular, but others would look at it. Because it
12 would seem that that same conflict would exist within
13 EPA if EPA chose to move 40 CFR 190 or any of the
14 other generally-applicable environmental standards to
15 an effective dose model, to then, additionally and
16 separately, call out one pathway which is already part
17 of that calculation and how you reconcile those two
18 differences? Because that would seem to have some
19 implications for how you would do your rule and how we
20 might have to look at it in our rule.

21 Because one of the things that has been
22 discussed here is, you put an effective dose number
23 out there. It is a pretty small number, and you don't
24 have to play air, water, airborne, to gaseous
25 effluents, or otherwise, because it is all wrapped

1 into effective dose.

2 How do you reconcile that discrepancy?

3 It's the hot potato with chili.

4 (Laughter.)

5 MR. BOYD: Not knowing who is on the

6 webinar, I am going to tread bolding into this O.K.

7 Corral.

8 I think the last time we stood off facing

9 each other, we blinked first because you got a license

10 termination rule and we did not get a cleanup rule.

11 But the issues are still there. The arguments are

12 still there. And frankly, the statutory requirement

13 for anti-backsliding under the Safe Drinking Water Act

14 is the gorilla in the room that has to be dealt with.

15 We would like effective dose, we at the

16 staff level. I'm not speaking for the agency, but we

17 at the staff level would definitely like to regulate

18 using effective dose. But the lawyers and the

19 congressional mandates sort of stand in the way at

20 times.

21 DR. COOL: Just out of curiosity, is 40

22 CFR 190 issued under the Atomic Energy Act or the Safe

23 Drinking Water Act, or both? I thought it was the

24 Atomic Energy Act.

25 So, not being a lawyer, I wonder why the

1 legal provision of the Drinking Water Act, which is
2 not within the Atomic Energy Act, would have to apply
3 in this case?
4 MR. ANDERSEN: Can I try a couple of
5 things just real quick?
6 I'll make some bold -- since I'm not a
7 lawyer, I can always make these bold assertions, and
8 then, unlike Don on Monday, my lawyer isn't sitting in
9 the back of my room.
10 (Laughter.)
11 One is I know of no statutory authority
12 for EPA to apply the back-sliding act to groundwater.
13 It doesn't exist. That is a matter of agency policy.
14 The back-sliding provision applies to safe
15 drinking water, and you have defined what safe
16 drinking water is in your regulations. You know, it
17 is commercial water providers that have -- what? --
18 more than 20 outlets, or something like that.
19 I appreciate and understand what EPA has
20 done as a matter of policy for groundwater protection,
21 and I appreciate that, undoubtedly, if you go through
22 a rulemaking, you are going to end up with a Safe
23 Drinking Water Act provision.
24 But, just for everybody else's
25 edification, I didn't want them to mistake that, think

1 that that is at the direction of Congress. It's not.
2 Two is that I don't believe that the fuel
3 cycle standard -- 40 CFR 190 I believe was actually
4 issued under Reorganization Plan No. 3, not under the
5 Atomic Energy Act. I don't recall that EPA has any
6 authorities at all under the Atomic Energy Act. I
7 don't think EPA is even in the Atomic Energy Act.
8 I thought those standards were issued as
9 part of your authority to issue generally-applicable
10 environmental standards when the EPA was created under
11 reorganization, which was eventually codified in a
12 1994, I think it was -- I've got the dates wrong --
13 1974 law that essentially adopted Reorganization Plan
14 No. 3. But just for clarification.
15 MR. BOYD: Well, it was Reorganization
16 Plan No. 3 that transferred authorities to EPA, but
17 the authorities were included in an amendment to the
18 Atomic Energy Act where it says, anywhere in the
19 Atomic Energy Act where it says "the Federal Radiation
20 Council", it now says "the Administrator of the EPA"
21 and things like that.
22 So, we are in the Atomic Energy Act as
23 responsible for setting generally-applicable
24 standards.
25 MR. ANDERSEN: Even better than having a

1 lawyer in the room.

2 (Laughter.)

3 MR. HODGKINS: How are we doing with that

4 discussion? I guess we've got a webinar participant

5 question.

6 Again from Cindy Bloom. Thanks, Cindy,

7 for sticking with us.

8 "Agreed that 10 CFR 50, Appendix I,

9 incorporates ICRP 2, which focuses on organ dose

10 limits, but I was under the impression that an update

11 to at least ICRP 26, 30, if not 103, was a given in

12 this discussion. Am I mistaken? Is keeping the

13 status quo a considered option for the 10 CFR Part 50,

14 Appendix I?"

15 MR. DEHMEL: Jean-Claude Dehmel, NRC.

16 Yes, it has been retained as a status quo

17 option. Yes.

