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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

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

C-O-N-T-E-N-T-S (CONTINUED)

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

8:36 a.m.

MR. HODGKINS: Good morning.

We'll have everybody migrate to their seats this morning.

And for those on the webinar, it seems like we'll probably have a few people coming in a little bit later, as I understand it. There may be some backup, and consequently, some time that it will take in order to get everybody here in their place.

Let's just, because there are new participants, I just want to go over the groundrules for today, so that everybody knows what's going to happen.

As far as on the webinar, we will not be taking questions over the phone. There was too much problem with that in day one or day two. So, if you will please write your questions or comments, type them in, and then we'll have them read in the meeting. Okay?

For the participants that are at the table, we will usually start off with you folks discussing some of those issues. We'll then, after that, put it out into the audience for any comment or feedback from the audience, and then also use the

webinar comments for the final closure of whatever issue that we will be using.

Each area we'll do some discussion. Upon closure, we'll move to the next one.

I'm going to hand it over to Don to do an introduction, and I think we're ready to begin.

Welcome.

DR. COOL: Okay. Good morning.

MR. HODGKINS: Good morning.

DR. COOL: Okay. There are at least a couple of people who have had some of the coffee back there, and that's a good thing. All right.

Today is day three or day one, depending on how you want to look at it. Today has a very different focus than the discussions that we had the last two days, but they are connected in a number of key respects. Because the discussions that we will have today do still look at radiation protection criteria that are in the NRC regulations. And in fact, today we are going to explore one of those places in the NRC regs that dates back to 1960. So, we'll just set that stage.

The agenda items today, there are four major discussion issues that we will go through. We will come back to that after a little while, but I am

going to see if I can manage to have the computer change the slide.

And you should have these in your handouts, so that you can follow along, and we can flip back and forth.

How we are going to do this today is I am going to give you a brief overview and introduction of some of the connection and background related to Part 50, Appendix I, and the overall staff activities. Then, once we get into the details of each of the issues and the options and the questions, I am going to be handing this off to some of my colleagues that are here from the NRC who deal with this on a day-to-day basis, because if I tried to describe it to you, I would mess it up.

Having said that, we are going to try to go through some of the issues. 10 CFR Part 50, Appendix I, and I suspect that everyone in the room knows that this is the part of the regulation that deals with the reactors, and specifically the planning criteria that are associated with effluents and keeping those as low as reasonably achievable. I guess it's fair to say that it is outdated.

As I said, we go back to the methodology from ICRP 2, where they talked about maximum

permissible concentrations, MPCs, in the body from various radionuclides and dose to the whole body, and some doses to organs. Those concepts were updated and replaced by what the NRC called total effective dose equivalent that came from the recommendations of ICRP 26 and 30 in 1977, which were subsequently updated yet some more and called effective dose with some further changes in the details of the calculation in 1990 with ICRP Publication 60, and which have continued to the most recent set of ICRP publication recommendations in Publication 103.

We spent a lot of time talking about some of those terminology changes over the last couple of days, particularly on Monday morning as the first topic. We will come back and revisit a little bit of that this morning because one of the issues, perhaps rather obviously, is the question of whether we should take this regulation and realign it with the newer concepts, dosimetry terms, and otherwise.

But, right now, we have an outdated system that is a bit inconsistent with the current recommendations. That doesn't mean that we don't have adequate protection. We need to start at that standpoint.

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

the MDAP, the Multidisciplinary Design Approval and Evaluation Program, using resources in a variety of countries looking at consistency in calculational approaches and assumptions, and the sorts of things that need to be looked at to ensure that there are safe designs for the new facilities.

These sorts of things make it just a wee bit complicated to talk the same language, to have the same approach, and to explain it to anybody out there. If I put myself in the mode of, well, I've got to walk down out of my building, onto the plaza in front of White Flint, and try to explain this to the folks from CNN and CBS and ABC and Fox, and otherwise, this would be a rather tough chore. I think we would all agree with that.

So the question is, what can we do? What are some of the issues that are associated with it? As I said, we believe that it is working. There is not something here which is fundamentally broke in the sense that there needs to be an immediate change; otherwise, there's no longer safety, there's no longer issues; radioactive material gets out into the public or otherwise. That's not what is happening here.

What we do want to look at is the question of trying to, as I said on Monday, look at increasing

alignment with the various international recommendations and the terminologies, and otherwise. It is not that we want to change fundamental design criteria. It is not that we are looking to necessarily fundamentally alter in any way the design objectives, the level of safety that needs to be achieved, or otherwise, but to try to have those representations moved in such a manner that there continues to be adequate protection of public health and safety; there continues to be the appropriate emphasis and discussion on optimizing protection, achieving exposures and releases that are as low as reasonably achievable, and doing it in a way that for us meets our fundamental goals of regulations, that it is clear, that it is explainable; it's logical; it's reproducible; everybody understands the kinds of activities that are going on.

And so, with that background associated with these, I'm going to now turn it over to some of my colleagues to start walking through some of the details of the issues.

Jean-Claude Dehmel?

MR. DEHMEL: Thank you, Don.

As a matter of preface, all the information that is presented here is contained in

Section 4 of The Federal Register notice dated September 27th.

Yes, Roger?

MR. PEDERSEN: Yes, I can't get the microphone on, but how about if we go around the room and introduce ourselves since this is a different panel today?

MR. DEHMEL: Good point. We missed that.

So, Don, we know who Don is.

My name is Jean-Claude Dehmel. I'm with the Office of New Reactors. I'm a health physicist.

MS. HILL: Hello. I'm Carolyn Hill. I'm with the S.M. Stoller Corporation, and I don't know how you want to classify me, maybe as an informed member of the public. But we have actually been looking in-depth at some of these issues for a Japanese utility for the past couple of years. So, that is our interest in participating today.

MR. BOYD: Mike Boyd. I've been here the last two days. I'm a health physicist at EPA. Thanks.

MR. HAYNES: Larry Haynes, Duke Energy. I've also been here the last two days.

MR. LITTLETON: Brian Littleton with the EPA's Radiation Protection Division. I've been here.

It will be our group that will be looking into whether we want to revise a standard, 40 CFR Part 190, which is our nuclear power operations radiation protection standard.

MR. PEDERSEN: Roger Pedersen, NRC, Office of Nuclear Reactor Regulation. I'm mostly concerned about our Part 50 licensees, the operating licensees, and those plants that are trying to get licensed, the delayed licensing process under Part 50.

MR. SMITH: My name is William Smith. I'm with Southern Nuclear Company, a health physicist. Southern Nuclear Company has three operating plants, and they are in the process of licensing a unit 3 and 4 to operate in 2016.

MR. ANDERSEN: Is that a firm date?

MR. SMITH: Yes.

MR. ANDERSEN: Ralph Andersen with the Nuclear Energy Institute.

MR. HODGKINS: Thanks so much. That was a good practice for speaking directly into the microphone.

Just a test to see, the webinar participants, did they hear that? They did not? It was breaking up? Okay.

So, I tell you what, why don't you go

ahead, Jean-Claude, and then we will repeat that in the round robin for the webinar after your comments.

MR. DEHMEL: All right. Thank you.

Yes, as a preface, again, I would like to reiterate that this information is presented in Section 4, starting on the sixth page of The Federal Register notice, and there's more information contained in the SECY paper 08-01-97. Enclosure 3 and 4 address the issues we are going to be talking about.

And the information presented today, as well as enclosure 3 and 4 of the SECY paper, will form the basis of a more extensive discussion that is going to be contained in the next SECY paper.

So, with that, we are going to go over the options with respect to revising the Appendix I design objectives.

So, as any rulemaking process or any consideration of changing or revising regulations, there is always the no change, you know, the status quo option, so to speak. So, one option is to leave the regulation the way it is because one is kind of a part of the rulemaking process.

But there's another element addressed to that having to do with the way the Appendix I requirements are identified in a regulation under

10 CFR 50.34a, which, in essence, says that the Appendix I criteria, the numerical guides and the design objectives and everything associated with that, are not to be meant to be a safety standard.

So, if it's not meant to be a safety standard, and we are trying to realign this with Part 20, the technical basis on the dosimetry concept, in this case, ICRP 103, a case could be made that the two are, in essence, a completely different regulatory requirement.

The case could be made that, as long as the Appendix I numerical guide objectives are met and the ALARA provisions are met of Part 50, Appendix I, then you have met the intent of the regulation. And the fact that we are using ICRP 2 criteria on dose calculation essentially is an artifact of the regulation, sure, but basically it is a guide.

It is essentially establishing some sort of guideline in determining whether or not additional equipment has been installed for the purpose of treating liquid and gaseous effluent releases and making sure that all releases are ALARA and the doses to the members of the public are ALARA and minimized to the practical extent.

So, whatever our guideline is, it could

remain under the ICRP 2 criteria or it could be upgraded to Part 20. So that is the first one.

The second one, 1b, the idea there would be to align the dose definition and quantities of Appendix I criteria with the ICRP recommendations, given a revision of 10 CFR Part 20. So, here, the objective would be to make that revision in Appendix I, the numerical guides, consistent with the dosimetry concept that would be adopted, incorporated in a revised Part 20.

So we could, in this case, we would have to wait and align this on essentially the basis of what we are going to ultimately do with Part 20. So you could see there could be an offset in time there, so to speak. We could be doing some work upfront with the realization that, whatever that alignment is with Part 20, we are just going to have to adopt it, essentially, the whole stock and barrel, and incorporate that under the basis of the ICRP 2, I'm sorry, Part 50, Appendix I, numerical guides.

Option 1c, recognize that perhaps the Commission may say, no, Part 20 is fine the way it is, and there's no need to revise Part 20 to ICRP 103, and therefore, Part 20 would remain under ICRP 20, 6930, dosimetry concepts. So, it would be, in essence, no

change to Part 20.

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

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

requirements would all remain as they are.

In considering option 1b, that would involve a major revision of the regulatory guidance, the computer codes, and the NUREGs, obviously, because everything would have to be normalized to ICRP 103 dosimetry concept, as revised and adopted in Part 20.

The same thing with option 1c, all the Reg Guides would have to be updated and computer codes be standardized to ICRP 20, 6930.

There was an advantage with going with 1b because, as you will recall, the way Regulatory Guide 1.19 is set up right now, it actually allocates the dose and considers doses for different age groups. There is an infant, the child, the teenager, and the adult.

So, if we go with ICRP 103, that information and those conversion factors were already provided in accordance with these different age groups. There's maybe some finetuning that could be done for the infant and the child, but that, essentially, should be a fairly simple process. But the point I am making is that the dose conversion factors are there.

If we were not to revise ICRP 103, we 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

point here is that we have got an audience out there in cyberspace that we want to make sure that we get their point of view discussed. So, although you are speaking from whatever background, also maybe speak from your concerns that you have heard from your background, so that we get a diverse set of ideas that informs Jean-Claude, so that he can take it and review that information to make the best decision.

This is not a decisionmaking panel. We are not asking you to conclude. We are just asking for you to discuss.

And since Ralph has been in the audience and on the panel before, we will start there, so we don't have to pick on you, Carolyn, to start a conversation.

So, Ralph, if you would just react to and give your opinions on those options, we would appreciate it.

How are you doing? Technical difficulties?

MR. ANDERSEN: We are live?

MR. HODGKINS: We are live.

MR. ANDERSEN: Good.

First of all, I would like you to consider adding a fourth option for the purpose of evaluation,

not necessarily because I think it would be a real popular option. I think the fourth option would be to update 10 CFR 50. It would be option 1b independent of 10 CFR Part 20.

So, I think you ought to add a 1d, especially as you proceed and as you would address this ultimately in a SECY paper to the Commission, to disposition the issue of updating Part 50, Appendix I, to ICRP 103, absent any change to Part 20. So, for completeness more than anything else.

Other than that, I think the general preference, as expressed from Monday as well, would be option 1b. There's a lot built into that, obviously, that would need to occur to arrive at that point. But there continues to be the interest to be able to use a current technical basis for what we do and, also, to have consistency between the regulations. So that would be the starting point as to why we would favor option 1b.

Additionally, there is that issue of international consistency as it plays out in licensing. Now the flip side of that, though, is, unlike Part 20, the implication of updating anything, so either option 1b or 1c or 1d, if you add that option, could be the impacts on the existing licensing

basis.

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

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

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

MR. ANDERSEN: Thank you. I was pretty good about that Monday. I forgot today. I apologize.

Ralph Andersen, Nuclear Energy Institute.

MR. HODGKINS: Thank you so much.

MR. SMITH: Okay. I'm William Smith with Southern Nuclear Company, Nuclear Development.

To echo some of the things Ralph said, since the current regulations provide adequate protection, then any change that we have in the Appendix I should be consistent with the changes that we would have for 10 CFR 20 related to ICRP 103. But, also, we should have the 40 CFR 190 change made consistent with that, so that we are all in harmony and talking on the same page.

MR. HODGKINS: Thank you.

MR. PEDERSEN: Roger Pedersen, NRC NRR.

Yes, I think my comments echo somewhat of Ralph's, since we both are interested in operating reactors.

NRR, obviously, is interested in consistency of the design basis of our operating reactors, and we have something called the backfit rule that we have to be concerned about as well.

A general comment I have is in terms of the overview here of which of these three, or possibly

four, options is the most desirable or the one that we should aim for.

It is somewhat dependent on the identified goal or benefit of making a change at all. I think we need to get a full understanding of what all not just the impacts of making a change, but what the benefits would be.

I have heard Ralph, although I think he has left the room now, in the past refer to the problem that was mentioned earlier of ICRP 2 concepts and dosimetry models aren't even taught anymore. So there is an impact with the current operating plants with the current status quo even. So there is some benefit to that. Then, there are other benefits.

So, we need to collect that whole bag of what are the benefits and the costs, and then go through this process of trying to identify the most desirable option, so we can put that in the SECY paper.

MR. HODGKINS: Thank you.

MR. LITTLETON: Good morning. Brian Littleton with the EPA.

I just want to, again, kind of say, well, we would probably prefer option 1b, aligning 10 CFR 50 with the ICRP 103 recommendations, and a potential

revision to 10 CFR 20.

We are, the EPA, dealing with a very similar issue when it comes to revising our standard to 40 CFR Part 190. The dosimetry in that standard has been outdated for a while. It was based upon ICRP Report No. 2, dosimetry.

And we are very interested, although we haven't made a final decision, but we are very interested in updating that portion of our standard. Some of the things that we are struggling with right now are in considering whether we want to revise it or not are, if we do revise it, what is our ability to move towards, let's say, ICRP 103, dosimetry, in lieu of the fact that there's still some minor details that need to be worked out for us to get there.

This is mostly a timing issue. Realize that the agency, we prefer to move to the most recent scientific and technically-available methodology, but there are some issues that do come up with moving to that methodology.

But kind of in looking at that, we do prefer to, I guess, kind of move towards option 1b, which I believe we think is optimal for both NRC and it would be optimal for us as well.

MR. HODGKINS: Thank you, Brian. You can

hold onto the mic.

So, this side has a mic you can share.

Larry, do you want to take it away?

MR. HAYNES: Larry Haynes, Duke Energy.

There is not a lot to add to what's already been said. I think I would add, though, from a practical standpoint, most utilities, particularly ones with plans to build new plants, would prefer that we totally align Part 20, Part 50, and ICRP 103, and working with EPA, for that alignment as well.

It just makes sense that we bring up ourselves to the current science that is available and that we at least at some point start on the same foot with training for new folks coming into the industry, and as we turn over our current plants to new folks, and the new plants to be built, that it just makes sense that we would have that alignment. And now would be the right time to try to make that approach, if we are going to do it.

MR. HODGKINS: Thank you.

MR. BOYD: Mike Boyd, EPA.

I would like to start out by saying that, in keeping with your groundrules, that Brian and I are offering are opinions because, of course, this is also a public process at EPA, and all these decisions are

yet to be made. But, given that, I agree that 1b, I think, is the ideal.

I also would like to say that there is a problem with the lawyers usually in terms of how to write a regulation that can be somewhat a living document that can reflect the latest science.

We, both NRC and EPA, have in various regulations actually codified things like tissue-weighting factors and radiation-weighting factors, and then our hands are tied. DOE has done the same.

To the extent that we could treat it more the way we regulate chemicals at EPA, where, as new risk information comes in, the risk coefficients can be updated through a very open, transparent process, but keep abreast of the latest science, if we were able to do that, in five or ten years, if the tissue-weighting factors were to change -- and I'm also cognizant of the burden this could put onto the regulated community, but you shouldn't have to do a rulemaking every time a tissue-weighting factor changes. So that's my opinion.

MR. HODGKINS: Thank you.

MR. ROACH: Good morning. I am Ed Roach, Branch Chief, Health Physics, New Reactors Office, and I have been working with Jean-Claude on this to

support the potential rulemaking for Part 20 and Part 50.

MR. HODGKINS: Ed, can I just interrupt?

MR. ROACH: Sure.

MR. HODGKINS: Again, webinar folks, if you can hold the mic right to your mouth, I would appreciate it.

MR. ROACH: Okay.

MR. HODGKINS: Yes, there you go. Karaoke time.

MR. ROACH: Anyway, my name is Ed Roach. I'm the Health Physics Branch Chief for the New Reactors Office. I have been working with Jean-Claude Dehmel on preparing the policy statements as this moves forward and supporting Don Cool in this endeavor.

From the perspective of the New Reactors Office, it would nice to step out on the right foot with everything aligned. However, what we prepare are options for the Commission to give them a chance to evaluate practical cost and all the other implications.

So, ICRP 103 is the best new science. That leads us to 1b, if I had a personal preference.

MR. HODGKINS: Thanks, Ed.

Carolyn, do you think you've got the hang of it?

MS. HILL: I think so.

MR. HODGKINS: All right. Go ahead.

MS. HILL: Carolyn Hill, S.M. Stoller Corporation.

I think, in general, I would agree with everything that has been said. From an outsider's perspective, Appendix I is now with 103, I guess, four iterations behind on the scientific basis. So, definitely the argument has been made for the public, but it would be beneficial to update.

