US Department of Health and Human Services
Centers for Disease Control
National Institute for Occupational Safety and Health
Advisory Board on Radiation and Worker Health
137th Meeting
Wednesday, December 9, 2020

The meeting convened via teleconference at 1:15 p.m. Eastern Standard Time, via Videoconference, Rashaun Roberts, Designated Federal Official, presiding.

Present:

Rashaun Roberts, Designated Federal Official
Henry Anderson, Member
Josie Beach, Member
Bradley P. Clawson, Member
R. William Field, Member
David Kotelchuck, Member
James E. Lockey, Member
David B. Richardson, Member
Genevieve S. Roessler, Member
Phillip Schofield, Member
Loretta R. Valerio, Member
Paul L. Ziemer, Member

Registered and/or Public Comment Participants:

Adams, Nancy, NIOSH Contractor
Barrie, Terrie, ANWAG
Barton, Bob, SC&A
Buchanan, Ron, SC&A
Burgos, Zaida, NIOSH
Calhoun, Grady, DCAS
Cardarelli, John, DCAS
Fester, Joshua, On behalf of Petitioner
Fitzgerald, Joe, SC&A
Gogliotti, Rose, SC&A
Lewis, Greg, DOE
Naylor, Jenny, HHS OGC
Nelson, Charles, DCAS
Rutherford, Lavon, DCAS
Sisko, Jeannie
Taulbee, Tim, DCAS

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Proceedings

(1:15 p.m.)

Welcome

Dr. Rashaun Roberts, DFO

Dr. Roberts: So good afternoon and welcome, everyone. I'm Rashaun Roberts. I'm the Designated Federal Official for the Advisory Board on Radiation and Worker Health.

Welcome -- okay. It sounds like someone's not on mute. I'm hearing some pages turn. If everyone could just please make sure that we're muted. Okay. No. I can still hear background noise. If everyone could please check their phones and make sure that we're muted so I can move forward.

Okay. So welcome to the second and final half of Board meeting 137. Like yesterday we need to over a few preliminaries. If you are just on the telephone line, all of the materials for today, the meeting agenda, presentations and other documents, are all posted on the NIOSH website for this program under Schedule of Meetings for December 2020. You can go there and read all the materials, and you can follow along with the presentations. Materials were provided to the Board Members and to other staff prior to this meeting.

If you look at the agenda on the website, at the top there is a Skype link which will enable you to watch the presentation through Skype. I want to advise you however that you'll be only able to speak to the group and to hear the presentations through the telephone line, so you should not hook into Skype audio.

In order to keep everything running smoothly and

everyone speaking can be clearly understood without interruption, I ask each of you to please mute your phone, of course unless you're speaking. If you don't have a mute button, press *6 to mute. To take yourself off, press *6 again. And because we will be unable to see each other for the meeting, please identify yourself before your comments or questions.

Let's address conflict of interest for this Board meeting session. As you may see from the agenda, the main focus of the discussion today is largely the Savannah River Site. None of the Board meetings -- members for the record are conflicted for this site, so none of them will need to be directed to disconnect from the meeting today.

So with that important piece of business squared away, let's go ahead and move into roll call now, and I will start with the Board Members in alphabetical order.

(Roll call.)

Dr. Roberts: Okay. Very good. So thank you and welcome everyone. Let's prepare to move further into the agenda. Again if you would just kind of on a regular basis check your phone and mute it. Again, if you don't have the mute button, use *6 to mute, *6 to un-mute.

So we're now ready for the SEC petition status update and overview of the SEC qualifications process presented by Mr. LaVon Rutherford.

LaVon, over to you.

SEC Petition Status Update

Mr. LaVon Rutherford, NIOSH

Mr. Rutherford: Okay. Thank you, Dr. Roberts. Can everybody hear me okay?

Member Beach: Yes.

Mr. Rutherford: Okay. Good. All right. As Dr. Roberts mentioned, I'm going to do the SEC update, and I'm also going to do a presentation on the qualification process. I'll stop after the update and give a few moments for any questions during that, and then we'll proceed.

Okay. We do this update at every Advisory Board meeting, give the Advisory Board an indication of petitions and qualifications under evaluation currently with the Advisory Board and potential 83.14s. It helps them prepare for future Work Group meetings and future Board meetings as well.

To date we've had 258 petitions. We have two petitions that are in the qualification process at this time. We have one evaluation of a new petition that's in progress, and we have 11 reports with the Advisory Board.

The two petitions we have in Qualification 1 is the Rocky Flats petition. I think I spoke about this petition previously. We had previously determined that it did not qualify, and an administrative review was requested. That administrative review panel came back with a recommendation to provide additional information. We have provided that additional information. The slide says we did it in November. However, actually we did not do that until December. I believe she received it on December 3rd.

Another petition is the Pantex Plant is in qualification. We are just about to finalize that qualification determination. We expect to have that completed in the next week or so. That's for a period of January 1992 through December of 2000. Those of you will remember that we have an SEC class that goes up right up against that.