18 Again, at the staff level, our

19 recommendation would be to revise ICRP 103, but that

20 decision is going to be made by the Commission.

21 DR. COOL: To elaborate on that just a

22 little bit -- Don Cool from NRC -- even without our

23 lawyers in the room, the first option is always you

24 don't have to do anything, to maintain the status quo.

25 So that is certainly one possibility.

1 Then, the question is, is that the best
2 possibility, given all the information that is
3 available? What are the pros and cons of moving to
4 any one of the other options?
5 So, the reason that we are having some of
6 these discussions is that, in light of the many
7 changes in the science, in the methodology, in the
8 approaches, does it make sense to move from the status
9 quo, the existing regulation, to something else?
10 And I will take this opportunity to very
11 briefly just go back and touch what I think may have
12 been her earlier web question, which had to do with
13 the organ doses versus the effective dose in ICRP 26,
14 and then, as that gets translated forward, in ICRP 60
15 and ICRP 103.
16 It is true at occupational dose levels,
17 depending on the radionuclide, because of the
18 differences in the sensitivity to developing cancer,
19 that enough radioactivity material could become
20 concentrated in an organ to cause direct deterministic
21 effects in that organ before you would reach the
22 cancer induction threshold, which is the equivalency
23 that is used to form the effective dose.
24 Now, for the most part -- in fact, I think
25 entirely -- when you move to lower levels of effective

1 dose, so that you are no longer at the occupational
2 exposure levels of 5 rem or 2 rem here, but, rather,
3 you are down now in the levels that we are talking
4 about for Part 50, Appendix I, of 5 rem, 5 millirem,
5 not 5 rem, three orders of magnitude lower.
6 And look at that equivalency in effective
7 dose, and you look across the various tissue weighting
8 factors. You find that it is no longer possible for
9 there to be a sufficient accumulation of a
10 radionuclide in those models to cause any other
11 effect. So, in fact, at those kinds of levels, it is
12 the effective dose that always ends up being the
13 controlling factor in the analysis.
14 Hence, why you see the question as to
15 whether or not it is necessary to continue with other
16 organ doses because this modeling methodology -- and I
17 would invite anyone else to chip in -- but this
18 modeling methodology suggests that, at these kinds of
19 levels, you can't get organ doses that are of separate
20 concern.
21 MR. HODGKINS: Any reactions?
22 DR. COOL: I hope that helps Ms. Bloom.
23 MR. HODGKINS: Huh?
24 DR. COOL: I hope that helps Ms. Bloom.
25 MR. HODGKINS: Okay. Any reactions to

1 that? Any reactions, again, from the audience?
2 (No response.)
3 Okay. From the panelists?
4 (No response.)
5 Are we ready to move on then? Discussion
6 is good?
7 Then, I think Question No. 5, really, it's
8 just opening it up to the entire group as far as, is
9 there any lingering questions, any comments, any last
10 wishes in this discussion that I wish we could have
11 discussed or it would be nice to have heard or here's
12 what I'm thinking and it wasn't addressed?
13 And No. 1 is closed down (referring to
14 microphone). We've got to go to No. 2. We have
15 someone at the microphone. Thank you.
16 MR. WRIGHT: This is Tim Wright. I'm
17 speaking as a private citizen, not as somebody from
18 Duke Energy.
19 I would like to address this last salvo of
20 discussions between the EPA and the NRC. As a private
21 citizen and as a taxpayer, I would strongly encourage
22 you guys to play together and come to some consensus
23 to not fight each other on these issues because, when
24 you do that, you're wasting my taxpayer dollars.
25 MR. HODGKINS: Thank you. A wish.

1 Michael?

2 MR. BOYD: I just want to say I was

3 referring to some old fights that everybody is

4 familiar with and the legal reasons why some of those

5 issues don't go away.

6 But, just speaking personally now, I'm

7 getting along great with my NRC counterparts, and we

8 are doing much better than we used to. Thank you.

9 MR. HODGKINS: All right. Wonderful.

10 Roger?

11 MR. PEDERSEN: There is an issue that we

12 haven't really brought up, and that is, should we be

13 couching any change to Appendix I in terms of an

14 implementation of the concept of constraint that is in

15 103?

16 I have heard Appendix I being used as an

17 example of where we, in fact, use a constraint, but

18 that is not what Appendix I was originally designed

19 for. The concept of constraint wasn't even there.