Again, speaking from an outsider's perspective, please correct me if I am making any assumptions that are too broad or anything. But it seems that it would be easier for the licensees to update their regulations in one fell swoop to align with the Part 20 changes and the Appendix I changes, if both were aligned with 103. So, I think, again, 1b would be the preference from our standpoint.

But, also, I had a question. I didn't know if this has been discussed in the past few days, the timeline for rolling out the Part 20 changes and the Appendix I changes.

It also seems that maybe the Appendix I

changes wouldn't be as great of an impact on the licensee as the Part 20 changes, and that the NRC, with the associated Regulatory Guides with Part 50, might have more of a larger effort there. I don't know, but maybe to go along with Ralph's fourth option, if it is possible to roll out the Appendix I changes first, and then have licensees follow with the Part 20 changes, because it seems like that would be a greater impact to that.

MR. HODGKINS: Okay. Thanks so much.

Jean-Claude, do you want to add anything to that?

MR. DEHMEL: Yes, I want to add one more item. I go back to the first option 1a with respect to I would like to revisit this and talk about the fact that, again, the purpose of revising Part 20 has to do with, first and foremost, the fact that it deals with doses, and it is a safety standard, doses to workers and doses to members of the public.

Again, you kind of explore the issue of the fact that Part 50, Appendix I, is clearly identified in 50.34a, that is not a safety standard. Now, given that reinforcement or reiteration, does that change any of the viewpoints here?

MR. HODGKINS: How about let's just go

around and get a yes or a no.

Ralph?

MR. ANDERSEN: No.

MR. HODGKINS: No. Ralph says no.

William?

Oh, wait a second.

Can you repeat the question, Jean-Claude?

MR. DEHMEL: Yes. I just want to go revisit option 1a with respect to that, in recognizing that 50.34a specifically states that the Appendix I numerical criteria and compliance with ALARA portion or elements or provisions of Part 50, Appendix I, are, in essence, not a safety standard. Now, given that and in light of what you just heard again, do you still essentially maintain that we should revise Part 50, Appendix I, to ICRP 103 under option 1b?

MR. SMITH: In that case, I would say no. Why are we changing it?

MR. PEDERSEN: I think it goes back to my question of, what are the benefits and what's our stated goal here? I agree with you, Jean-Claude, we don't have a safety issue here in the way we are currently regulating plants and using the current version of Appendix I. So there's no safety reason, particularly since, as you point out, this is not a

safety standard; it is a design criteria.

But I'm not sure that is the major benefit that might be gained by making a change. So I don't think that is the only issue that we are going to be talking about today.

MR. HODGKINS: Brian?

MR. LITTLETON: This is Brian Littleton, EPA.

I guess I would question, I guess, whether it doesn't have portions of a safety standard. Now the changes may not be changes related to or that are driven by safety, but I think that Appendix I does have portions that talk about, I guess, dose to both the worker and individuals, public individuals, that it is kind of interwoven in there. So that's my question.

MR. DEHMEL: Well, to answer your question, it is that the doses, or the numerical criteria are, in essence, kind of a guide, and it is introduced in Part 50 of Appendix I; it is a guide. A decision was made back in 1975 that the doses associated with effluent releases from nuclear power plants should be a small fraction of background. So, basically, based on that, the decisions that were made then for liquid effluents is 3 millirem to the whole

body; for gaseous effluent, it is 5 millirem to the whole body.

So, if you look at that, you talk about exposure, doses are a small fraction of background. The industry has essentially been able to meet the Appendix I numerical guides without any problem. And the fact that we are referencing, we are using this bright line, we are expressing doses as a measure of compliance with the numerical guides, as well as for the purpose of demonstrating compliance with the ALARA requirement, provisional Section 2d, we could use any other standard. We could be using release rate, right, total curies per year, curies per second, and so on. So we could be using another measure.

Now some within the staff, as well as within the industry, might say, well, ALARA, if you look at the provisions identified in Part 20, this applies to all applicants and all licensing. Section 1101b has, essentially, a provision in it that says all operation, all effluent releases should be essentially ALARA.

So, there is an implication that, if you are to reach out in Part 20, that section says, well, the ALARA implication of Part 20 implies safety, even though the ALARA implication in Part 50, Appendix I,

is truly a numerical guide to determine whether or not have effluent releases been treated such that you can meet the numerical criteria of Part 50, Appendix I.

While the ALARA criteria in Part 20 tend to focus on reducing releases for the purpose of minimizing doses, and that could be interpreted, well, that is really safety; the intent there is really safety.

So that is what I am trying to tease out from all the panel members to see whether or not, if you think about this and go to these different requirements, go back to what happened in 1975, when Appendix I was issued, can we release -- it is, indeed, a non-safety standard. The guides are, in essence, artificial. In 1975, we said it should be a small fraction of background and essentially retained that approach, and then just change the methodology or leave it the way it is because it has no connection to safety.

MR. HODGKINS: Did you want to react to that, Brian?

MR. LITTLETON: Yes. Just, I guess, I'm providing you some input that we have received from our public stakeholders, our environmental groups that we have spoken with, regarding any changes that we may

have for our standard. I think the same kind of impression might apply here as well, although I'm not pushing it.

The input that we have gotten from our environmental groups is, once you have a standard on the books, they look at anything, any changes, as, okay, have we stepped back and is it less protective? And so, it might be there may be some that don't understand that there are aspects of this Appendix I that are not safety-related and they would take a look at it and say, well, you know, the NRC made a determination at some point that this was the safest standard that could be adopted. Any back-step from that might be, I guess, a less stringent standard.

So you might want to consider that viewpoint as you go down this. It is not anything that the agency is necessarily pushing. So, this is not, I guess, a comment from the EPA, more so just as a cautionary note based upon what we hear from the public on some of our standards.

MR. DEHMEL: Thank you.

MR. HODGKINS: Hold on a minute. I'm going to steal one of these mics.

Ralph, you wanted to add, I think?

MR. ANDERSEN: Ralph Andersen, Nuclear

Energy Institute.

I guess I will elaborate on my first round here. What comes to mind is, if it walks like a duck, quacks like a duck, and acts like a duck, that might apply here.

In the revision to Part 20 in 1990, the NRC rationalized assurance of meeting the 40 CFR 190 criteria of EPA's standard, which is, in fact, a requirement in Part 20, so that raises an interesting question about whether that is a safety standard or not. The rationalization was that the Appendix I criteria assure that the 40 CFR 190 standard will be met. So, in effect, NRC updated and revised its basis for the Appendix I criteria in a rulemaking. So that needs to be taken into account.

I would still argue that Appendix I is not a safety standard, but I would just say the lines got blurred considerably with the way in which NRC updated Part 20 previously and rationalized the requirement specifically for meeting the 40 CFR 190 criteria.

Since then, also, we have pulled the Appendix I criteria into the regulatory oversight program, where it is now a performance indicator in the ROP, which can create regulatory response, if one exceeds that. And we have brought the essence of it

into the space of NRC enforcement.

So I just want to comment that, notwithstanding the original basis for the Appendix I criteria, their use in regulation has changed over the years and simply blurred the line. I still agree with your point, Jean-Claude, but I think that has become blurred.

And then, finally, I would just make the same point that Brian made. Our own experience with our public over and over and over again is they view the Appendix criteria as limits that we are committed to meet. But that's just the way they understand them, not as guidelines. Even though, technically speaking, if we exceed one of those, we are simply in a corrective action venue and a reporting venue, they, nevertheless, have communicated repeatedly the expectation that we will, in fact, meet those criteria, not just try to meet them.

MR. HODGKINS: Jean-Claude, we are going around the room and ended at Brian with your initial question. And as this is above my head, are we at the point where we still need to go around with Larry and get his reaction from your original question?

And, Larry, do you need him to repeat it? Okay.

MR. HAYNES: Is it on now?

MR. HODGKINS: It's on.

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

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

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

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

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

bore with it. But piecemeal, particularly if EPA is not going to go along with that, we really aren't going to get what we need and where we want to be at the end of the day.

MR. BOYD: Mike Boyd, EPA.

And thanks, Larry. I hope you are going to be one of those stakeholders supporting us when we try to do that move forward to change our regulations.

I think this is not a question of a changing standard as much as just translating it. I think the ALARA guidelines seem to have worked well. The offsite doses seem to be quite low. From my point of view, it is just getting rid of having to train workers and managers how to use ICRP 2. Whatever the number is in ICRP 2, what would be the equivalent effective dose, and go with that. Don't change anything about the design basis at all. Just change the way you calculate the number.

MR. HODGKINS: Thank you, Michael.

Ed, let's give you a microphone. I'll pass it.

MR. ROACH: This is Ed Roach again, Health Physics Branch, New Reactors.

Recognizing, as several people have, that it is not a true safety standard, it has become a de

facto standard for implementation. I believe that, if it were to stay the same, but the underpinnings were to comply with ICRP 103, it would probably align us well with the international community, which we are somewhat skewed at this point. So I don't see that as a major failing for us or an issue at this time.

MR. HODGKINS: Thank you, Ed.

Carolyn?

MS. HILL: I have nothing to add.

MR. HODGKINS: Are you going to pass?

Okay. As far as, then, Jean-Claude, do you want to react to that reaction? Is that the information you needed?

MR. DEHMEL: Yes. I just wanted to get some additional feedback from the panel members. We can go through the question section now.

MR. HODGKINS: Okay. And how about, is this a time that you want to go to the audience, Don?

DR. COOL: Thank you.

Don Cool, NRC.

I think there's a couple of things for the NRC staff's record that we used to develop a regulatory basis in our recommendations for the Commission that we need to check on.

And the question that I would like to toss

out, as people were discussing a few minutes ago, how Appendix I is now actually functioning, notwithstanding its original role as design objectives, not a safety standard. There was some discussion about how the NRC had put in 40 CFR 190, and there had to be compliance with that requirement. And in fact, there is the more generalized statement that nothing within that rule, 10 CFR Part 20, relieves a licensee from any other legal obligations of other regulations, the EPA 40 CFR 190 being only one of them that also happens to be called out.

I actually wanted to get a little bit of reaction from our two EPA colleagues because the other thing that keeps circling in the back of my mind from the history back 10 years or so ago was that Part 50, Appendix I, was a critical piece in EPA's ability to say that there did not need to be any other regulatory requirements on the reactor side of the house under the Clean Air Act and effluents, which is one of the components that Part 50, Appendix I, deals with.

And whether, as a basis for what we are looking at, we also need to consider the relationship of other EPA regulatory requirements beyond 40 CFR 190, and the relationship between those two in making sure that we continue to have an alignment and we

don't, unintended consequence, get into a position where we no longer have a basis, a firm legal basis, to avoid duplicative regulation under some one of the acts which EPA must administer, which is not an act which gives the NRC any legal authority.

So I would be interested to see if Brian and Mike want to help my memory and help our record develop how that plays into this, and the extent to which updating the underlying basis would be impacted, if there would be an unintended consequences.

Thank you.

MR. BOYD: I think you're talking about, when EPA, I guess we rescinded Subpart I or deferred enforcement to NRC. I think that the limit under the Clean Act for gaseous effluents was 10 millirem per year, and NRC demonstrated that, even though that was quite a bit below your facility limit, that none of your licensees or power reactor licensees were coming close to meeting that. And I believe there is just a Memorandum of Understanding or something, something along those lines, where we consult, if that ever were to become a problem.

But, so far as I'm aware, changing Appendix I criteria just to make it in terms of 103 dosimetry shouldn't have any effect on those decisions

related to the Clean Air Act.

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

MR. LITTLETON: Yes, this issue came up with we have a requirement, 40 CFR Part 61, Subpart I, which is our national emissions standard for hazardous air pollutants for radionuclides, that this issue came up.

I think my memory is not that good of it. I'm relatively young.

(Laughter.)

But, if what I remember when I was younger still applies, the issue was whether, I guess, the agency should continue to enforce this requirement on the books, this Subpart I requirement of 10 millirem per year from hazardous air emissions, the radionuclide emissions, or whether we could, I guess, defer to the Nuclear Regulatory Commission because their requirements were as stringent as the agency's requirement.

And I think the analysis that was done, and although I don't know this, did look at this 10 CFR Part 50, Subpart I, the criteria here, and then, based upon an analysis of this, of the requirements here, the agency was able to say that, yes, the

requirements that the NRC has are at least as stringent as EPA's NESHAP requirement; therefore, we can allow the NRC to enforce their requirements, and our standard will be met.

So that's kind of a quick, and I don't have a lot of details about that, but my quick memory of the issue.

I guess I would say that, regarding that, I think that maybe part of if a revision is done to 10 CFR 50, it could easily be codified during the process that, yes, any revisions that are made to 10 CFR 50, that they do still meet the original intent of EPA's 40 CFR 61, Subpart I, requirements.

So, I think it can be done. I don't want to dismiss it, but it is something that can be handled.

MR. HODGKINS: Ralph?

MR. ANDERSEN: Ralph Andersen, Nuclear Energy Institute.

Given that that was about 16 years ago, my memory is a little bit hazy, too. I have lost more brain cells than Brian has since then.

(Laughter.)

But I was the industry lead, and it was through a rulemaking, by the way. It wasn't a

Memorandum of Understanding. It actually was a formal rulemaking by EPA.

And the basis for the deferral to the NRC was, in fact, the Appendix I criteria explicitly. And one artifact of that, interestingly enough, thinking about yesterday's conversations, that was precisely what caused the NRC to have to promulgate a constraint for other licensees of 10 millirem per year. Because the EPA was satisfied, once they had thoroughly reviewed how NRC applies Appendix I to its reactor licensees, and became completely satisfied for that; they still had great reservations about the remainder of NRC-licensed facilities.

So, it was for that reason only that NRC promulgated the 10-millirem-per-year dose constraint in Part 20 for other licensees. That allowed EPA, then, to defer all NRC licensees to the NRC under NESHAP.

So, indeed, Don, the point you raise, if such a rulemaking was undertaken, to me, it would be unavoidable that NRC would need to consult with EPA to consider whether EPA may need to actually take an action concurrently to renew the deferral.

Legally, this is lawyers' space on EPA and the NRC side, and who knows how lawyers might view it?

But there is a legal connection between Appendix I and Subpart 61 for that reason, because it was done through a rulemaking.

MR. HODGKINS: Thank you, Ralph.

Do we want to open it up to the audience at this point? Or do you want further discussion, Don, Jean-Claude? Shall we open it up to the audience just to react?

DR. COOL: Sure.

MR. HODGKINS: Let's do that, as far as, are there any comments from the audience? I see microphone 2 first, and then microphone 1.

And this is the time for our webinar participants to type in their questions. Right now, there are none.

MR. MECK: Thank you.

My name is Robert Meck, and I'm representing Science and Technology Systems.

It was mentioned early that AREVA had made some calculations and there were apparent discrepancies. Can the NRC staff give us the source of that, so that we could take a look at those calculations? Is this public information?

MR. DEHMEL: Jean-Claude Dehmel, NRC.

No, we do not have that information. That

information was obtained during what was called a quality assurance audit of the submittal, the FSAR submittal, before it was formally submitted to the NRC. And we had discussion with their staff at that particular time.

So, in the context of our review of the pre-submittal of the FSAR, we had looked at some of the results for Appendix I calculations and compliance with Appendix I requirements for both liquid and gaseous effluents.

In the course of the discussion, we were told that the American team had taken the European design and essentially scrubbed it through the Part 50 licensing process, and in doing so, they came up with doses, obviously, using the NRC guidance, the Regulatory Guides, the SRP, and the computer codes.

As part of an internal check within AREVA, they essentially sent information back to their French health physicists, who looked at it, and they were somewhat dumbfounded that the results would be so high. And the French team thought that there had been a dramatic error made somewhere on the part of the American team.

So, the American team was able to fully explain to their French counterpart that the process

in Appendix I, the use of the guidance, the Reg Guide, the SRP, is such that it instills a certain degree of conservatism that essentially is not applied in Europe; plus, we are still, again, using ICRP 2 dose conversion factors. So, taking these two factors into play resulted in apparent doses, still in compliance with Part 50, Appendix I, and Part 20 on concentration limits, given that, and results that are comparably higher than the similar calculations done in Europe for the licensing of those plants in European countries.

MR. MECK: Would any of this specific information be in ADAMS documents?

MR. DEHMEL: No, this information is not. It's not in ADAMS. It was not submitted to us.

We did ask for some specifics because, at that time, we had already written SECY-08-01-97, and we thought that would be useful information for us to actually show a difference between an identical design licensing there versus the same plant licensed in the United States, to show the delta, the differences, and relate that to this global licensing of a nuclear power plant, but we were not given that information.

MR. MECK: All right, I have a followup. There are significant intangible benefits for updating

this. It was questioned, what are the benefits? Things that come to mind is the status of national and technological and scientific position of the United States in the world. It has been clear in the media and other tests that the United States is not as expert as it used to be. And it is my professional opinion that this Appendix I situation could be a poster example of some of those things, of how we have fallen back.

And in addition, in terms of public confidence, that is another intangible benefit that could be improved with the improvements. And thirdly, the alignment with international scientific practice and technical practice.

These are significant intangible benefits that I urge the staff to emphasize in their communication with the Commission, when you write your paper.

MR. HODGKINS: Is there another followup?

MR. MECK: Yes. I would like to make a point that, throughout these three days, there have been assertions that there was adequate protection. But to a scientific and technical person, assertions don't get you very far, and I have yet to see it demonstrated on a radionuclide-by-radionuclide basis

that these assertions can be supported with technical facts. And I urge the Commission to demonstrate this. And that's why I was asking for the data in the first place.

Thank you very much.

MR. HODGKINS: Thank you.

Microphone 1?

MR. DAVIDSON: Hi. It is Scott Davidson with New World Environmental.

My comments were going to be very similar to Dr. Meck. Having written them down, I can read.

Do we know or strongly believe that, if Appendix I and 40 CFR 190, et cetera, were all harmonized with the ICRP guidance, and we do the math correctly, will it cause reactor effluents to go down for the current plants? And if that answer is no, then this is an exercise, intangible exercise, or exercise to promote math and science, and will not cause reactor effluents to go down.

So, what would be the justification? If we haven't done that exercise, a sensitivity analysis or something, then I don't know how we proceed on this. Do we know that reactor effluents have to go down to meet the new standards?

MR. HODGKINS: Okay. Thank you.

As far as panelists, any reaction from any of the information that you just got?

And then, you were wanting microphone 2? Okay, let's go for the panelists first.

MR. ANDERSEN: Ralph Andersen, Nuclear Energy Institute.

In response to the last point, the fact is that we operate at small fractions of the Appendix I criteria. There's a very large margin. That is true, really, with any limit that we deal with. We don't operate at limits. That is the first thing.

The second thing is that it is unlikely, although, as you say, you could do the math, but it is unlikely, then, any conceivable change to the standards would actually change nuclear power plant operations. In many cases, we are at less than 1 percent of the criteria. So there's several orders of magnitude margin.

Secondly, the issue of public confidence, I just wanted to mention that an issue that was raised with the NRC in the late nineties is the transition between the Appendix I criteria and the protective action guidelines. The protective action guidelines are cast in, at least at that time were cast, in ICRP 26 and 30 space, and you actually had an interesting

transition.

Typically, you declare a site area emergency when you exceed the tech spec value, technical specification values, by a factor of 10. In fact, those technical specification values are the Appendix I criteria.

Then, you are required at that point to consider onsite actions and to consider whether you maybe should take precautionary public protective actions. And the very first thing that you have to do, then, is do a dose estimate of public dose from the emerging events at the plant. And the dose estimate that got you into that condition was done under ICRP 2. And when you repeat that same calculation using ICRP 26 and 30 with the particular nuclides we deal with at nuclear power plants, suddenly, you find that you haven't met that condition.

So, you call everybody back and say, "Oops, no, I'm not there." And then, when you fall back to the previous level, then you recalculate using ICRP 2, and you'll say, "Nope, I am in that condition." And basically it's a DO loop that puts you back and forth, and we saw that as a significant public confidence issue at the time.

NRC opted not to take action, even though we spent a lot of time discussing this. They recognized that artifact. So no specific action was taken. But that would be another example of a benefit to resolving a common methodology.

Help me out, EPA, but I think the emergency preparedness stuff now is actually cast in ICRP 60 space, but I am not totally sure about that.

MR. BOYD: Of course, we haven't issued the new PAGs. The draft that has been circulated is in ICRP 60.

MR. HODGKINS: Thank you.

Roger, did you want to add to the conversation?

MR. PEDERSEN: Yes, I didn't want to disrupt this thread that was going on, which was very interesting.

Yes, something that came to mind when Jean-Claude first pointed out that Appendix I is not, and is clearly stated is not a safety standard, we need to keep in mind that Appendix I actually is multifaceted, not just in its implications on how we interact with EPA, but within our own NRC purview.

And that's reflected in the title of Appendix I, actually. It is design criteria for the

review of new plants, new radwaste system designs for new reactors that are being licensed. And then, those same criteria are applied as limiting conditions of operation for the operating plants.

So, as we go through this, we need to keep in mind what aspect of Part 50, Appendix I, we are actually referring to. We have jumped back and forth a little bit.

And when you get into providing limiting condition of operations, which are in the technical specifications, which are basically a safe-operating envelope for a plant, that also blurs that line between what is a safety standard and what is a design criteria. And that is why we get into those discussions.

MR. HODGKINS: Thank you.

You know what? Brian, did you want to add to the conversation as far as jumping around? I don't want to jump around, but we did. So, let's go back to you.

MR. LITTLETON: Brian Littleton with the EPA.

I think that I guess, regarding whether any potential changes if we revise the dosimetry will make a difference in the safety of a plant, I think

that what may happen is, whether it makes changes in how the plant is operated or not, it could provide a lot as far as public confidence goes.

Generally, there are a few, I guess, parameters that the agency uses in our analysis of effluents from nuclear power plants that are just a little bit different from some of the NRC's. But if the public wants for us to run our analysis using our numbers, just to see where they end up, I think that is a useful exercise.

MR. HODGKINS: Thank you.

We are going to go to the microphone now, No. 2.

MR. SCHAFFER: I'm Steven Schaffer. I am a health physicist with the NRC.

Speaking for NRO, with every license application, NRO's analysis does include a recalculation of the doses using the ICRP 60 methodology, and we do make the comparisons. We keep those comparisons in our back pocket, whether or not we are asked about it. And in all cases, the conclusions still remain the same, that the applicants can comply with Appendix I.

MR. HODGKINS: Thank you.

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

Chesapeake Nuclear Services.

I think a lot of good points have been made. I think I will go back to where the industry currently is in Appendix I with the many years.

It is pretty much a self-regulating industry at this standpoint. I don't think that we have seen any issues of compliance with Appendix I and the design objectives since the seventies.

And that case is, if you look at the regulations, it really is -- and I think Mike's got a good point -- EPA's position, which is to provide flexibility in the application is important. I think there is a real need to allow flexibility in the regulations.

We use regulations to establish dose standards, dose criteria, and in this case design objectives. But, then, in the implementation, to be able to use the best available technology and science in evaluating compliance would really go a long way.

Public confidence is a key item in this issue. We find ourselves where we are very prescriptive in the dose calculational methods, to where the industry now is presenting calculated doses which are orders of magnitude greater than actual doses.

And we have a tendency, then, to use these dose numbers that are presented that are basically bad science. The doses are based upon dosimetric data which failed to recognize that there are dose coefficients for certain radionuclides and certain organs that are not being evaluated. The pathways assessed are overly conservative.

So, in general, the numbers that we have out there are overly conservative. Then, they also, because they are not based upon what is really up-to-date dosimetry, they lack an element or could pose a public confidence level, to where we see issues of radionuclides, and we have recently seen it in the carbon-14 issue, to where now that has become a radionuclide of importance. However, over the past years, we have not been assessing the doses. I will even contend that the methods that we have in place will do an adequate assessment of actual doses from carbon-14. So, we need to allow flexibility in the implementation methods.

If you also look at Appendix I from a cost/benefit-type standpoint, I don't think that you will find any reactors that have had to add waste processing systems in order to meet the cost/benefit requirement. So you can see improvements in the

regulations to simplify some of the processes as well.

I will conclude with one item, which is back to the item of you can almost separate a compliance-type assessment, very similar to what we have in Part 20, where you have DACs and ALIs that can be used from a compliance standpoint to demonstrate we are in compliance. Should those be used as a dose assessment? No. They really are not a good technical basis for doing an individual dose assessment. However, they are a very useful tool for showing we are in compliance.

Likewise, with Appendix I, you can develop a very simple compliance assessment, but separate from that the ability, then, to do an actual dose assessment.

MR. HODGKINS: Thank you.

So, two folks from the audience. Is there some panel reaction? Jean-Claude?

MR. DEHMEL: Yes. Jean-Claude Dehmel, NRC NRO.

I want to just add a point to what was made by the gentleman over there.

What is your first name again? What was your name?

MR. DAVIDSON: Scott.

MR. DEHMEL: Scott.

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

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

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

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

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

MR. DAVIDSON: Right. That's great, but if you have this cost to the licensees and it doesn't result in less going into the environment, then you haven't changed the dose, regardless of how you calculate it. Okay? So that doesn't do anything environmentally.

Now I don't think you need to do anything. But what is happening, then, is you are improving the science. And do you need to legislate science improvements?

I mean I understand why you do it, for uniformity for the benefit of the people who review applications and have to defend why does this licensee do it this way versus this one? And it's more work. Okay?

So, let's choose how we want to do our work. Do we want to have it as a unified approach that everybody is going to nod their heads and follow or do we leave it up to the licensed entities to say, "We think we're better off with 50 different things because each of our locations has different pathway factors or populations," or something?

If we say it has to be through Reg Guide 1.109, Version/Revision what -- I don't know -- so be it. But that's where it belongs, in guidance. You

can legislate using best technology, and you already have the best technology. But is the best technology the science or the technology that reduces the effluent? Like I say, now you are in this circular thing.

You have two independent things running here. One I think is dead in the water because I don't think you will have any reduction in effluents. You will get the better science. How you get there doesn't need to be the legislative. Or should the industry be allowed to dictate that process? Because they are the ones who will have to demonstrate it.

MR. HODGKINS: Thank you.

Don, did you want to --

DR. COOL: Yes, thank you.

Don Cool with the NRC staff.

This is a very interesting point of discussion. It is, in fact, part of the reason that the NRC staff is looking for some of this input, because it could be viewed that updating the science is not changing any of the actual effluents. And therefore, a strict decision, which is if you are not going to change performance, there's no reason to change the regulation question, it is a very logical question.

On the other hand, the NRC, and I believe most federal agencies under the Administrative Procedure Act, and certainly the NRC under our requirements and under the requirements to do an analysis that is called backfit, looking at how the regulations are used and what changes are made, can also look at some other factors that would be associated with the regulations and guidance.

And if, in fact, there would appear to be some compelling arguments that doing an updated scientific approach is a more appropriate approach for an analysis, in order to decide whether or not some changes were necessary in performance or operation or analysis of a system that wanted to go in the place for effluent control, in fact, I think it would be necessary to have that methodology established in a regulatory structure, so that everyone understood what the requirement was, what models were necessary in order to be used in order to do a demonstration.

I think Jean-Claude has pointed out that the NRC staff has been challenged not necessarily on the basis that the applicant hadn't made a demonstration of safety, but, rather, that that demonstration of safety wasn't based on methodologies that some people were either more familiar with or

more confident of because it represented more recent information.

So, the NRC staff is looking today to build the record associated with, what are the benefits and impacts -- and we are going to go to the questions -- the benefits and impacts of updating this technical basis, which if you have in regulation, then gives the NRC staff the basis to change some things in guidance and the basis upon which to request applicants to do a calculation, so that there can be a consistency in how people look at it.

Only at that point, if you are using the same approach to things, can you, in fact, have a discussion of whether or not you agree or disagree that some additional action or activity is necessary, or if the proposal being made or the effluents being released from a particular facility are, in fact, where you would want them to be.

So I say that little soliloquy to point out that we need to have an understanding not just of "adequate protection" -- put that in quotes -- which is the basis of the NRC requirements, but, also, a clear understanding of the process by which we all articulate the extent to which we all know that that 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.)

MR. HODGKINS: Welcome back to our webinar participants.

We will start once again.

Have there been any questions from the webinar participants at this point?

Just a reminder to those folks that are on the webinar to please type in your questions. There will not be a telephone call-in portion. It has been too difficult to manage that with the sound.

So, if you will please write in any questions or comments that you would make, and then we will go ahead and read them at the microphone for your point.

During the break, too, Ralph, you were usurped. You are not going to be able to make the first comment.

And at microphone 2 we have an historical perspective that I think we are going to listen to.

(Laughter.)

And as the cacophony of laughter started, I got a sense that this guy is a very serious person.

All right. So, microphone 2, can you introduce yourself?

MR. CONGEL: Yes. My name is Frank Congel. I'm affiliated with Argonne National Lab

right. I was, I'm certain that most of you know, a staff member with the NRC for quite a while.

And I can give an historical perspective because I had an intimate involvement with implementing Appendix I to Part 50 and I actually wrote some of the text that is in the regulation.

What I wanted to do, and I know the focus of this meeting is updating of dose parameters, making certain that we do the best science and what the effects are. But I really want to, at least when it comes to Appendix I, talk about how it evolved.

You notice that we talk pretty much exclusively in the old days about thyroid dose, which, of course, related to iodine releases and then what was called total body at the time, which is principally associated with the noble gases.

The first test that was done to an essentially accepted design after it was proposed for a specific site was to see if that design could meet all of the Appendix I requirements at the site during its operational lifetime.

In order to determine that, the staff started with an assessment of what they thought would be expected radionuclide releases into the primary coolant with the associated cleanup capabilities, and

then, subsequently, releases to the environment. Those releases into the environment were called source terms. The source terms reflected staff's best judgment, conservative -- conservative means probably underestimating true capabilities to treat prior to release.

You looked at, in addition to the release into the environment, what the potential dispersion via both liquids as well as by the atmosphere to the site boundary. So, five to ten years' worth of meteorological data were gathered, evaluated, and dispersion factors to each point offsite were determined.

Thirdly, then, the calculations of dose. The dose was a surrogate. It wasn't a dose to a real person. A site point was picked beyond the site boundary that would expect to have the maximum dose, and, essentially, the radwaste system, as accepted in the design, was evaluated to see if the staff's best estimate was that that plant design could exist at that site and meet the standards. That is the ALARA.

But the dose was a surrogate. So, consequently, the discussions around the table here about ICRP 60, 59, and 103 in many respects, from my perspective, are not really relevant.

And a proposal that I would make is look at even the statement of considerations at the time, and you will find that that was the method that was followed by the staff. So we can concentrate on dose factors, ALIs, whatever, but the ultimate dose or number that was associated both total body and thyroid dose were really the end result of the staff sequence of analyses, all of which were conservative. And what I mean by that, even the meteorology was done in such a way that you would expect minimum dispersion at this one site over some time period.

So, one of the things, again, that we should do is another option would say update Appendix I to Part 50; leave out dose. Because to do this very rigorously totally ignores the meteorology calculations. Was that done accurately by today's standards? I mean I am certain that what we did 30 years ago to come up with the chi over qi's is certainly not what is followed today.

We also know a lot more about source terms today. We used to assume fail in fuel with leaking at a tenth of a percent. That hasn't been the operating experience at all, but that is what is reflected in those Appendix I numbers that we have on the record.

So, consequently, the first proposal:

reevaluate Appendix I and whether dose should even be used prior to going down the path of the best and accurate way to calculate dose, when dose wasn't even the ultimate purpose for Appendix I. I think it is very fundamental and a very important question.

Secondly, when it comes to NEPA, we then did similar calculations to characterize what the long-term impact would be from their plant operation. We assumed it would be 40 years.

So, again, source term, chi over q's, and then estimates of doses offsite, population centers, site boundary, and so on, now those values would be amenable to updating for future plants. However, to characterize what the impact would be over the long-term I still think is valid to account for the uncertainty that we knew was inherent in our approach, because we thought it was conservative, it would overestimate, but we really didn't know. My gosh, we were doing this in the early seventies.

We had what was a very comprehensive offsite monitoring program. This was to back up, what we said on paper, it was for impacts. My understanding after reviewing years' worth of environmental data, that the environmental effects offsite, buildup in the grounds, crops, water, were

nowhere near what we had estimated to be the case for NEPA purposes. So, we felt we had very safely and very reasonably characterized what would happen.

But I'm getting off a little bit. The fundamental point, instead of spending time about ICRP 103, 60, and so on, and Appendix I, my recommendation is back off, look at what you have to do in order to assure compliance with the regulation itself, which has the four parts, and don't use dose in any way as a surrogate to ensure that the design is compatible with the site.

That would eliminate a lot of the discussion. Then, at least, you can move on to the other part of the regulation that truly had an expectation of the best science to do the calculation.

Appendix I, NEPA calculations, they were the best we could do at the time, but when it comes to that site boundary dose, I would put "dose" in quotation marks because we could have picked a series of different parameters, ionization at that point, estimated -- a number of things.

But I think listening here, and I apologize I missed the early part of the meeting because I had another meeting, that it probably would get you into a corner by trying to do this supposedly

more accurately in the dose field, when the other two critical parameters that go into this are not being addressed: estimate of source term, estimate of offsite dispersion.

MR. HODGKINS: Thank you very much.

So, Ralph, you're next. All right.

MR. ANDERSEN: Ralph Andersen, Nuclear Energy Institute.

My comments weren't intended to address Frank's comments. Rather, they were intended to address some of the earlier points that were made, particularly on the issue of updating regulations driven by scientific updates, which was an interesting topic of discussion for some time, particularly led by Commissioner McGaffigan.

So, I would point out there was actually some very good documented discussions at the Commission level during the time that Commissioner McGaffigan was there that were on that very topic, about whether regulations should be updated per se to follow the science.

I want to reinforce Scott's comment. I don't see science as a driver for updating regulations. What I see is that the update in the ICRP recommendations, which is reflective of an update

in the science, as an opportunity to address other issues.

These issues are more related to the burdens that are imposed by hanging onto to the ICRP 2 methodology, among which and one that we have highlighted several times is the inconsistency with other parts of the regulation that we have to comply with, which requires that we sort of carry two sets of books.

Secondly is, in the current NRC licensing space, not only the applicants, but also the staff has told us they have got to carry two sets of books for defense-in-depth with their reviewers and their critics.

Additionally, we have multiple criteria that we need to demonstrate compliance with as an artifact specifically of using ICRP 2 as opposed to using ICRP 26, 60, or 103. All of those integrate internal and external dose, so that you don't have to carry all these separate criteria, including highlighted criteria like iodine and noble gases and other things. So, there's a lot of opportunity for improving the efficiency in demonstrating compliance as well.

Those are the drivers for the industry.

Otherwise, we would have been much more vehement at the time of the change of Part 20 previously. But, over time, those burdens have played out.

The final point Don made is that we now actually have the unique issue where graduate students in health physics that come to work for us have to be trained on this arcane methodology, so that they can do their job. They don't necessarily come equipped with that full knowledge of ICRP 2 with their education. So, that additionally imposes a burden, and it also opens the opportunity for error.

So, from a human factors point of view, this also isn't a good thing. Ultimately, it led to one of the landers on one of the planets, I guess the moon, crashing into the moon.

So, there's a variety of reasons why we are supportive of updating. But, again, I just want to stress that the science itself is the opportunity, not the driver.

MR. HODGKINS: Okay. We will move to the questions then. And I see that we are at Question 1-2 because we pretty much handled Question 1.1.

Yes?

MR. DEHMEL: Yes, that is correct.

MR. HODGKINS: Okay.

MR. DEHMEL: We went around; we had a roundtable discussion and questions on that issue. So, Question 1-1 we have covered already. So, now we are looking at two questions, 1-2 and 1-3.

MR. HODGKINS: Okay. And so, you guys can read, but for the sake of the webinar participants, too, although they have this same slide up on their thing, on their screen:

"What is the scope of operational impacts and costs in updating programs and procedures given a revision of 10 CFR Part 50, Appendix I, design objectives and NRC guidance?