20 And if we do that, is there maybe some

21 downside to doing that? You know, whether that is a

22 good idea or not, since the ICRP uses a concept of

23 constraint in at least three different ways that I

24 know of in the document?

25 One of them is the value at which, as I

1 said yesterday, you pre-determine that you might not
2 be ALARA. And the current numeric values in Appendix
3 I are viewed that way, because there is an ALARA
4 provision in Appendix I below that.
5 One of the other uses of the term
6 "constraint" in there is the value that would be
7 applied to separate sources, so that the sum of the
8 doses from those separate sources would be ALARA to a
9 member of the public or a single individual who was
10 exposed to those separate sources. And if you look at
11 it that way, that sounds similar to what 40 CFR 190 is
12 attempting to do.
13 I guess I'm bringing that up. Should we
14 try to couch these changes in terms of implementation
15 of a constraint concept, and being overt about that,
16 or just ignore that whole concept and do what we need
17 to do in terms of changing the dosimetry and numeric
18 values?
19 MR. HODGKINS: Any reaction to that from
20 the panelists?
21 Brian?
22 MR. LITTLETON: I had the idea of
23 constraints in the back of my mind -- this is Brian
24 Littleton with the EPA -- when we had internal
25 discussions regarding groundwater provisions. And

1 then, knowing the past history between EPA and NRC on
2 this issue, and that has been that the NRC has been
3 reluctant to enforce a separate groundwater standard
4 because they believe that, I guess, protectiveness to
5 the whole body is protective enough. That is kind of
6 just a real blunt type of explanation of some of the
7 previous discussions.
8 I don't know the extent to which that is
9 changing. We, obviously, have the NRC's Groundwater
10 Task Force that has been convened to look at the
11 problem of groundwater coming from some of the nuclear
12 power plants and other facilities.
13 So, I think there is a change, but I'm not
14 sure how far that change is going to go, if that is
15 going to be a wholehearted acceptance of maybe a
16 separate groundwater protection requirement or if it
17 is just I guess studies. I'm not sure what the
18 endpoint is.
19 But I did look at the issue of constraints
20 and had that in the back of my mind as one way that,
21 if the NRC did not accept, I guess, the charge of
22 protecting groundwater, that they might be able to say
23 that we are being protective of this, of the agency's,
24 you know, any agency MCL that may come down for
25 groundwater because we have included, I guess, some

1 sort of provision -- and I am not sure how that would
2 be worded -- as a constraint in maybe Appendix I.
3 That was a thought that was in the back of my mind.
4 I am not sure how that would happen. I
5 think there would probably be quite a few meetings
6 between the two agencies before that came about. And
7 it is not salient right now because we don't have a
8 separate pathway as far as nuclear power operations
9 facilities are concerned right now.
10 MR. HODGKINS: Thank you, Brian.
11 Ralph, did you want to add something?
12 MR. ANDERSEN: Ralph Andersen, NEI.
13 I just wanted to pick up on Roger's
14 comment that, yes, I do think that is something that
15 ought to enter into the thinking. You know, our new
16 nomenclature in radiation protection space ought to be
17 well-defined. And if we are going to have a third
18 category called "a guideline", we ought to be able to
19 distinguish that category from limit or constraint.
20 That ought to be something that is taken into
21 consideration in the rulemaking. Or, alternatively,
22 if we are going to consider these things to be
23 constraints going forward in the future, then we ought
24 to capture that as well.
25 But some of the stumbling around we have

1 done over the years has been around the notion that we
2 are not quite sure what these things are. We know how
3 to use them, and we have used them very well, but they
4 kind of defy definition.
5 So, I do think that would be a good thing
6 to address, both in the SECY paper and in the ultimate
7 rulemaking, is create the category that they belong
8 in, define the category, and then we know how they fit
9 into the regulatory scheme.
10 MR. HODGKINS: Thank you, Ralph.
11 Any other reaction from the audience?
12 (No response.)
13 From the panelists?
14 (No response.)
15 Then we have a webinar question from Cindy
16 Bloom once again.
17 "So you only use the stochastic ALI? It
18 seems like EPA uses non-stochastic ALI."
19 Yes, Michael?
20 MR. BOYD: I don't know what a non-
21 stochastic ALI is. I think it is all based on
22 stochastic, isn't it? I mean the ALI is supposed to
23 be the amount that you can take in in a year that
24 would meet, I guess, nominally, the 50-millirem number
25 in Appendix B?