"Please identify specific types of impacts that the NRC should consider in implementing a revision of 10 CFR Part 50, Appendix 1" (sic) "design objectives and NRC guidance to ICRP Publication 103 recommendations."

Carolyn, is there anything that you would like to add to that discussion?

MS. HILL: I don't think I really have anything I can add right here. I don't really have a good grasp on how it would impact the programs, rather than very general, of course, it's going to impact procedures and training and things like that.

MR. HODGKINS: Okay. Thank you very much.

Ed?

MR. ROACH: This is Ed Roach.

I have nothing else to add. We are trying to gain stakeholder input on this.

MR. HODGKINS: Okay.

MR. ROACH: We have done our initial evaluation in-house. So, we are looking for additional input.

MR. HODGKINS: Additional inputs? Mike?

MR. BOYD: Mike Boyd, EPA.

I don't think I have anything to add, either. Just to point out to you it's Appendix I.

MR. HODGKINS: Oh, not "1".

MR. HAYNES: Larry Haynes, Duke Energy.

I guess the overall perspective for the change is just thinking through how we implement at our facility. There's computer codes, procedures, training. So that is the big impact that we will have to absorb that. There's no way around it.

The things that Ralph said, we talked about the benefits, and where we end up at the end of the day, my opinion, it's worth the effort to get there. We know that it will be an expensive undertaking.

The last time we changed Part 20 we had a

whole team assigned to it, and it was years to work through that. And that will just have to be the way it is.

That would be my preference, too, if we talked about Part 20 and Appendix I at the same time, so that team could address it all in one approach versus having to do it in two different activities.

MR. HODGKINS: Thank you, Larry.

Brian?

MR. LITTLETON: Brian Littleton with the EPA.

I probably will answer this question by talking about what the agency must do, the EPA must do, in order to get a rule out. And that's that we are required to do, and I think the same requirements apply to the NRC, to estimate the impacts to the State, the impacts to industry, and then, also, provide information on the impacts to our programs.

With our programs, you know, those types of estimates are how much FTE it takes to get a rule out, contractor dollars. I believe all that has to be public knowledge.

But the important aspect of this is that we do have to develop, I guess, considerations of the impacts to the states in implementing our regulations,

changes, any changes that we make, as well as the impacts to industry. It is something that, I guess for those who aren't aware -- and I'm speaking probably more to those out there in the public, that they should take a look at it, and then industry needs to be aware that, if somehow we underestimate or overestimate those impacts, that they can weigh-in on those as well during the proposal part of our standard.

MR. HODGKINS: Thank you.

Roger?

MR. PEDERSEN: Well, being part of the NRC staff, I am part of the contingent here that is, hopefully, on the receiving end of this. We are looking for input from our stakeholders in the industry as to what specifically the impacts would be and the costs associated with any of the changes of these options.

The only thing I would add, however, is that since we are a fee-recoverable agency, changes that were somewhat referred to earlier, such as changing our inspection program, training our inspectors to whatever changes we make in the regulations, changes to the reactor oversight process, are all costs that the industry will ultimately bear.

So, there's some indirect costs there that I guess should be kept in mind, although I am not sure that we can be any clearer as to what those specific changes would be at this point.

MR. HODGKINS: Thank you.

William?

MR. SMITH: William Smith with Southern Nuclear Company.

One of the major changes I have thought about is related to the Offsite Dose Calculation Manual. This would be different for -- currently, operating sites probably have as many as 15 to 20, 30 different ODCMs that meet the same purpose. But, for the new operating, new licensed plants, they have committed to a radiation protection template that is an Offsite Dose Calculation Manual that will ensure that all of the new programs are consistent.

So, one of the challenges for an operating plant that is building a new plant would be the need to integrate those two programs. So, the timing of any integration of programs would be critical when you're getting ready to start up a new plant and you are also trying to change programs to meet new license requirements.

But that, within itself, could be an

opportunity to plan some efficiencies in the way that this new rule is implemented, based on the way the rule is written and the way it is required and who is required to implement it.

And if you had a single-type Offsite Dose Calculation Manual that was approved by the NRC that all of the utilities were using, that would also reduce some of the cost of the utilities, and that might also lead to some standard programs that the NRC could have developed that utilities could use. So that would also reduce one of your costs.

And one of the other programs that I can think about that the Offsite Dose Calculation Manual feeds into is your emergency planning. I think we mentioned something earlier about the protective action guidelines.

The way utilities calculate that is using the Offsite Dose Calculation Manual. You typically come up with the values that you will take actions based on calculating that dose of whatever the number, 1 rem, 5 rem. So, when you change the methodology in your Offsite Dose Calculation Manual, you are also changing aspects of that program and your emergency action levels that you're using at the sites.

And there are several more items, but

Ralph will present those to you.

MR. HODGKINS: Ralph?

MR. ANDERSEN: Ralph Andersen, Nuclear Energy Institute.

Hopefully, I'll touch on some of those.

In addition to the things that have been mentioned, I come back to the element, too, of looking at the design certification and the COL process and consider both the impacts and the benefits that are inherent in that.

I take the word "impact" to be neutral as far as whether it is a positive impact or a negative impact. But I think, looking forward, there could be a substantial benefit moving forward there with probably less impact than on the currently operating facilities.

This question also needs to be connected with the discussion later. We will need to revisit this somewhat when we talk about required versus voluntary and issues like that.

But the other thing that the NRC would need to look at, and certainly we would, would be a change to the cost/benefit provision within Appendix I. We have been talking a lot about the dose provision, but Frank Congel I think had alluded to the

rule does a lot more than have some dose criteria.

Presumably, the change in values, I know one offering has been from 1,000 to 2,000, but that could change, too. That is dollars-per-person rem that would drive consideration of changes to the radwaste processing systems.

One would think that would not have any significant impact on either current or future designs, but, clearly, that would be a significant aspect to look at as well, again, for completeness.

MR. HODGKINS: Thank you.

Now we've got 15 minutes left for this one discussion item. So, do you want to go through the questions more quickly or how do you want to handle that, Jean-Claude?

MR. DEHMEL: Well, let's go through the question and see what kind of responses we may get and questions or inquiries.

MR. HODGKINS: Okay.

MR. DEHMEL: So, the next one -- I presume we're finished with this one. The next one has to do with, are there any estimates of the cost that would be incurred by utilities or stakeholders with respect to changing the regulations? Obviously, we are not expecting any cost information right now.

But with respect to having to revise the operational program, implementing procedures, computer codes, and personal training, these are the kind of costs, broad cost considerations that we have identified so far. They may be a structure that the industry may provide to us with some specific information.

We have identified whether or not it is feasible to segregate the costs with respect to a PWR or BWR, maybe a generic power plant, which perhaps may be the easiest way of doing it, but we're leaving that option to you as to how you would present the information.

There is some debate whether or not, you know, are the cost differences such that there is a notable difference between a PWR and BWR, and we will let you make the determination. A case could be made that there is no significant difference, in light of the other estimates that you have to generate. So those may be lost in comparing the respective error bands on each of the estimates.

And the other thing that we are interested essentially is getting in an aggregate cost for all of the operating fleet of reactors, if it is possible. So, either you provide us the tools and the

information for us to do an analysis on a plant basis, and we can do the multiplication, or you go ahead and provide a single unit cost, and then an aggregate cost over the entire fleet of power plants.

So, this is essentially a request for supporting information.

MR. HODGKINS: Is there any reaction from the panel on that? Okay, let's go around then. And I won't go all the way around the table, just those who have a reaction to it, then, or a comment.

MR. ANDERSEN: Yes, my initial reaction is that I think it would be difficult to provide meaningful quantitative information in the absence of a strawman of what would actually be proposed.

I would comment that, given what your current challenge is in terms of providing a SECY back to the Commission, my recommendation would be to try to stray away from any inference that meaningful quantitative information can be provided at this point. I mean the best we could do, and I think we could attempt that, is to make some reference back to what we spent before to change things under Part 20, but Part 20 isn't Appendix I. As you point out, there could be differences between plant types that would be relevant.

Now, personally, I would suggest that the appropriate time to do that would be following an affirmative Commission decision to go forward, would be in the form of an ANPR. That is where I would really reside, is as an advanced step to actually formulating a proposed rule, would be to actually put out an Advanced Notice of Proposed Rulemaking in which people can respond to specific proposals and address that issue more robustly.

But, otherwise, it is difficult to know. In this case, there's so many options for what a final rule -- or excuse me -- a proposed rule might look like. I'm not sure the data might not be misleading, but I will defer to some of my colleagues to offer their thoughts.

MR. HODGKINS: There were some head nods to some of your comments, Ralph. Is that just echoing, amplifying his comments, or is there something else that you would want to say?

Roger, anything to add or a new topic?

MR. PEDERSEN: I was going to see if anybody responded to your question before I raised something new.

MR. HODGKINS: Oh, Michael did.

MR. BOYD: Mike Boyd, EPA.

This is not an EPA comment, but I also am on the Nuclear Energy Agency's Committee on Radiation Protection and Public Health.

And just because I don't see any of the NRC folks in the room that work with me on that Committee, but just to let you know that the CRPPH, that Committee, has, in response to a request from NRC, has undertaken a survey of European and Asian countries to try to get estimates of their cost of moving from ICRP 26 to ICRP 60, just to get a handle.

This is much broader question than 50, Appendix I, but there may be in that fairly lengthy questionnaire that's being circulated some information that could be of use in this process.

And another comment I wanted to make is that, reflecting a comment that Mr. Smith made about the ODCMs being standardized, I think for new reactors now there does seem to be a very ripe opportunity, say, for a class of reactors, whether it's EPPR or AP1000, or whatever, developing some standard techniques that would reduce the overall cost on individual utilities.

MR. HODGKINS: Thank you.

Another comment? Roger?

MR. PEDERSEN: Actually, that segued right

into the comment I was going to make.

Since we're asking people to provide us cost estimates as best they can, with deference to Ralph's comment that this might not be the right time, but my question was whether you can work in economies of scale, if standardization of procedures, computer codes, would lower the cost per reactor as opposed to doing it on a piecemeal basis through the industry, you know, if the industry could get together and develop these standards similar to the process that was referred to earlier of the templates that are being used in the new reactor licensing.

MR. DEHMEL: Jean-Claude Dehmel.

I just wanted to point out that we are looking for that kind of information for the purpose of reaching our management. Whether or not this information makes it into the SECY paper is another matter.

But, invariably, as the staff develops its draft SECY paper, the attachment to the policy paper, invariably, our management, our Radiation Protection Steering Committee initially, and then, ultimately, the TAs before the Commission, there will be some questions. You know, does the NRC staff at that point have a kind scoping estimate of what these costs might

be? It's for that purpose.

We understand that, when we go into a rulemaking process, it is a completely different realm and there is a process to obtain information, a recourse, that more specific information, we understand, but we are not there yet. But, nevertheless, there may be some questions raised about costs.

Let me move down to the next slide.

MR. HODGKINS: Wait a second. I think we've got William.

MR. SMITH: Yes, to respond to one of the comments that Roger made about standardizing some of the programs.

Well, we did have the effort for the new plants related to radiation protection programs and some of the other programs, but, also, there is an industry working group related to one of the designs, the AP1000. There are programs that are being developed right now, and there are also what they are calling templates of programs and schedule that is being developed that would standardize programs across operations, chemistry, instrumentation, and all of those disciplines are feeding into that.

And I'm working with the group for the

radiation protection part of that. One of the things that it will do is, backing out from the 2016 startup date, come up with dates that programs will be ready, and then that would also factor in the NRC inspections that need to happen. That is in the early stages right now.

And one of the other things that it is doing is identifying any risk to different programs based on changes in regulations. Of course, this would be a risk to the program, and we will come up with some way to manage that, you know, how we address the changes that need to be made. Something like that will probably easily go across the industry and come up with a new program.

MR. HODGKINS: Thank you.

Jean-Claude?

MR. DEHMEL: Jean-Claude Dehmel, NRC.

This is the last question in this issue section having to do with, if we were to revise this, and understanding that there's got to be essentially some synchronization between a Part 20 rulemaking and a Part 50, Appendix I rulemaking.

The question, then, should there be two separate rulemakings or should there be one rulemaking? So, this is kind of also left as an

option to discuss and determine whether or not, for example, you could see that the Part 50, Appendix I, could be, as we noted again earlier by Mike Boyd, that it could be separate from the Part 20. But, in the end, whatever we do decide to do with Part 50, Appendix I, the dosimetry considerations, they would have to be consistent with whatever has been adopted in the Part 20.

So, another possibility would be to have two separate rulemakings, but one offset in time. For example, we might have Part 20 first, and then start at some time in the future, an offset of six months or eight months and maybe a year, a rulemaking for Part 50, Appendix I, in the hope that during that initial time period, that offset time period, a decision will be made as to how we would adopt ICRP 103 recommendation into Part 20, and then extract that basis and slip it into the Part 50, Appendix I, rulemaking process.

So, we would like to have some thoughts about that.

MR. HODGKINS: Any reaction from the panel, then?

Okay, let's start. Ralph?

MR. ANDERSEN: Ralph Andersen, Nuclear

Energy Institute.

I would strongly recommend that you consider pursuing this, if they go forward as two parallel rulemaking efforts. And there's a number of reasons for it, but I will just touch on a few.

From a logistics point of view, Part 20 involves the totality of NRC licensees and the totality of NRC agreement states. Changes to Part 50, Appendix I, include Part 50 licensees only, and because of preemption, in effect, do not involve the agreement states or the states themselves, although some states, at their own volition, do have some informal oversight process that they have instituted for power reactors. But, in essence, you're dealing with a very limited community. So, just from a point of view of the logistics of the types of activities you would engage in in a rulemaking, that would argue for two parallel rulemakings.

Secondly, I believe that the underlying issues in both are substantially different, although they share a commonality and the possible methodology that might be employed. And again, I harken back to comments previously by Frank Congel and others.

This rule is for categorically different purposes. Actually, to your own comment, Jean-Claude,

that Part 50, Appendix I, serves a different function than does Part 20, in regulatory space, your comment about safety standards versus other types of criteria.

And I think you would create a lot of confusion if you try to combine the two rulemakings. So, that, to me, would be another reason to pursue parallel.

Thirdly, in terms of process, you know, I had already mentioned that in the case of Part 50, you are going to likely need to solicit certain information to support the regulatory analysis, and particularly to address the backfit issue that we will talk about later, that probably will be quite different than what you would need to do for the update to Part 20.

And again, I think that trying to go out commonly to everyone and say, hey, we want all of this information, and, oh, then, stop reading here, and for the rest of you we also want this kind of information, again, could undercut your effort and make it less efficient.

And then, finally, our high-level recommendation remains intact, which is that we will be encouraging that NRC, and then, additionally, the federal family, be looking at creating better

harmonization between all of its regulations. Then, in the NRC case, we will be arguing for consistency, not just harmonization.

So, we will be asking, both in our comment letter and in future interactions with the Commission, that the Commission look at updating Part 20 and making conforming changes throughout all of its regulations, to establish a common methodology, i.e., ICRP 103.

That would not capture Part 50 in its totality, except in a consistency and method. We would still see Part 50 needing to go its own way for a rulemaking, just as Part 61 would have to go its own way for a rulemaking. But we would like to see Part 20 include conforming changes to the other regulations, as needed, to get everybody on the same technical basis.

MR. HODGKINS: William, did you want to add to that?

MR. SMITH: This is William Smith with Southern Nuclear Company.

The only thing I will add to what Ralph mentioned on the two parallel paths, and that's the last part of it, is a common implementation date. That would really be critical in change in management

and rolling out your training and your procedures changes, you know, by having a common implementation date and, as he mentioned, in harmonization with the other agencies' changes.

MR. HODGKINS: Any other reactions, then, from panelists? Larry?

MR. HAYNES: I think I have got it all. I agree with Ralph. I think one point I would make, in addition, parallel would be, obviously, being completely different aspects to try to be parallel, but they need to be synchronized. As William said, we end up with implementation dates that teams can approach together that we have a single approach to it.

I thought I had two, and in listening to the comments about the purpose of Appendix I, would it be reasonable or something to consider, take the operational aspects out of Part 50, Appendix I, and put those in Part 20, and leave the design criteria aspects in Part 50 and 52, and separate the two? Then, maybe we end up with the operational aspects over in Part 20.

MR. HODGKINS: Thank you.

Anyone else from the panel, then, want to discuss that?

(No response.)

We will close, then, the discussion on Question 1 with any audience feedback or any webinar feedback. Is there any?

(No response.)

Give them a couple of minutes, seconds, to respond.

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

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

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

So now we are talking about the issue of making the changes to Part 50, Appendix I, available as an option to all operating licensees as well as applicants or making it a required implementation. So, let's go to these options.

If we had a voluntary implementation, then, on option 2a, we would have to retain the current guidance to current requirement, because that would have to be available with the option of implementing or not implementing the revised Part 50, Appendix I.

The other option would be to item 2b,

would be to make it specifically available as an option for currently licensed and operating power plants, using in this case two separate sets of Appendix I regulations and guidance.

So, we would have the existing Appendix I standing as it were. We would develop a separate Appendix I that would essentially represent or capture all of the revisions, all the changes, and a parallel set of Reg Guides. The licensees and applicants, then, at that point could apply whichever set of requirements were selected or opted for.

So, the effort, obviously, on Section 2b, we would have to develop a parallel set of guidance documents, computer codes, and so on. So, whether or not we would essentially have another Reg Guide 1.109 or there could be a Part a and b to existing Reg Guide 1.109. That would have to be addressed separately.

Similarly, with the computer codes, that obviously would have to be completely different computer code, self-standing computer codes.

The basic NUREGs, 1301, 1302, on the Offsite Dose Calculation Manual, the surveillance requirements, and the action requirements, that would have to be perhaps another set of guidance documents.

Item 2c would be a situation where the NRC

would impose the implementation of Appendix I on all power plants and all applicants with respect to -- and it would, obviously, consider an implementation date that would be sometime in the future.

So the thought is that we have these options. Whether or not there are any alternate options to this, we are going to leave it open, and maybe we can just go around the table and start talking about whether or not there are already some options and what would be some of these options.

MR. HODGKINS: Round robin, let's go. Ralph, you're first.

MR. ANDERSEN: Ralph Andersen, Nuclear Energy Institute.

Looking ahead, also, at the questions you have following this, these are the right questions to ask, but I will just comment that, in a sense, these are chicken-and-the-egg questions. But most of us, if not all of us, here are quite aware of the backfit provision in 10 CFR 50.

What I would suggest is that there has to be an iteration between proposing what the NRC would do and why it would be doing it and evaluating how it is stacks up against the backfit provision.

In essence, the way to do that is to do a

backfit analysis. No matter how you cut it, if you intend to apply this requirement or these changes to existing facilities, it is, by definition, a backfit; i.e., you would be changing your regulatory position.

Given that, then you already know that you will need to do a backfit analysis. Backfit doesn't mean that you can't do it. Backfit means that you have to do an analysis against the criteria in Part 50 and determine whether you can and should go forward or not, whether the backfit is justified.

So, I think, rather than spending a lot of time in discussions phase not only here, but going forward with your SECY and everything else, from a procedural point of view, I don't see that you have -- you could either decide at the outset that, for whatever curious reason, you want to write a regulation that only applies to new plants.

Now there was a justification for 10 CFR 20.1406, that that choice was made at the outset. And that is the minimization of contamination that applies only to new applications. And there were reasons why the staff determined that that would only apply to new plants. Of course, more recently, the staff has determined that they want to apply it to operating plants as well, but that's another story.

But I would say that, absent any reason why you would only want to update this regulation for new plants, that the question, rather, should be, what should the elements that should be covered in the backfit analysis be that might influence the model that you use to do the backfit analysis? Because you're going to end up having to do one. Unless you decide not to change the regulation, you're going to end up doing a backfit analysis.

In every other area, updates to Reg Guide, and so forth, the staff has chosen to punt and simply say, well, we're not going to require this for new plants, so we don't have to do a backfit analysis. This is an area where I would suggest to you that a backfit analysis is not only necessary, it is highly desirable, because I think it will lead you to conclusions about what the ultimate rule should look like, if you are going to go forward.

So, anyway, that's my input.

MR. SMITH: Nothing additional for that.

MR. HODGKINS: Brian?

MR. LITTLETON: This is an issue that I guess some of the discussions that we had earlier today kind of fed into, and that happened to deal with, I guess, whether you all were implementing

portions of the EPA's standard through some of the constraints provided in the Appendix I requirements.

And to that, I would say that, if that's going to be the case, if it's the case in the past, and I think it is, and if it has the potential of being the case in the future, and I think that it does, then I would say that I would not be in favor or the agency probably would not be in favor of making these requirements voluntary. We would be looking towards probably making them mandatory.

MR. HODGKINS: Thank you.

Larry?

MR. HAYNES: With the assumption that we did all the things Ralph talked about and say, okay, we're going to revise Part 50, Appendix I, I could see plants that aren't going to build a new plant on or near their site saying, why should I change? So, if it was voluntary, probably not.

Then you end up with plants that would voluntarily change, and those that had plants on the same site or a utility that had multiple existing plants and a new plant, why would I not have everything on the same basis and would make the change? So there would probably be a split if it was voluntary.

The downside to that would be, then, from a benchmarking standpoint for utilities going down the road, in addition to all the complications of having Part a and b to different Reg Guides and NUREGs, we will lose the bubble on apples-to-apples comparisons, and it would just be complicated.

So, it would be my opinion that, if we're going to do it, let's just all do it, make it mandatory, and go on with it.

MR. HODGKINS: Michael? Ed? Carolyn?

MS. HILL: I think the only thing I would add is that I thought that one of the arguments of the NRC was that they wanted to decrease the regulatory burden of having two dosimetry methods. And it seems by having the voluntary implementation, you would actually, then, be increasing that burden by keeping up with an old set of regulations and a new set of regulations. I think it would also come down to the public as being difficult to defend the dual positions to somebody outside of the field.

I guess that is the only thing I would add at this point.

MR. HODGKINS: Thank you.

Okay, do you want to go on to the second one?

MR. DEHMEL: Jean-Claude Dehmel, NRC.

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

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

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

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

MR. ROACH: This is Ed Roach.

I think from our perspective, reasonable timeframe to implement the regulation is necessary, and that is something that would really be determined a little farther down the line when we get our hands 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.

Roger?

Needs a microphone. Ralph's been using the microphone too much, huh?

MR. PEDERSEN: Yes, that's fine.

I agree with the statements that have been made that the implementation period should be somewhat reflective of how extensive the changes are that would be made, which, of course, we don't have a good vision of at this point.

But the last question that was asked, whether this implementation, even if it is synchronized with Part 20, would be more complex or less complex than the 1990 three-year implementation, the 1990 change to Part 20 that we provided a three-year implementation for. That rulemaking, I mean there was a significant paradigm shift between ICRP 2 and ICRP 26. A lot of that three-year implementation was an educational period. We assumed people needed to get up-to-speed on these concepts.

So, I can't see that this implementation of 103, and even synchronized with Appendix I, would need that much retraining, if you will. So I am not sure that the implementation period, I can't see anything that would require it to be any more than three years, and it would seem to me it could be

substantially less.

MR. HODGKINS: Okay. William?

MR. SMITH: William Smith with Southern Nuclear Company.

I do not believe it would be as difficult as the 10 CFR Part 20, but one of the other things that we would have to consider would be the phase that the new plants are in, when this comes out, and the implementation phase. Because, currently, if you are developing procedures and programs right now for a plant that you plan on operating in 2016, if this came out in 2014, you would have to have that program changed, if you had a two-year implementation period. So that is one big consideration for the new plants.

MR. HODGKINS: Thank you.

Ralph?

MR. ANDERSEN: Ralph Andersen, Nuclear Energy Institute.

Yes, to echo William's point, I think consideration needs to be given to that situation with new plants receiving their COLs and then coming into operation.

Probably the largest consideration, and our biggest lesson learned from Part 20, though, the implementation date for either Part 20 or Appendix I

to 10 CFR 50 needs to be conditioned to the very last issuance of the very last supporting document, software code, or whatever. Ideally, those would all be issued at the same time that the final rule is issued. That is always our recommendation to the NRC, that issuance of the final rule be accompanied with issuance of the final guidance documents.

But where that is not the case, what we have always recommended is that the implementation date should be conditioned to the issuance of the very last Regulatory Guide that will be necessary to do the implementation. Otherwise, we find what we found with Part 20, which what Roger didn't mention was that, actually, the implementation date had to be revised. That was primarily because not all the Reg Guides were available to implement the requirements.

So, as far as scheduling implementation, what needs to be taken into account, depending on the scope of the change, is all of the Reg Guides and codes and things that you alluded to, and what the reasonable schedules for revising those with due public comment, and so forth, and issuing those in final form, would be, and then targeting implementation to follow behind that.

And that's really, as I think we all know,

the lion's share of the work is not changing the simple wording in Appendix I. The lion's share of the work is in all the supporting guidance.

So, I will make another comment at the same time. Please, if you go through this process, and I won't be around to watch the tail-end of it, at least not actively, issue consolidated guidance. I think we have got some 20 Reg Guides currently associated with this, and I think it would be very, very important to look at consolidating the guidance into a single document.

MR. HODGKINS: Thank you.

Ralph? Michael?

MR. BOYD: Okay. Mike Boyd, EPA.

This is a comment that applies probably more to Part 20 and Part 190, our Part 190 as well, but in addition to the comments Ralph made, we are also tied in part to the ICRP's schedule of updating their ICRP Publication 68 and 71, particularly 68, I would think, for worker dose conversion.

And that does become an issue for both of our agencies. I think you heard Brian mention in a comment yesterday that we even have on the table updating Part 190 to an ICRP 60-base dosimetry as a 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

also is tied up in the Regulatory Guides. And I think what we point at is the Regulatory Guides can be revised, changed, updated. You really don't need a rule change to do a lot of that.

There's a lot of flexibility that can be built into that process of a staff implementation of the Appendix I requirements for applicable tech specs and the environmental monitoring program that you can kind of look at separately again. And you can almost do an equivalency-type evaluation where you could update Appendix I, incorporate the new effective dose concept, and also show an equivalency from an operating plant standpoint that current methodologies provide an adequate level of compliance.

There's a lot of evaluations that need to go into that, but it is a concept that I would recommend that the staff explore, that there are really two phases of Appendix I. One is that which is done at the design basis as a licensing tool, and then the second element, which is then the technical specifications, which then provide a continued assessment program to ensure that efforts are maintained to keep releases ALARA.

MR. HODGKINS: Thank you.

Don?

DR. COOL: Donald Cook, NRC staff.

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

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

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

through its revision process, those would become applied when they became available.

So, it is a slightly different process, leads you to some different ramifications, because then you have a mixture over time, and you have to keep track of what documents are available, but it actually puts the onus on keeping track of what somebody else produces, unlike here in the United States where it has to be clearly noticed and commented as available.

The other thing, the second item that I would like to put out here on the table -- and I'm not sure that we have clearly sort of talked about it, but let me just suggest it for people to think about. One component of doing all of the guidance and the updates is the work on the codes that do the calculations. And it's pretty clear what the methodology is. That is already pretty well known.

And, in fact, I would suggest that one possibility is, once there is a policy decision to move in a particular direction, that work on codes that implement the methodology and update, and starting to do the verification and validation, other things could move forward, and dose coefficients that have been updated and gone through a comment process

could be dropped in later, if you will, if someone much smarter than I were doing the programming such that it wasn't hardwired into the software as much of it is today.

Thank you.

MR. HODGKINS: Thank you, Don.

The next person on microphone 1.

MR. WRIGHT: This is Tim Wright with Duke Energy.

I would like to address Question 2-1 first about whether it be voluntary or mandatory. We absolutely have to end up with everybody being on the same page with this one. If we don't, one of the unintended consequences is going to be from the INPO world and the ANI world you are going to end up with a best practice. And once you end up with a best practice, if you're not one of those people that's doing the best practice, once you enter the litigation world, you just handed the lawyers a golden egg. So we have to end up on the same page when it is all said and done.

The other statement that I would like to make about it is the question of the implementation window. It is true in 1990 we had a longer implementation window because we felt like we needed

to get people up-to-speed. But the other part of that, in 1990, our staffs were about twice the size they are today. So, in today's environment, it is very difficult for me to take one of my staff people completely out of the day-to-day work and go just work on this. Because when I do that, there's two or three other programs that they manage that now I have to get somebody else on my staff to manage.

I'm not a real popular person when I do that to people. I've had to do it, but I don't like to do it. So I would prefer a longer lead-in period, so that we don't have to just completely dump somebody, and somebody else has to pick up their work for the whole time.

That's all I've got.

MR. HODGKINS: Thank you.

From the microphones, any panelists want to react to or talk to those issues?

(No response.)

And it's back to microphone 1.

MR. DAVIDSON: Yes, hi. It's Scott Davidson, New World Environmental.

The best practice, does it mean the best science, and are we going to then wind up having, in the case of the nuclear plants, having to go beyond

where you leave off if you get to another iteration of an ICRP? Or are we just going to stay with this is what the regulation is?

So, to continue with best practices, you need to then say we're going to do the best science, and we clearly lag in that. So I don't know how they reconcile that in the INPO mindset. Or maybe the nuclear plant people can answer how best practice is capped.

MR. HODGKINS: Okay. Anybody from the panel want to talk to that, address that issue? This is just for comment.

(No response.)

Okay. Yes?

MR. WRIGHT: This is Tim Wright with Duke Energy. I will be glad to take a stab at what best practice from the INPO world is.

And what we have seen so far, best practices is whoever the utility loanees at INPO are at the time. So, this year it may be Duke Power. It may be Southern Company. It may be Exelon. That best practice is a moving target, unfortunately, but that is the world we live in.

MR. HODGKINS: Okay. Ed?

MR. ROACH: This is Ed Roach with the NRC.

In a previous life, I was exposed to the INPO assessment process. In general, what you find is that the NRC regulations set the minimum standards for being adequate or meeting the regulations, and that INPO's charter was to drive to excellence performance at the plants.

So, where there might be variability in various assessors, they do have some standards that are captured in manuals to look at certain things to drive the whole utility industry to a higher level of performance.

MS. ELLEN ANDERSEN: Ellen Andersen from the Nuclear Energy Institute.

For your information, in the radiation protection area, INPO is actually working with the utilities to establish industry best practices for specific issues. So that is actually being led by a representative from Exelon. They have actually identified certain issues and have gone out there and have determined what those best practices are, based on risk, based on -- there's a couple of different issues, criteria.

But it's changing. It's no longer what the person at INPO thinks it is. It is what the industry believes industry best practices are.

MR. HODGKINS: Thank you.

Okay, any other comments then?

(No response.)

I think we are going to go on to Question No. 3 or option No. 3 and discussion of that.

MR. DEHMEL: Jean-Claude Dehmel, NRC.

Option No. 3 addresses itself now to the guidance. Essentially, we're kind of looking at the guidance document, namely, the number of radionuclides, the Reg Guides, the computer codes, and the SRP in this particular in this particular context.

So, how would we, in essence, implement whatever Part 20 did with ICRP 103, how we would essentially import this into the guidance associated with Part 50, Appendix I.

So there are three options: limited scope option, expanded scope, and a full-blown revision of all of the guidance, all the computer codes. So let's take those one at a time.

Limited scope revision would be kind of a surgical update of the guidance as well as the computer codes, meaning that we would identify the dose conversion factors that would need to be revised and slipped into the new libraries and a tabulation. The dose computation methodology would be different,

obviously. So, those algorithms and subroutines would have to be changed. And stop at that.

In essence, we would limit the revision to the guidance and the computer codes to only strictly the dose conversion factors and the calculation methodology, and leave everything else. So, that means that the implication of that is that we would revise, obviously, the conversion factors, but everything else that essentially is equally important to the dose, for example, usage factor, default assumptions in the Reg Guides, and so on, intact as they were.

So, we would be coupling state-of-the-art information on dose and dose computation or methodology with older assumptions and parameters that are still 20, 30, 40 years beyond the times, as it is documented in the Reg Guides as well as the computer codes, the NUREGs that support the two computer codes, the LADTAP and the GASPAR.

Option 3b would, in addition to the above, say we would look at, obviously, revise again and import all the dose conversion factors, but, then, we would look at the next tier of parameters, assumptions that are equally important to dose, such as usage factors, for example, and revise those as well.

The implication here is that we would look at all of these parameters, revise them, all the dose conversion factors again, updating with current state-of-the-art information, or whatever is available in the literature, and then leave intact the basic models, the basic model having to do with, for example, dispersion, aquatic dispersion. All of that would remain unchanged.

The same thing with environmental transport models that are described in Reg Guide 1.109. Those models would be unchanged.

MR. HODGKINS: Do you want to go on to 3c?

MR. DEHMEL: Yes.

MR. HODGKINS: Okay.

MR. DEHMEL: And this, 3c, is a full-scope revision. In essence, what we would do, this would be a bottom-up, a top-down review of everything. Not only we would obviously import all the appropriate dose conversion factors, we would revise the calculation methodology, the subroutines, the equations, everything. We would look at all of the default parameters that are currently built into the code, all of the assumptions that are identified in the several tables at the end of Reg Guide 1.109.

Then, we would go beyond that. We would

look at all the dispersion models. We would look at environmental transport models that are described in Reg Guide 1.109. We would look at the aquatic dispersion model and the airborne transport model. So, that would be, obviously, a large effort.

So, in essence, this is essentially saying Reg Guide 1.109 and the two associated computer codes, as well as the chi over q computer code. The water transport model would be literally set aside, and we would spend all this time and effort to update everything.

So, the implications here, obviously, are on all of these, as you can see, the first option is perhaps the quickest that could be implemented. The second option is kind of a midpoint, where it involves a little bit more complexity, but it would take least amount of time. And option 3c would be quite extensive because we would talk about, at this point, reviewing and revising all the models and having to not only revise the model, but also justify the models with respect to doing verification, defending the new models, subroutines that may be identified, developing a whole new guidance document supporting the assumptions, supporting the new environmental 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

major revision to Part 20 previously. So, here we are 20 years later sort of reorganizing the resources to take this on again. So, as much as can be done and updated in the context of this current process, in my mind, would be preferable.

That being said, there is also the realism of whether there is sufficient opportunity for getting the budget and resources to do 3c, and I don't have any sense for that, Jean-Claude. It may be that the scale of that effort simply exceeds what you could possibly hope for for downstream budgeting, especially if you keep living on Continuing Resolutions. So, some realism needs to come into play for that.

So, for an informed answer to that, in our written comments, it might be helpful if we were to gain a better understanding from an NRC resource point of view as to what the relative size of those efforts are from your perspective. Is 3c 50 times larger than 3b? I don't have a good sense for that, of what it looks like in terms of all the necessary work that would have to be done.

MR. HODGKINS: Thanks, Ralph.

MR. SMITH: William Smith with Southern Nuclear Company.

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

twist to option 3b. That is that this is something that we kind of think about when we think about whether to revise certain portions of our standards or not. That is maybe doing a sensitivity analysis on those aspects of, let's say, the standards which are going to have the major impact, and then just considering those in the revision, as opposed with just a wholesale change everything, which you may not have the money or the time to be able to handle.

MR. HODGKINS: Thank you, Brian.

Larry?

MR. HAYNES: As a health physicist, my gut is let's get the best science possible into our processes. From that perspective, I would like to see the full-blown effort. I know that that is a long-term issue and would take a significant amount of work.

And from a benefits standpoint, I can see that a lot of this research and work would be done in universities, other organizations. So, that is an opportunity to bring new folks that are going to staff our plants in the future, they would bring that knowledge with them. So there's some advantage to that from that perspective.

It also, though, has to do a lot with,

what's the implementation period, and are these things, can they be basically planned out in a project plan where maybe 3b is the target method or plan, but the pieces that plug into that to turn 3c into the ultimate product would maybe come later. So, if a plan is built around it, maybe you can do it in pieces and implement in the timeframe we would like to, but still build into the back-end the final product.

MR. BOYD: Mike Boyd, EPA.