1 But another display of ignorance. So I
2 will let either the lawyers or the other HPs in the
3 room correct me.
4 My recollection is that the derived air
5 concentrations and the allowable limits on intake
6 actually are the most restrictive of either the
7 concentration that would hit the effective dose
8 equivalent level or the committed dose equivalent
9 level.
10 Isn't that right, Roger? Yes, it's the
11 more restrictive of the two. So, in some cases, they
12 are actually deterministic-based. That is especially
13 true for some of the transuranics, if I am not
14 mistaken, that they don't actually equal 5 rem total
15 effective dose equivalent. They actually equal 50 rem
16 to a particular organ.
17 DR. COOL: Don Cool.
18 That is correct at the occupational level.
19 And what I was trying to point out is, when you,
20 then, move to the lower levels of dose and do the
21 division by 10 or 100 or 1,000, the connection no
22 longer gets you back to a committed effective dose for
23 an organ that would be limiting. They all, then,
24 relate to the cancer incidence projection, which means
25 that they are all the stochastic values, as I recall.

1 MR. HODGKINS: Ralph?

2 MR. ANDERSEN: Since we are doing health
3 physics things, just to add onto that, the notion
4 behind the non-stochastic effects is that there is a
5 threshold. And the point Don is making is that, when
6 you control doses at those very low levels, those are
7 well below the thresholds for deterministic effects.
8 So, the probability of the deterministic effect is
9 zero. That is why it isn't necessary to have
10 additional criteria to be protective, if you are
11 already protecting the dose down at those low levels.

12 MR. HODGKINS: Okay. Any other comments,
13 questions, as far as the content of what we are
14 talking about today? Any additional content issues?

15 (No response.)

16 Then, let's just move on a little bit
17 faster with the process. And I guess it is the same
18 sort of question as far as the process.

19 How did we do? Is there a way we could
20 have done it better or you wish we had a chance to, so
21 as far as that process?

22 And, Carolyn, because I haven't started
23 with you in a while -- Ralph's been hogging -- I'll
24 start with you as far as that process, what you think,
25 and is there a way we could improve it or did we do

okay?

MS. HILL: I think you did okay.

MR. HODGKINS: All right. Ed?

MR. ROACH: All right, back to the karaoke microphone.

This is Ed Roach and I'm from Health Physics in the New Reactors Office of NRC.

I thought the process worked well. I was appreciative of all the engagement of the members of the panel who participated and the other members who attended and gave some insight into both the history and historical approaches that we have used in the past.

MR. HODGKINS: Thank you.

Okay, Michael?

MR. BOYD: I enjoyed the process a lot. I think I'm remembering something that Donald Rumsfeld. You know, it's the stuff you think you know for sure that you don't know that really gets you in trouble, and I have learned that myself today. So thank you.

(Laughter.)

MR. HODGKINS: Larry?

MR. HAYNES: Larry Haynes.

I have also enjoyed the process, all three days.

1 I would have liked to have had more power
2 reactor representatives here from our peers.
3 Hopefully, there's some on the webcast that we don't
4 know about and we'll get some feedback from those
5 folks as well.
6 MR. HODGKINS: Excellent. And they still
7 have until January 31 to make some comment.
8 Brian?
9 MR. LITTLETON: I think the process here
10 was very good. I actually took home, between the
11 three days, I took home quite a few points that will
12 help me out in my job of determining whether we are
13 going to forward with revising 40 CFR Part 190 from
14 the conversations that happened the previous two days
15 and today. So I think it was very helpful for me and,
16 hopefully, helpful for others out there on the phone
17 as well.
18 MR. HODGKINS: Roger?
19 MR. PEDERSEN: You must have handed me a
20 dead battery?
21 MR. HODGKINS: I did.
22 MR. PEDERSEN: Yes, I think this
23 structured, open discussion is an outstanding format,
24 particularly at this stage of what we are doing, which
25 is mostly brainstorming as to collecting ideas,

1 collecting input, collecting information from sources
2 that we don't readily have access to.
3 Unfortunately, as Larry said, there
4 weren't more operating reactor folks here, but I
5 believe that has to do with outage schedules and
6 stuff. So the timing of that was unfortunate, but we
7 will work through that.
8 And, you know, I heard some comments
9 about, and I made a few of them myself, that the
10 answers to the questions that were posed depends on
11 the answers to other questions as they get resolved.
12 So, I assume that this is somewhat of an iterative
13 process. Maybe not this exact format, but we will be
14 provided many more opportunities for stakeholder input
15 as we go through the process.
16 MR. HODGKINS: Absolutely.
17 William?
18 MR. SMITH: William Smith, Southern
19 Nuclear Company.
20 I like the process, and I think it went
21 real well. By having the different questions, it kept
22 us focused.
23 But, again, like Roger mentioned, when the
24 answer is dependent on something that we don't know
25 what the answer to it is, it is hard to answer that