I, like most of the people that have spoken so far, find the good science/new science attractive. I think, though, that in my experience a lot of times the old science, the old models, the old compliance models in particular, were intentionally quite conservative. So there is an option where you could let the licensee, if it were to his or her advantage, develop a more complex, a more elegant model that was less conservative, so to speak, but more accurate, if it became an issue of demonstrating compliance.

So, sometimes the old things, because they were intentionally conservative, were completely adequate. So I don't know.

I did have one other comment, and that was, listening to Frank and Larry this morning, I

found myself being persuaded a little bit that maybe there is an attractive option of putting operational quantities in Part 20 and making 50 just design objectives. I thought that was a good idea.

MR. HODGKINS: Thank you.

Pass?

Jean-Claude, do you want to add anything to the discussion?

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

A couple of comments, and those are essentially staff's observation as to what we are thinking about the guidance, the Regulatory Guides and the NUREG. Let me kind of outline to you what the staff is thinking at this point.

It is that we would take the NUREGs that support all this, NUREG 1301, 1302, NUREG 0133, and NUREG 0543, which is compliance with the 40 CFR 190 aspect of Part 20. That would be collapsed into one single document, one single NUREG.

The implication of Generic Letter 8901 is not clear yet whether or not we could revise the Generic Letter, or would we have to issue a new one? I don't know. This is kind of a policy issue, and someone else will have to make that determination.

But because Generic Letter 8901 pieces out what used to be, in effect, specs before and apportions it to the operational program and NUREG 1301, 1302, so a determination would have to be made as to what retains in a tech spec per se, what the prior tech specs are, capture the operational program of the tech spec, and what should be retained in the revised 1301, 1302 NUREG as one single document.

Reg Guide 1.109 would be revised, and it would stand alone. The same thing with Reg Guide 1.111 and .113. 1.110, on a cost/benefit analysis, is going to be revised.

And what we did not mention earlier is there is an effort, as we speak, within NRR to revise the cost/benefit ratio. So, this would be done before we even start this effort.

So, by the time we are ready to go -- ultimately, you have an announced proposed rulemaking. At that point, we will be able to describe and discuss how the revised cost/benefit ratio and how they are going to be implemented. That is something we don't know yet, whether or not it is going to be implemented as a SECY paper or a new NUREG 1530 that would supplement, supersede the 1995 version that introduces the $2,000 per person. We don't know that

yet.

But that is going to be imported into the revised Appendix I. So we would essentially piggyback that portion of the revision in Section 2(d) of Appendix I. The Reg Guide would be revised, obviously, at the same time.

In the next SECY paper that you will see in October of 2011, there is a discussion about the implication of revising the technologies and some of the costs information that is described in the Reg Guide 1.110 having to do with labor cost, equipment cost, maintenance cost, and also revising the list of technologies that are described in that Reg Guide.

There are other technologies that are used in new reactor applications that are not listed in Reg Guide 1.110. Some of the sizing of the equipment in Reg Guide 1.110 is undersized compared to what we are seeing currently with the new reactor applications. So we would do that scrubbing as well and revise that.

MR. HODGKINS: Did you want to say something now on mic 2?

MR. BLAND: Stewart Bland with Chesapeake Nuclear Services.

Jean-Claude, I think you got a good handle and a good scope on it. I commend you on the

comprehensiveness of looking at it.

If I look back, though, also at the modeling, the modeling that was done back in the early seventies, and I was with the Commission at that time, you will recognize that there are really some compromises in that modeling of Reg Guide 1.109 and the meteorological modeling that were done that really don't reflect good science and good applications and the current knowledge base.

You have certain assumptions that were made relative to radioiodine partitioning coefficients between element and methyl iodide-type methods which dictated, then, deposition parameters. We are a little bit smarter on some of those kinds of items.

You reflect in meteorology that compromises and changes were made during the implementation stage that incorporated this concept of a mixed mode type meteorological release, which, basically, in my opinion is fundamentally wrong. It was a fit. It was a fit of the science at the time in order to recognize different types of conditions.

But if you go plug that into modeling and the use of certain dose parameters and such, you have got a mix of models. It really just doesn't fit.

So there is really a need, if you really

are looking at trying to improve your assessments and modeling techniques and methodology, there is a need to update the guidance on how to do it.

A lot of that, though, I will say, and I still contend, is separate from an Appendix I rule. Those are staff implementation-type guides, and they don't necessarily have to be linked together. There is some separation you can do between a rulemaking for Appendix I, and those guides, then, reflect an implementation-type method. They are quite fundamental.

But if you look at what the staff did back in the seventies or so, they came out with an Appendix I rule and then it was, oh, my gosh, how do we implement it? And all of the implementation came after the rule, and that's where you got into developing certain modeling assumptions which were effective for implementing the rule at the time.

So there's definitely a need to look at improved modeling, but, at the same time, in terms of an implementation of Appendix I and from the power plant standpoint, we are so far below those from an implementation, I will go back to I think that the power plant industry is a self-regulation industry. And to allow that kind of flexibility, to let it

continue in a self-regulation industry is advantageous, and simplifying what would be requirements of Appendix I.

MR. DEHMEL: Yes, with respect to what you noted, and I'm going to touch on that later on when we talk about issue 4. But this has to do with, ultimately, how the Appendix I criteria are revised with respect to their underlying dosimetry basis. But we would have to revisit table 1 of Reg Guide 1.109, which touches upon the doses and the models associated with complying with that particular criteria.

Obviously, table 1 directs the user to specific models and specific equations and specific dispersion models. So that would be touched upon.

I understand that the two, in essence, could be conducted independently. It's true that you could take Reg Guide 1.109 and ignore for a moment what the numerical criteria of Appendix I are and march through the process and revise the Reg Guide, with the introduction to the Reg Guide and the regulatory position to be, in essence, addressed later. And then you could march through the process.

You could do that, essentially, to all of the Reg Guides. But, as a matter of policy -- and Don may want to speak to this -- I don't know whether or

not we could initiate that effort without essentially that effort being tied to some sort of rulemaking process or policy decision.

So, I understand that, because of the policy constraints that the NRC has, the way the process is set up, I don't know whether or not we could essentially start revising the Reg Guide next year, for that matter, and working on these pieces. Because it's true, you could actually take over that, forget the introduction for a moment and the regulatory position, and actually address all of the models; everything could be actually put into place before.

And the only thing you need to do at the end is make reference to ICRP 103 or ICRP 20, 60, and 30, and slip in the right dose conversion factor tables at the end. That could be done that way.

But I don't know whether or not we can actually proceed on that basis, essentially flip the process around, start with the Reg Guide without having some sort of a driver, which would be a regulatory policy.

Don, do you want to talk about that?

MR. HODGKINS: You know what? Before Don, just let me, because we did have a webinar person, and

it might be cogent to what you guys are discussing. Let's see.

This is from Cindy Bloom.

"While a step-wise approach might seem more comfortable as one tries to morph a program, if there are going to be many programmatic changes that are all influencing each other, it would certainly be more efficient in terms of time, money, and the ability to learn and train to do it all at once with time provided for implementation."

Thank you, Cindy.

Don?

DR. COOL: Donald Cool, NRC staff.

Jean-Claude is correct that we have to have some decisions before it would be reasonable and appropriate to go off and expend NRC resources on an effort to start revising guidance, update models, review underlying models, parameters, and otherwise.

Part of what we are, in fact, trying to do today is to understand from the stakeholders, which very flatly some of you are fee payers as well -- we are a fee recovery system -- if it is viewed by the stakeholders that, once a directional decision is made to move in a direction that moves towards aligning the models, even though that needed to go through the

rulemaking process, and though the particular details of a regulation would still be uncertain, whether the stakeholders would wish, because of the timing, because of the desire to have an updated and consistent science, that the stakeholders view that it would want the NRC to also start to move the guidance development in parallel, somewhat anticipatory of an end-state, but having made a directional decision.

Because, in fact, much of what the NRC staff will do in going to the Commission next year on the policy is seek direction to move forward in regulation. And one of the things the staff could suggest to the Commission is that, in moving forward with that direction, if the Commission agrees, that the staff would, then, look to find budget and start to expend the resources in parallel, so that the guidance would be ready in a more timely manner, and that it didn't have to be in series.

So, what you are putting on the record and the viewpoint that you give to us will help us make some of those decisions.

MR. HODGKINS: Thank you.

Any reaction from the panel again?

(No response.)

Were you wanting to make a comment on

microphone 1?

MR. DAVIDSON: Hi. This is Scott Davidson, New World Environmental.

No, the whole idea of taking out dose from Reg Guide 1.109 makes a lot of sense. You are looking at what the effluent means to a receptor in terms of some intake or something like that. Then, you can let the science of dosimetry take on from the point of where the person is exposed. And that can be separate as a science thing. Whereas, the .109 could be: here's how it gets to that person.

MR. HODGKINS: Excellent.

Any other reactions from our -- yes, Michael?

MR. BOYD: This is Mike Boyd, EPA.

As I have done a little more thinking about this, I am wondering, Jean-Claude, if it really is that big an effort. Because across the federal agencies there are a lot of models that are continually being updated. I think, in part, the RESRAD family of codes that DOE has and other similar codes, where a group of scientists at Argonne, for example, are always keeping abreast of the latest parameter values, and couldn't we perhaps just validate and incorporate existing state-of-the-art

codes?

MR. DEHMEL: Yes, we realize that. The same thing with the environmental models, we realize that. All of the transfer parameters and some of the consumption and usage factors that are already documented in Reg Guide 1.109, we realize bioaccumulation factors for that for that matter as well.

We realize that there is a lot of information available in the open literature right now. The thing is that, at this point in time, to actually scrub through all this and try to identify what is relevant, what is useful, and then benchmark that against typical power plant releases, and see whether or not, you know, does it work all the time?

So there is a huge effort with the applicability, the review of the information, the validation and verification of the revised subroutines, developing whole new computer codes. So I understand that there is information that could be quickly gleaned from the public sector and DOE labs and other federal facilities.

The problem that I see or the challenge that I see for the staff is to actually sort all this information out, assemble it into a new model, and

essentially making sure that it does work, validate that, benchmark it, and then go out again for public comments and get input from everybody, doing sensitivity analysis, and so on.

So, the issue here is that this is a huge effort. We have heard from Argonne National Lab, which is interested in doing Monte Carlo-like analysis, so they are thinking, well, why don't you apply Monte Carlo-like analysis the way it is done in a RESRAD family of computer code and plug that concept, apply that concept for effluent releases.

So you would have, essentially, a distribution of what the dose might be, and then we would pick, you know, 90 to 95th percentile output. So, I thought, well, that may be okay for a safety application, but it is not a safety standard. And the question is, should we go in a Monte Carlo-like analysis for all effluent releases?

So, the other problem with that I see, and I have used RESRAD a lot when I was in the decommissioning group, is that you would have analysis that would literally take hours on a computer, and those models are very complex here. We are talking about 20, 30, 40 radionuclides. So there would be 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

actually thinking about deterministic models and not Monte Carlo.

MR. HODGKINS: Okay. Any other clarification?

MR. PEDERSEN: Yes, I do have a comment.

I would suggest that the scope of the supporting documents and guidance that could be put into place is somewhat dependent on what the change would look like, particularly whether it was a voluntary or mandatory change to Appendix I.

If it was, in fact, a mandatory and we were providing additional guidance, we could probably be more comprehensive in the changing of all those parameters that were mentioned that are currently built into the design basis of the current operating plants.

You know, from a practical standpoint, it would be easier to do that than to try to determine what all of those changes, what kind of an impact that would have for the actual operating plants, just from a practical standpoint.

MR. HODGKINS: Any other comments? Questions?

(No response.)

It is now time for lunch. So, what we are

going to do is save the questions for after lunch. It is 12:02. We are asking that you come back into the room at 1:02.

And for those folks who are on the webinar, we will be taking an hour break. Please come on back into the room, then, at 1:02.

We appreciate it.

And lunch is on your own.

(Whereupon, the foregoing matter went off the record for lunch at 12:03 p.m. and went back on the record at 1:08 p.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

1:08 p.m.

MR. HODGKINS: For the webinar participants, there are cookies and cupcakes that the local participants, I can't pull them away from the table. So we are having some difficulty here.

Come on, Don, get that cookie out of your hand.

(Laughter.)

All right, terrific.

What we will do is we are going to finish up. We will do a little recap and then go on through. There are four areas, and then the fifth one is just going to be open discussion, in case there is an opportunity that has been missed or a clarification point that you want to make.

So, for the webinar participants, please feel free to write your questions down. As a reminder, we will not be able to do the audio. It's only the written question, and we will read those outloud as best we can here, as part of the audience participation.

With that, I am going to turn it back over to Jean-Claude.

MR. DEHMEL: Dan, thank you.

Jean-Claude Dehmel, NRC.

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

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

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

(No response.)

MR. HODGKINS: Let's move on.

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

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

that.

And Ralph Andersen brought up a few points. But the thought was that perhaps in our discussion and perhaps in a SECY paper, 08-01-97, that maybe the benefit aspects was not fully aired out or there wasn't enough amplification on the benefit side.

And the next question has to do with, if there are significant impacts with respect to the implementation, how should the NRC address this in its next policy paper?

So, what I would like to do is, essentially, kind of toggle between Question 3-2 and 3-3, having to do with identifying what are the impacts and the benefits, and then the next step is perhaps ranking those and perhaps considering those that are really significant and the NRC should consider in a next step, that is, preparing policy attachment to the SECY paper and identifying some of those impacts, benefits, and those that have significant regulatory implication that we should be aware of and we should identify in the next SECY paper.

So, I am going to leave it open for discussion.

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

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

MS. HILL: No.

MR. HODGKINS: Okay. Edward?

MR. ROACH: This is Ed Roach, Health Physics, New Reactors.

And I think, again, we said this, and Ralph was the one who stated it. The benefits, clearly, and the significant impacts are -- the benefits are the public perception, getting us up aligned with the international community as well as the most recent good science, and the most impacts will fall on the licensees with the cost of revising those programs.

I think our challenge is to quantify what that cost is and the perceived benefit, so that we can do a fair presentation to the Commission.

MR. HODGKINS: Thank you, Ed.

Michael? Nothing to add? Larry?

MR. HAYNES: No.

MR. HODGKINS: Nothing to add? Brian? Roger?

MR. PEDERSEN: I was actually looking around for Dr. Meck. Earlier he kind of addressed this in terms of what he termed intangible benefits. So, I think we need to take that as a significant

takeaway, that maybe in discussing the benefits in the next SECY paper we have a section that we don't try to quantify, but we maybe amplify.

I think the list that Dr. Meck mentioned was the status of the U.S. in the field.

Ah, there he is. Were your ears burning because I'm talking about you? I'm speaking for you about public confidence and international alignment with technical practices. I am reiterating the list of intangible benefits that you had mentioned earlier, since we are talking about trying to identify what the potential benefits are.

In addition to that, we might want to try to stratify things out on short-term benefits and long-term benefits, things that would have the most immediate impact, even things that would have a longer-term impact. And I don't have a good list of those right now, but that's my input.

MR. HODGKINS: Okay. William, any comments to add to that discussion?

MR. SMITH: I thought about one benefit, and that only fits one of the objectives. That is to have the federal agencies consistent with some of the limits related to other changes.

MR. HODGKINS: Thank you.

Ralph, anything to add?

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

(Laughter.)

MR. ANDERSEN: Ralph Andersen, Nuclear Energy Institute.

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

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

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

about over a considerable amount of time, you know, right now, as we used to talk about, it requires a rule change to address changes in that, even where the agency has changed its policy in other areas. That might be an example of details that might be better captured in guidance or other documents, so that the rule can remain intact, where you could address changes and things like that.

That could be a very tangible benefit from the regulator's side. Because you are still going to use public comment, and so forth. I mean there's still a public process to monitor those kinds of changes. But, to always have to go to a rulemaking to address any emergent issue, I think you could avoid that by the way you restructure the rule.

MR. DEHMEL: Jean-Claude Dehmel, NRC.

A couple of things. One, if you look at enclosure 3 of SECY 08-01-97, there are two punchlists. So take a look at those as what we already have addressed/identified. So, just in your comments by January 31st, give us a delta. If there are certain things that are not listed in there that you think are important, then please augment that tabulation that is in enclosure 3 of SECY 08-01-97.

With respect to the cost/benefit analysis,

as I mentioned earlier, NRO is in the process of finalizing a new cost/benefit ratio. I believe that in a prior draft of the report they were thinking about a process by which there would be an automatic -- or a process built into Section 2(d) of Appendix I that would allow, in essence, the NRC to automatically update the cost/benefit ratio to the current dollars. I don't know whether or not that is going to remain in a final proposal, but that is being addressed. Recognizing that having to revise the cost/benefit ratio involves every time a rulemaking, which may not be necessary, there may be another way of doing it. So, that is being considered.

We have identified in that punchlist in enclosure 3 of the SECY paper a couple of items that attempt to address the fact that you have utilities with a large number of power plants and utilities with one or two power plants as far as the cost/benefit and the implications of changing the regulation.

So, I would like to spend a little bit of time on that, discussing that, whether or not -- does that make any difference? Would a utility with a large number of power plants benefit from some economy of scale in revising the procedures and the computer 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

while back from the Commission that alluded to NRC setting up the capability for electronic reporting for effluents. And it fell short of direction. It just sort of threw it out there as something that should be considered. I just don't remember what the specific issue is they were responding to where they threw that in.

But that would be another opportunity, is my point, for the NRC to capitalize on the fact of the rulemaking, is to do something similar like you did with REIRS for occupational exposure.

MR. CONATSER: This is Richard Conatser, NRC.

Yes, the collection of that data, the automatic collection of the data, that was related, really, to submittal of the annual reports by the licensees. That wasn't really for the individual calculations of permits or dose calculations, or anything like that. That was the annual reporting of the data.

And that was voted down as not being something we wanted to pursue because that would take additional rulemaking at that time. Now, if we wanted to pursue something like this, maybe we could at the same try to look at that type of thing. That is

something, I guess that might be a good point.

MR. HODGKINS: Any other feedback from the audience?

Yes, Roger? Ralph?