1 question right now. Probably I don't know how you
2 could change that though.
3 MR. HODGKINS: Okay. Ralph? Exit
4 comment?
5 MR. ANDERSEN: Yes, Ralph Andersen, NEI.
6 I thought that it went exceedingly well.
7 I really thought that the structure really facilitated
8 a good interchange and getting all the views out on
9 the table. So, from a process point of view, I
10 thought it really went well.
11 The only suggestion I would offer is, not
12 knowing what your attendance might be outside the
13 Beltway since we are actually inside the Beltway right
14 now, when you go to LA and Houston, I would suggest
15 adding one additional slide to Don's presentation on
16 the very first slide. Look at the background
17 information in The Federal Register notice, and I
18 would have a fundamental slide that basically says
19 what is Part 20.
20 You may have members of the public
21 attending in either LA or Houston that aren't going to
22 -- Don's first slide right now starts talking about
23 which vintage of ICRP we use. And it struck me that
24 you might want to have an introductory slide that says
25 what is the regulation we're talking about and what's

1 it for. And like I said, your writeup in the FRN
2 gives the right bullet points.
3 MR. HODGKINS: Excellent.
4 Jean-Claude, did you want to add anything
5 to the comments? Did you get what you needed? Yes?
6 I'm going to turn it back over to Don.
7 One parting comment, I would say, as far
8 as someone from the outside looking in, your parents
9 have got to be really proud of you because the
10 language you guys have been using, if one of my kids
11 came home saying some of the stuff I heard, I would be
12 damned proud of you.
13 (Laughter.)
14 DR. COOL: Thank you very much.
15 We, the NRC staff -- and I think I can
16 speak for all the different pieces of the organization
17 that are here -- very much appreciate the time that
18 each of you has taken, travel hours and otherwise in a
19 number of cases, to come and help us understand better
20 some of these issues.
21 This is not your last chance. So this is
22 yet another reminder. You say it again. You tell
23 what you told them. Then you tell them what you told
24 them again. This is the I'm telling you what I told
25 you and saying it again.

1 Because when you leave today and you ride
2 the Metro back or you drive back or you climb on the
3 airplane, or whatever it is, and you think of some
4 additional things and you ponder it, we invite you,
5 encourage you, almost beg you, to write it down and
6 send it in. Because the whole point of gathering this
7 information is to try to help us see as many of the
8 issues from as many points of view as possible.
9 What we are trying to do is assemble all
10 of that, so that we can have the best possible
11 recommendation with all of the different vantage
12 points as possible.
13 So, please, send us in additional things.
14 Send them to our email address, which is in that
15 Federal Register or various and sundry other things.
16 In addition to that, by NRC standard
17 protocol, I have to remind all of you that we would
18 love to have feedback forms, if you had some
19 additional feedback or if you decided to wait until
20 today to do that, in addition to the round robin that
21 we have had here in terms of how this worked.
22 We will be doing this twice more. We will
23 be out in Los Angeles next week, and we will be down
24 in Houston the week after that. So, we will be well
25 outside the Beltway, and it will be very interesting.

1 Thank you for the suggestions, and if you
2 have got any other additional ones, we have got a day
3 or two to tweak them a little bit.
4 The record on our public website available
5 in our document management system will include all of
6 the slides, including things that were created here
7 and couldn't necessarily be handouts. Those will be
8 available publicly within a few days after we can get
9 those back into our document management system, so
10 that everyone will have an opportunity to see that.
11 The meeting has been transcribed. That
12 will take a little bit longer for our court reporter
13 to be able to go through and sort it all out, and
14 figure out all of the acronyms and otherwise that we
15 have tossed about the room. But those will eventually
16 also be publicly available, so that you can go and
17 read them.
18 I have had a couple of people ask me
19 whether or not those are going to be available before
20 the LA meeting, and I wouldn't count on that.
21 But, with that, I thank you very much.
22 I don't think I have forgotten any
23 specific things.
24 I wish you careful travels on the wet
25 roads in D.C.

1 Thank you very much.

2 (Applause.)

3 (Whereupon, at 2:29 p.m., the proceedings

4 in the above-entitled matter were adjourned.)

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