MR. ANDERSEN: To kind of close the loop on that, the simple story is the globe is moving to web-based data transfer. And that's the thought, is that that should be something else you ought to look at as a part of this rulemaking, would be changes that you would actually make within the NRC above and beyond just the standard updating to documents, and so forth, creating things that would facilitate your work, like web-based reporting, which would also benefit us.

I would just fold some of those in because that kind of thinking went into the last revision of Part 20; hence, REIRS.

MR. DEHMEL: Thank you.

So this is the last issue that is identified in The Federal Register notice. We are going to go over these things. So, some of this essentially is a recap, but there are other aspects that transcend the revision of the dose conversion factor, although the dosimetry basis of Part 50, Appendix I, numerical guides.

So, the first one, 4.1, numerical design objectives, we talked about this earlier. So, the bottom line is this would have to be synchronized with Part 20 under the current thinking that we understand that we are getting some feedback here that may perhaps urge us to consider another alternate avenue on this. This is fine.

But the thinking here on 4.1 is that we would synchronize it with the revision to 10 CFR Part 20. So, if it ICRP 103 as adopted in Part 20, that would become the basis of the numerical guides for Appendix I to Part 50. And again, if 103 is not adopted, then this would be normalized with the current Part 20 under ICRP 26 and 30. So, that's fairly straightforward, I think.

The other elements, 4.2, 4.3, 4.4, and 4.5, are, in essence, beyond the primary intent of this proposed rulemaking or these changes.

The first one, having to do with organ numerical design objectives, we know that in Section 2(a), 2(b), and 2(c) there are criteria for total body, all body, and specific organs. And the organs are mainly the thyroid and the skin and other organs, for example, the bone.

So, if we are going to move to an

effective dose or a total effective dose concept, one line of argument is, well, we don't need to worry about organ doses anymore. So, therefore, we could drop those numerical guides out of Part 50, Appendix I, and retain only those that are associated with the whole body.

On the other hand, given that there is a possibility of large releases of noble gases and iodines, which essentially might dominate in terms of organ doses and skin doses, given that possibility, should we retain organ doses, but only retain them for the purpose of thyroid doses and skin doses, and essentially ignore all of the other organs that are listed in the Reg Guide 1.109 model? So that is one issue.

The other one, on 4.3, having to do with the annual beta and gamma air doses for gaseous effluents, should we retain? This is the only set of criteria in Appendix I to Part 50 which is not expressed in millirem per year. It's in millirem per year; it's an air dose. It's an absorbed dose to the air.

So, the question is, should that, those two criteria, be retained? Should they be dropped? Should they be converted to an effective dose or a TED

dose on the assumption that somebody is located at EAB?

Section 4.4 has a broader licensing implication. The way the Appendix I rule is written and the guidance, it focuses only on lightwater reactors. We are now considering applications coming in for the first one most likely is going to be high temperature gas-cooled reactor, and there may be some other designs that are going to come; for example, molten salt, molten lead, and so on. Whether or not those are actually applications that we have to review as design certification, I don't know at this point.

But I know that it looks like in 2012 we are going to see design certification application for a high temperature gas-cooled reactor. I realize that we licensed two plants that way, Fort St. Vrain and Peach Bottom, using the current Appendix I, even though those are high temperature gas-cooled reactors.

So, should we take this opportunity at this time to consider a couple of things. One is add additional requirement under Part 50, Appendix I, and obviously expand the guidance, to, in essence, say that, as far as emission is concerned, meeting Appendix I requirement is almost insensitive to the kind of reactor technology, with the exception that

you may have a different set of radionuclides in a source term, both liquid and gaseous effluents, that you would expect to see if you were dealing with a conventional lightwater reactor. That is one approach.

Another approach might be to basically develop a separate set of equivalent Appendix I requirements for different reactor technologies. I don't know what this would look like. Now, obviously, this is just speculation at this point. So, we want to talk about that.

Item 4.5, compliance with requirements for licensed operation under 10 CFR Part 20, as you know, Appendix I requirements are on a per-plant basis. The way Part 20 is written, the concept of licensed operation is per, essentially, licensed entity. And that has some ramification with the implementation of 40 CFR 190 as it is identified in Part 20, 1301(e).

So, the thought here is that we would propose an amendment to that part of Part 20, and whether or not that amendment should be in a regulation or should be expanded upon the guidance, I am not really too sure. OGC would have to weigh-in on this.

But should a distinction be made in Part

20 -- and let's assume at this point for the sake of discussion this is a Part 20 issue, truly a Part 20 issue -- should we provide additional amplification in Part 20 that says, if you have one site that operates two reactors managed by two different entities, commercial entities, meaning that each one has its own docket, its own license, and they are both contributing to a dose, to a single offsite dose receptor, and they are competing for the same dose, in this case 100 millirem or 25 millirem under 40 CFR Part 190, how do we address this in revised Part 20? So, we should look at that.

And the issue here is there are some ramifications with 40 CFR Part 190 and the way it is implemented under Part 20 regulation on 20, 1301(e). So, this is another aspect that would need to be looked at.

So, what I would like to do now is just switch to the question and address these things one by one.

So, the first one has to do with -- and again, trying to keep this rulemaking simple, essentially, what we are saying at this point, should we evaluate all of these five items that were previously shown in a slide or target only on the one

that essentially would normalize the numerical guides in Part 50, Appendix I, to either ICRP 103 or ICRP 26 and 30, and leave all of the other requirements as they are today with no changes, thereby expediting this revision of Part 50, Appendix I?

On the second question, again, are there significant implications on how this would be implemented? So, you can see that the implication on the regulatory guidance perhaps may be greater. We may have to perhaps even expand the guidance. For example, right now, we have NUREG 0543 that addresses this. As we discussed earlier, this would be collapsed into one single NUREG. Right now, the focus is on, I believe the thinking is that, if you include boiling water reactors, if you have up to four plants at a specific site, and if you consider skyshine for the turbine building, if you consider radwaste storage, four plants would allow one to demonstrate compliance with the 40 CFR Part 190.

But that was before the time where ISFSI facilities were not in consideration, at a time storing of large components such as steam generators and other decommissioning components was not considered at that particular time.

So, the thinking is that the analysis that

was done in NUREG 0543 would have to be, essentially, revisited, and in addition to the traditional external sources of radiation you would see at a plant, we would have to consider these other types of sources, ISFSI facilities, extended waste storage facility, the fact that licensees may have to build interim a low-level waste storage facility for Class B and C waste in some instances. So these would have to be factored into this revised guidance.

So, if there are any significant implementation impacts on this or specific considerations that the NRC should be aware of when we approach this rulemaking process, or at least identify in the first step in our SECY paper that is going to be issued in October of next year, we look forward to receiving some insights and some suggestions from licensees and applicants.

So, with that, I would like to start addressing these things. And what I can do at this point is go back to that punchlist and maybe start taking these things one by one and assess what the thinking is, what the consequences are. Where do you think we should be going on this? Are there some ones that are more important than others? Should we focus simply on revising Part 50, Appendix I, numerical

guide, the underlying dosimetry concept, and ignore any of the rest of it?

I will leave it open to the panel.

MR. HODGKINS: Round robin? Ralph?

MR. ANDERSEN: Ralph Andersen, NEI.

You put a lot out there. So I'll try to be brief, and then we can address things later in written comments.

I think you ought to again look at the transition from the 10 CFR Part 100 criteria to the way that it was handled in rulemaking in Part 52, in which the values of 25 rem to the thyroid -- or excuse me -- 25 rem to the whole body, total body, and 300 rem to the thyroid were converted to a 25-rem TEDE value.

In the case of those criteria, the 25-rem TEDE value hypothetically created allowance of about 900 rem to a thyroid, if you do the math. And those types of comments came flying in. You know, the NRC was suddenly going to allow people to get 900 rem to the thyroid.

What NRC did, in response to those kinds of questions, is they actually looked at reality and considered that that's categorically impossible to 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

meets that, and how to design it in a way that meets that.

And I think if you went that way, then that puts you well-positioned to tackle issue 4-4, which is, then, you should be able to come up with a number that is technology-independent. Because, really, you are defining as low as reasonably achievable for the purposes of design. So, my question would always be, why would you have a different number for a different technology?

So, I would just suggest approaching those kind of in that sequence, looking at the three dose-related values and sorting out why those can't boil down to a single number, and then looking at the 4-4, as to why would you need different numbers for other technologies.

And then, finally, on the licensed operation issue, I do think it needs to be addressed. I would hope that it is addressed, as you suggested, in Part 20 thinking space, because I think there are a number of other issues for non-reactor licensees that would be similar in nature. So, I would just consider that, that the issue is broader than just two co-located nuclear plants owned by different people. As you mentioned, ISFSIs play into that, too. You have

got to consider the possibility of centralized storage. We now have centralized storage of low-level waste going on.

So, there's really a lot of factors that come in, but I think your fundamental question of how would you sort things out between somewhat or entirely different licensees is an important question, and I think it should be addressed. But I would defer over to the Part 20 discussion to go after that.

MR. HODGKINS: Thanks, Ralph.

MR. DEHMEL: So, that portion perhaps could be put on the punchlist in the revision of Part 20 and divorced from this particular rulemaking, if we were to proceed?

MR. ANDERSEN: I think that this area would be an input to that issue, but resolution of that issue broadly I just think would be conducted better with the whole panoply of NRC licensees, rather than seeing it as primarily a Part 50, Appendix I, issue.

MR. HODGKINS: William? Brian?

MR. LITTLETON: Really, I think I can best answer this group of questions by starting with what the agency is doing with our kind of somewhat linked standard of 40 CFR Part 190.

For that, right now, we are still doing studies, and we are conducting studies on various aspects. But we have not made any decisions on -- certainly, we haven't made a decision that we are going to revise it, and we certainly aren't predisposed to any direction particularly on any of the aspects.

It was mentioned in relation to 4-4 about what to do with, I guess, other designs outside of lightwater reactors. Again, that is one question that we picked up on because it would impact, I guess, how we go forward with any potential revisions with 40 CFR Part 190.

And so, we are doing some studies right now on how different are effluents from these technologies. And all I can say without -- I can say that the initial feedback that we are getting is that the effluents aspects are not that much different. Pretty much the same suite of radionuclides are coming from the high temperature gas reactors of one design or the other as from the lightwater reactors, although it may be slightly different percentages.

But, outside of that, we are still doing studies and we have got no direction in mind as of today.

There was mentioned, I guess, the issue of how you all would handle sites that have multiple reactors with maybe different operators. I think that is an issue which I have written down because the agency has not considered that yet. So, I will just say that it is something that we don't have any input on right now, but that I am going to go back and do a little bit of research on that issue.

There were a couple of there issues I might want to mention, but let me gather my thoughts on that.

MR. HODGKINS: Okay. Thanks, Brian. We will come back to you.

Larry? Michael?

MR. BOYD: Mike Boyd, EPA.

I don't know that this really affects Appendix I limits, but just to speak to Ralph's preference for one number to meet, I think just to point out that the reality at EPA these days is that any standards we write or rewrite will inevitably have a groundwater protection provision separate from other pathways. I think that is just the reality.

MR. DEHMEL: Jean-Claude Dehmel, NRC.

Groundwater pathway, that requirement will be embedded in the current 40 CFR Part 190? Is that

what you are implying or suggesting?

MR. LITTLETON: There are some initial thoughts that are saying that that's what we would do. If we were to go that route and put a groundwater pathway, it would be embedded into our existing 40 CFR 190, if we revise it. So, that is just the general thinking about where we are.

MR. DEHMEL: Okay. Thank you.

MR. HODGKINS: Ed? Carolyn?

Okay, anybody from the audience want to add to this discussion?

MR. MECK: Robert Meck, Science and Technology Systems.

No. 4-2 stimulated this line of thought. The objective is to provide an adequate level of protection. And the common normalizing factor for that is risk and detriment. I haven't really heard that considered.

But if you consider that if you had a guideline for what level of risk and detriment provides that adequate level of protection, then the organ and whole body and the air dose things sort of get folded into an evaluation of that, and it can remain a single number that provides a foundation for 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

at all the recommendations that were made this morning with respect -- for example, looking at option 3c, with revising all of the models, the dispersion model, the environmental transport model, atmospheric dispersion model, and so on.

And going down this list, so if we go that route, are we -- and this is posing a question now -- are we in a process by which we are changing the paradigm of Part 50, Appendix I, and as a result of this, we are in a complete different realm? Where initially we thought we were going to realign Part 50, Appendix I, in a context of, what will be done or what is being considered for 10 CFR Part 20.

So, then, does that open up now us to criticism and perhaps to more scrutiny in perhaps, then, the process by which we would make specific recommendations to the Commission maybe different than what is being envisioned right now for the revision to Part 20?

MR. HODGKINS: Ralph, do you want to go first?

MR. ANDERSEN: The change from ICRP 26 to ICRP 103 and Part 20 is not a substantial change in the risk paradigm. The change from ICRP 2, which was effected in 1990 in Part 20, but which we are really

talking about today for Appendix I, to any version, 26, 60, or 103, is in itself a significant change in paradigm because the scientific understanding didn't just change numerically; it changed conceptually.

So, in ICRP 2 space, the notion of being able to integrate risk comparatively between individual organs and the total body as an organism didn't exist in 1959, 1960, drawing on data which was still fairly young from the atomic bomb survivors. So, it just wasn't enough information to be sure about that yet, what the incidence of solid tumors was going to be over time. Leukemia was starting to sort itself out, but not enough, that we still felt a need to keep total body.

You know, there were a lot of things that went into why it is the way it is in ICRP 2 that changed fundamentally when we went to ICRP 26. So, as a starting point, Jean-Claude, if the Commission doesn't already get that, you ought to help them get that. It is a change in paradigm to go from ICRP 2 to ICRP 26, period.

Secondly, I think that what gets lost is -- and you said it at the outset, but I think it does get lost in the thought process sometimes -- these aren't limits that assure adequate protection of

health and safety. They are not. These define design features that represent as low as reasonably achievable. These are on the far end of the spectrum. And they set a threshold below which you consider additional actions that might be taken based on a cost/benefit ratio.

So, they provide objectives that you need to meet at a minimum to get you your license. I mean forget about the new 52 process. Let's just think back to the plants that are currently licensed and operating. You had to do at least that good.

But once you had done that good, the presumption was that the plant would operate with effluents that were as low as reasonably achievable by definition, unless it could be shown that there were other technologies that you could implement at a given cost/benefit ratio.

So, I anguish a little bit when I hear us struggling with integration of values and stochastic and deterministic effects, and things like that. We are not in that universe.

I know of no deterministic effect that occurs at 5 millirem per year to any organ or 25 millirem or even 75 millirem to any organ. We are not in that space.

The only reason you've got three limits in 40 CFR 190 is because that is what ICRP 2 offered at that time. If that rule hadn't been written until ICRP 26 came out, you probably would have a single value.

So, you know, I would suggest that, as far as extending the fact that you are changing the fundamental paradigm should set the stage for you to be able to propose additional reforms within the regulation that go well beyond that, as an extension of the fact of making a basic decision about changing the basic paradigm.

But I do think it is important that you communicate to the Commission, in case they don't get that, that that is a fundamental change.

MR. HODGKINS: Brian?

MR. LITTLETON: I also wanted to add some thoughts because our efforts are so very similar, whether we revise 40 CFR 190, again, along with any potential revisions that you all do for Part 50, Appendix I, or Part 20.

Some of our thoughts, because when we started talking looking at 40 CFR Part 190, the primary focus was the dosimetry and the outdated dosimetry that was in our regulation. But when we

started talking about unraveling it and relooking at it, then we actually started saying, well, why don't we go back to the original principles of this regulation? Because when we started talking details, there were some things that were inconsistent. Some of the assumptions are inconsistent. Some aspects of our regulation were just, you know, we didn't like, so to say, and I won't go into any details.

So, we had to go back and started looking all the way back to the original principles and saying, okay, well, if we keep these principles -- so we wanted to keep those four guiding principles. There are four guiding principles. Then, if we kept those principles, can we relook at and develop a better standard? And we have provided some of that feedback to our management for them to make a decision on which way we should go here.

But we wanted to keep the principles, but we found it was impossible to separate, I guess, just a small dosimetry update from going and looking at the total rule because the reality of the situation is that, if we just do a dosimetry update, and that's the only thing that we do to 40 CFR 190, then we may never look at this rule for another 20 or 30 years. And we didn't think that that was the right viewpoint to take

as well.

So, we thought that if we are going to go back and take a look at it, then we probably need to take a look at everything in there and then make a decision on what we are going to do.

So, it is something that we are struggling with as well. So, I can't provide you with any definitive direction there, but just some of our initial thoughts.

MR. DEHMEL: Jean-Claude Dehmel, NRC.

This is a question for the EPA. So, it looks like -- this mic is very good -- it looks like we may be ahead of the EPA in trying to amend our regulation. I mean that is the way it looks like right now.

We are going to get a SECY paper to Commissioners at the end of next year. And then it's possible that we may be given a specific recommendation to proceed in 2012, 2013.

I don't know what the timeframe is for the EPA. But let's kind of look into the future now and say, well, let's assume the NRC essentially is out of the gate first. We are marching along the way, and we stumble across now there's this coherence between EPA regulation 40 CFR Part 190 and our requirement in Part

50, Appendix I, and actually Part 20 implementation of the 40 CFR 190 limit.

How would we proceed at this point? Would the NRC be essentially kind of almost held hostage until we wait for the EPA to make a decision? Or could we simply have, for example, an MOU with a technical attachment that would essentially serve as an interim measure in addressing these technical differences between 40 CFR 190 and however we end up revising Part 50, Appendix I?

MR. LITTLETON: Thank you for the hot potato.

(Laughter.)

Well, I think that there's a premise that you all are a little bit in front. Although it may sound like it, I guess I would say that if we choose to revise the standard, I think our efforts are pretty much synched.

We started talking about, I guess, internally that if we do choose to go this route, an ANPR of sometime around maybe the late spring or early summer, and then maybe a possible proposal to come out for this maybe sometime around fall or winter of 2012.

So, the good news is that I think the efforts may be synched up pretty well, if things come

about in a timely fashion.

But I guess, regarding the other aspect of that, of your question, it is kind of hard for me to answer. I know there are a lot of -- I guess our OGC would answer it in one way. I would think that they would say that, whatever we come out with on 40 CFR 190, then, you know, it doesn't matter what the NRC has; they are going to have to consider and take it into account as far as implementing these standards.

So, that is a touchy issue. It would probably take a group of our attorneys and your attorneys to get to the bottom of it. That is generally what has happened in the past. I guess that is my answer.

As far as the timing thing, I think things look good. The other aspects of it, coordinating that, you know, hopefully, if the timing works out, it won't be an issue. If it doesn't, then we are talking about pulling our attorneys in, and I'm not an attorney.

MR. DEHMEL: Does that mean that -- how are you going to fold this with this effort, if you are going to include groundwater, how are you fold this with the Office of Drinking Water? How is that going to work?

MR. LITTLETON: Well, the drinking water, when the agency determines that we are going to revise a standard, we send out invites for a formal work group internally within the EPA and invite folks for any affected office. So, anything that we come out with, certainly, we would come out with a proposal, maybe not at the time of the Advanced Notice of Proposed Rulemaking because that is just getting input from the various stakeholders, but definitely when we come out with a proposal, we have taken into account, I guess, probably most likely the Office of water and their desires as far as what we should put out in any proposed rule. So, that will be taken into account.

MR. DEHMEL: Thank you.

MR. HODGKINS: Don?

DR. COOL: Don Cool, NRC.

To pick up on that, and another question that you may not be able to answer now, but to put it out on the table, we have been talking over the last few amounts about the paradigm and a shift that would move to effective dose, which pulls together doses from various pathways of exposure to various organs or components of the body, and assembles that into a single, more or less, risk-informed -- I'm not going to say risk-based necessarily -- value that we

measure.

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

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

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

into effective dose.

How do you reconcile that discrepancy? It's the hot potato with chili.

(Laughter.)

MR. BOYD: Not knowing who is on the webinar, I am going to tread bolding into this O.K. Corral.

I think the last time we stood off facing each other, we blinked first because you got a license termination rule and we did not get a cleanup rule. But the issues are still there. The arguments are still there. And frankly, the statutory requirement for anti-backsliding under the Safe Drinking Water Act is the gorilla in the room that has to be dealt with.

We would like effective dose, we at the staff level. I'm not speaking for the agency, but we at the staff level would definitely like to regulate using effective dose. But the lawyers and the congressional mandates sort of stand in the way at times.

DR. COOL: Just out of curiosity, is 40 CFR 190 issued under the Atomic Energy Act or the Safe Drinking Water Act, or both? I thought it was the Atomic Energy Act.

So, not being a lawyer, I wonder why the

legal provision of the Drinking Water Act, which is not within the Atomic Energy Act, would have to apply in this case?

MR. ANDERSEN: Can I try a couple of things just real quick?

I'll make some bold -- since I'm not a lawyer, I can always make these bold assertions, and then, unlike Don on Monday, my lawyer isn't sitting in the back of my room.

(Laughter.)

One is I know of no statutory authority for EPA to apply the back-sliding act to groundwater. It doesn't exist. That is a matter of agency policy.

The back-sliding provision applies to safe drinking water, and you have defined what safe drinking water is in your regulations. You know, it is commercial water providers that have -- what? -- more than 20 outlets, or something like that.

I appreciate and understand what EPA has done as a matter of policy for groundwater protection, and I appreciate that, undoubtedly, if you go through a rulemaking, you are going to end up with a Safe Drinking Water Act provision.

But, just for everybody else's edification, I didn't want them to mistake that, think

that that is at the direction of Congress. It's not.

Two is that I don't believe that the fuel cycle standard -- 40 CFR 190 I believe was actually issued under Reorganization Plan No. 3, not under the Atomic Energy Act. I don't recall that EPA has any authorities at all under the Atomic Energy Act. I don't think EPA is even in the Atomic Energy Act.

I thought those standards were issued as part of your authority to issue generally-applicable environmental standards when the EPA was created under reorganization, which was eventually codified in a 1994, I think it was -- I've got the dates wrong -- 1974 law that essentially adopted Reorganization Plan No. 3. But just for clarification.

MR. BOYD: Well, it was Reorganization Plan No. 3 that transferred authorities to EPA, but the authorities were included in an amendment to the Atomic Energy Act where it says, anywhere in the Atomic Energy Act where it says "the Federal Radiation Council", it now says "the Administrator of the EPA" and things like that.

So, we are in the Atomic Energy Act as responsible for setting generally-applicable standards.

MR. ANDERSEN: Even better than having a

lawyer in the room.

(Laughter.)

MR. HODGKINS: How are we doing with that discussion? I guess we've got a webinar participant question.

Again from Cindy Bloom. Thanks, Cindy, for sticking with us.

"Agreed that 10 CFR 50, Appendix I, incorporates ICRP 2, which focuses on organ dose limits, but I was under the impression that an update to at least ICRP 26, 30, if not 103, was a given in this discussion. Am I mistaken? Is keeping the status quo a considered option for the 10 CFR Part 50, Appendix I?"

MR. DEHMEL: Jean-Claude Dehmel, NRC.

Yes, it has been retained as a status quo option. Yes.

Again, at the staff level, our recommendation would be to revise ICRP 103, but that decision is going to be made by the Commission.

DR. COOL: To elaborate on that just a little bit -- Don Cool from NRC -- even without our lawyers in the room, the first option is always you don't have to do anything, to maintain the status quo. So that is certainly one possibility.

Then, the question is, is that the best possibility, given all the information that is available? What are the pros and cons of moving to any one of the other options?

So, the reason that we are having some of these discussions is that, in light of the many changes in the science, in the methodology, in the approaches, does it make sense to move from the status quo, the existing regulation, to something else?

And I will take this opportunity to very briefly just go back and touch what I think may have been her earlier web question, which had to do with the organ doses versus the effective dose in ICRP 26, and then, as that gets translated forward, in ICRP 60 and ICRP 103.

It is true at occupational dose levels, depending on the radionuclide, because of the differences in the sensitivity to developing cancer, that enough radioactivity material could become concentrated in an organ to cause direct deterministic effects in that organ before you would reach the cancer induction threshold, which is the equivalency that is used to form the effective dose.

Now, for the most part -- in fact, I think entirely -- when you move to lower levels of effective

dose, so that you are no longer at the occupational exposure levels of 5 rem or 2 rem here, but, rather, you are down now in the levels that we are talking about for Part 50, Appendix I, of 5 rem, 5 millirem, not 5 rem, three orders of magnitude lower.

And look at that equivalency in effective dose, and you look across the various tissue weighting factors. You find that it is no longer possible for there to be a sufficient accumulation of a radionuclide in those models to cause any other effect. So, in fact, at those kinds of levels, it is the effective dose that always ends up being the controlling factor in the analysis.

Hence, why you see the question as to whether or not it is necessary to continue with other organ doses because this modeling methodology -- and I would invite anyone else to chip in -- but this modeling methodology suggests that, at these kinds of levels, you can't get organ doses that are of separate concern.

MR. HODGKINS: Any reactions?

DR. COOL: I hope that helps Ms. Bloom.

MR. HODGKINS: Huh?

DR. COOL: I hope that helps Ms. Bloom.

MR. HODGKINS: Okay. Any reactions to

that? Any reactions, again, from the audience?

(No response.)

Okay. From the panelists?

(No response.)

Are we ready to move on then? Discussion is good?

Then, I think Question No. 5, really, it's just opening it up to the entire group as far as, is there any lingering questions, any comments, any last wishes in this discussion that I wish we could have discussed or it would be nice to have heard or here's what I'm thinking and it wasn't addressed?

And No. 1 is closed down (referring to microphone). We've got to go to No. 2. We have someone at the microphone. Thank you.

MR. WRIGHT: This is Tim Wright. I'm speaking as a private citizen, not as somebody from Duke Energy.

I would like to address this last salvo of discussions between the EPA and the NRC. As a private citizen and as a taxpayer, I would strongly encourage you guys to play together and come to some consensus to not fight each other on these issues because, when you do that, you're wasting my taxpayer dollars.

MR. HODGKINS: Thank you. A wish.

Michael?

MR. BOYD: I just want to say I was referring to some old fights that everybody is familiar with and the legal reasons why some of those issues don't go away.

But, just speaking personally now, I'm getting along great with my NRC counterparts, and we are doing much better than we used to. Thank you.

MR. HODGKINS: All right. Wonderful.

Roger?

MR. PEDERSEN: There is an issue that we haven't really brought up, and that is, should we be couching any change to Appendix I in terms of an implementation of the concept of constraint that is in 103?

I have heard Appendix I being used as an example of where we, in fact, use a constraint, but that is not what Appendix I was originally designed for. The concept of constraint wasn't even there.

And if we do that, is there maybe some downside to doing that? You know, whether that is a good idea or not, since the ICRP uses a concept of constraint in at least three different ways that I know of in the document?

One of them is the value at which, as I

said yesterday, you pre-determine that you might not be ALARA. And the current numeric values in Appendix I are viewed that way, because there is an ALARA provision in Appendix I below that.

One of the other uses of the term "constraint" in there is the value that would be applied to separate sources, so that the sum of the doses from those separate sources would be ALARA to a member of the public or a single individual who was exposed to those separate sources. And if you look at it that way, that sounds similar to what 40 CFR 190 is attempting to do.

I guess I'm bringing that up. Should we try to couch these changes in terms of implementation of a constraint concept, and being overt about that, or just ignore that whole concept and do what we need to do in terms of changing the dosimetry and numeric values?

MR. HODGKINS: Any reaction to that from the panelists?

Brian?

MR. LITTLETON: I had the idea of constraints in the back of my mind -- this is Brian Littleton with the EPA -- when we had internal discussions regarding groundwater provisions. And

then, knowing the past history between EPA and NRC on this issue, and that has been that the NRC has been reluctant to enforce a separate groundwater standard because they believe that, I guess, protectiveness to the whole body is protective enough. That is kind of just a real blunt type of explanation of some of the previous discussions.

I don't know the extent to which that is changing. We, obviously, have the NRC's Groundwater Task Force that has been convened to look at the problem of groundwater coming from some of the nuclear power plants and other facilities.

So, I think there is a change, but I'm not sure how far that change is going to go, if that is going to be a wholehearted acceptance of maybe a separate groundwater protection requirement or if it is just I guess studies. I'm not sure what the endpoint is.

But I did look at the issue of constraints and had that in the back of my mind as one way that, if the NRC did not accept, I guess, the charge of protecting groundwater, that they might be able to say that we are being protective of this, of the agency's, you know, any agency MCL that may come down for groundwater because we have included, I guess, some

sort of provision -- and I am not sure how that would be worded -- as a constraint in maybe Appendix I. That was a thought that was in the back of my mind.

I am not sure how that would happen. I think there would probably be quite a few meetings between the two agencies before that came about. And it is not salient right now because we don't have a separate pathway as far as nuclear power operations facilities are concerned right now.

MR. HODGKINS: Thank you, Brian.

Ralph, did you want to add something?

MR. ANDERSEN: Ralph Andersen, NEI.

I just wanted to pick up on Roger's comment that, yes, I do think that is something that ought to enter into the thinking. You know, our new nomenclature in radiation protection space ought to be well-defined. And if we are going to have a third category called "a guideline", we ought to be able to distinguish that category from limit or constraint. That ought to be something that is taken into consideration in the rulemaking. Or, alternatively, if we are going to consider these things to be constraints going forward in the future, then we ought to capture that as well.

But some of the stumbling around we have

done over the years has been around the notion that we are not quite sure what these things are. We know how to use them, and we have used them very well, but they kind of defy definition.

So, I do think that would be a good thing to address, both in the SECY paper and in the ultimate rulemaking, is create the category that they belong in, define the category, and then we know how they fit into the regulatory scheme.

MR. HODGKINS: Thank you, Ralph.

Any other reaction from the audience?

(No response.)

From the panelists?

(No response.)

Then we have a webinar question from Cindy Bloom once again.

"So you only use the stochastic ALI? It seems like EPA uses non-stochastic ALI."

Yes, Michael?

MR. BOYD: I don't know what a non-stochastic ALI is. I think it is all based on stochastic, isn't it? I mean the ALI is supposed to be the amount that you can take in in a year that would meet, I guess, nominally, the 50-millirem number in Appendix B?

But another display of ignorance. So I will let either the lawyers or the other HPs in the room correct me.

My recollection is that the derived air concentrations and the allowable limits on intake actually are the most restrictive of either the concentration that would hit the effective dose equivalent level or the committed dose equivalent level.

Isn't that right, Roger? Yes, it's the more restrictive of the two. So, in some cases, they are actually deterministic-based. That is especially true for some of the transuranics, if I am not mistaken, that they don't actually equal 5 rem total effective dose equivalent. They actually equal 50 rem to a particular organ.

DR. COOL: Don Cool.

That is correct at the occupational level. And what I was trying to point out is, when you, then, move to the lower levels of dose and do the division by 10 or 100 or 1,000, the connection no longer gets you back to a committed effective dose for an organ that would be limiting. They all, then, relate to the cancer incidence projection, which means that they are all the stochastic values, as I recall.

MR. HODGKINS: Ralph?

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

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

(No response.)

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

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

And, Carolyn, because I haven't started with you in a while -- Ralph's been hogging -- I'll start with you as far as that process, what you think, 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.

I would have liked to have had more power reactor representatives here from our peers. Hopefully, there's some on the webcast that we don't know about and we'll get some feedback from those folks as well.

MR. HODGKINS: Excellent. And they still have until January 31 to make some comment.

Brian?

MR. LITTLETON: I think the process here was very good. I actually took home, between the three days, I took home quite a few points that will help me out in my job of determining whether we are going to forward with revising 40 CFR Part 190 from the conversations that happened the previous two days and today. So I think it was very helpful for me and, hopefully, helpful for others out there on the phone as well.

MR. HODGKINS: Roger?

MR. PEDERSEN: You must have handed me a dead battery?

MR. HODGKINS: I did.

MR. PEDERSEN: Yes, I think this structured, open discussion is an outstanding format, particularly at this stage of what we are doing, which is mostly brainstorming as to collecting ideas,

collecting input, collecting information from sources that we don't readily have access to.

Unfortunately, as Larry said, there weren't more operating reactor folks here, but I believe that has to do with outage schedules and stuff. So the timing of that was unfortunate, but we will work through that.

And, you know, I heard some comments about, and I made a few of them myself, that the answers to the questions that were posed depends on the answers to other questions as they get resolved. So, I assume that this is somewhat of an iterative process. Maybe not this exact format, but we will be provided many more opportunities for stakeholder input as we go through the process.

MR. HODGKINS: Absolutely.

William?

MR. SMITH: William Smith, Southern Nuclear Company.

I like the process, and I think it went real well. By having the different questions, it kept us focused.

But, again, like Roger mentioned, when the answer is dependent on something that we don't know what the answer to it is, it is hard to answer that

question right now. Probably I don't know how you could change that though.

MR. HODGKINS: Okay. Ralph? Exit comment?

MR. ANDERSEN: Yes, Ralph Andersen, NEI.

I thought that it went exceedingly well. I really thought that the structure really facilitated a good interchange and getting all the views out on the table. So, from a process point of view, I thought it really went well.

The only suggestion I would offer is, not knowing what your attendance might be outside the Beltway since we are actually inside the Beltway right now, when you go to LA and Houston, I would suggest adding one additional slide to Don's presentation on the very first slide. Look at the background information in The Federal Register notice, and I would have a fundamental slide that basically says what is Part 20.

You may have members of the public attending in either LA or Houston that aren't going to -- Don's first slide right now starts talking about which vintage of ICRP we use. And it struck me that you might want to have an introductory slide that says what is the regulation we're talking about and what's

it for. And like I said, your writeup in the FRN gives the right bullet points.

MR. HODGKINS: Excellent.

Jean-Claude, did you want to add anything to the comments? Did you get what you needed? Yes?

I'm going to turn it back over to Don.

One parting comment, I would say, as far as someone from the outside looking in, your parents have got to be really proud of you because the language you guys have been using, if one of my kids came home saying some of the stuff I heard, I would be damned proud of you.

(Laughter.)

DR. COOL: Thank you very much.

We, the NRC staff -- and I think I can speak for all the different pieces of the organization that are here -- very much appreciate the time that each of you has taken, travel hours and otherwise in a number of cases, to come and help us understand better some of these issues.

This is not your last chance. So this is yet another reminder. You say it again. You tell what you told them. Then you tell them what you told them again. This is the I'm telling you what I told you and saying it again.

Because when you leave today and you ride the Metro back or you drive back or you climb on the airplane, or whatever it is, and you think of some additional things and you ponder it, we invite you, encourage you, almost beg you, to write it down and send it in. Because the whole point of gathering this information is to try to help us see as many of the issues from as many points of view as possible.

What we are trying to do is assemble all of that, so that we can have the best possible recommendation with all of the different vantage points as possible.

So, please, send us in additional things. Send them to our email address, which is in that Federal Register or various and sundry other things.

In addition to that, by NRC standard protocol, I have to remind all of you that we would love to have feedback forms, if you had some additional feedback or if you decided to wait until today to do that, in addition to the round robin that we have had here in terms of how this worked.

We will be doing this twice more. We will be out in Los Angeles next week, and we will be down in Houston the week after that. So, we will be well outside the Beltway, and it will be very interesting.

Thank you for the suggestions, and if you have got any other additional ones, we have got a day or two to tweak them a little bit.

The record on our public website available in our document management system will include all of the slides, including things that were created here and couldn't necessarily be handouts. Those will be available publicly within a few days after we can get those back into our document management system, so that everyone will have an opportunity to see that.

The meeting has been transcribed. That will take a little bit longer for our court reporter to be able to go through and sort it all out, and figure out all of the acronyms and otherwise that we have tossed about the room. But those will eventually also be publicly available, so that you can go and read them.

I have had a couple of people ask me whether or not those are going to be available before the LA meeting, and I wouldn't count on that.

But, with that, I thank you very much.

I don't think I have forgotten any specific things.

I wish you careful travels on the wet roads in D.C.

Thank you very much.

(Applause.)

(Whereupon, at 2:29 p.m., the proceedings in the above-entitled matter were adjourned.)