Petitions under evaluation. We have a Pinellas Plant petition for 1957 through 1990. This petition did qualify. A lot of you will remember that we have had a number of petitions for Pinellas Plant. However, we have not had the information provided to qualify the petitions. We also went through a detailed Site Profile Review with Pinellas. And this most recent -- I obviously have something pushing my slides forward -- but this most recent petition identified an issue that we are dealing with at Los Alamos and the Savannah River Site that ultimately qualified that petition and moved it forward. So that is something that we will definitely have in our evaluation.

Lawrence Livermore National Lab. This is an addendum that addresses the remaining years in the existing petition. Most of you will remember that this expected completion date has moved out a number of times. We have been trying to get on the site to complete a data capture to address one issue that we've been working on, however, due to the pandemic we've been unable to get on the site. So at this time we have a completion date of March of 2021, but it may shift as well.

All right. Since it jumped right to Y-12, I'll go ahead and discuss that. This again is a petition that we have years remaining of 1987 to 1994. We did have a Y-12 update yesterday, and we are working this issue -- or the addendum. The one thing I wanted to point out when I prepared my presentation, I

don't know where I came up with that February date at that time, but the -- based on responding to the petitioner's presentation at the last Work Group meeting and completing our interviews, that completion date is out till mid-next year.

Okay. So petitions under Advisory Board review. We have the Hanford petition. Most of the SEC issues are closed out. We are working on starting the work on the co-exposure model. That will be the last major issue to address with that petition. I believe that happens sometime in -- later this month or January, if I remember correctly.

Savannah River Site. That will follow after my presentation today.

Los Alamos National Lab. Ms. Beach spoke to that yesterday, and we are working a couple of papers to provide to the Advisory Board Work Group. And I owe her a schedule update, which will -- I should have tomorrow.

Sandia National Lab. We just received SC&A's -- we had received a copy of this, but it was not releasable. We got SC&A's review of the NIOSH addendum, and we are working on responding to that.

INL. We got an update yesterday.

Argonne National Lab - West. Again, we're working to resolve issues raised by SC&A and the Work Group.

Area IV Santa Susana. We got an update yesterday.

Metals and Controls. As Ms. Beach indicated yesterday, we're working on providing some additional information to the Work Group and hope to have that in the next few weeks.

De Soto Avenue Facility. Again, this update occurred yesterday, so I'm not going to add much.

And then Reduction Pilot Plant. The Reduction Pilot Plant evaluation report was presented to the Board. The Board sent that to SC&A to review, and so we are waiting for SC&A's review on that.

So these are the time periods that we have openings in existing SEC petitions, Hanford, Savannah River Site, Los Alamos, Sandia, INL, Lawrence Livermore, Argonne National Lab - West, Area IV, Santa Susana, Metals and Controls, De Soto, and Reduction Pilot Plant.

Potential 83.14s. We have the West Valley Demonstration Project. A lot of people remember that we actually added a class for that, however, we had data from a 1966 to '68 period that we were still evaluating. We are still in that evaluation process. We have a large number of documents that we'd received from a data capture, so we have not completed our determination on that.

And that's it for the SEC update. Do I have questions from that?

Member Clawson: Yeah, LaVon, this is Brad. Go back to your Savannah River on that date. You've got 19 --

Mr. Rutherford: I've got 1973 --

(Simultaneous speaking.)

Member Clawson: Yes, I thought that it was '72.

Mr. Rutherford: I think it's probably the -- I will have to check that.

Tim, can you weigh in on that? Am I wrong?

Dr. Taulbee: Yes. No. No, Brad is correct. It should be October of 1972.

Mr. Rutherford: Okay. Well, there you go. Good catch, Brad. I will get that corrected and --

(Simultaneous speaking.)

Member Clawson: Well, I just -- it just kind of threw me off there for a minute there. I just -- it's just there, you know? That's -- I understand what's going on. Thanks.

Mr. Rutherford: Mm-hmm. Any other questions?

All right. If there's no other questions, I'll go into the SEC qualification process.

All right. I'm going to talk about the SEC qualification process, and then I will talk about process improvements that have been made either through by petitioner input, Advisory Board Work Group recommendations, and also from admin panel reviews and findings and recommendations. Then I'll finish it up with some things that we're adding based on recent petitioner concerns and some admin review discussions.

A brief overview of the SEC petitioning process from the beginning to adding a class.

The petition, you have petition submission that starts the process. When a petition is submitted, it will go through the qualification process. If the petition qualifies for evaluation, we will evaluate that petition. Then we submit that Evaluation Report to the Advisory Board. The Advisory Board will then review that Evaluation Report and provide a recommendation, and that recommendation along with the NIOSH Director's proposed decision is sent to the Secretary.

Now if we're recommending a class, the Secretary will go through the HHS designation to -- and then if we're designating a class, that recommendation from the Secretary then goes to Congress. However, if the determination that dose reconstruction is feasible and we're denying the class, it stops at the HHS Secretary.

Just for people listening on the phone that want to file a petition, we have information on filing a petition. Forms can be found on our website, and you can also contact our SEC petition counselor. There's his number and email address, Josh Kinman.

Forms are optional. And I think some people don't know this, but -- forms are optional, but the forms do provide guidance as to what type of information will be used by NIOSH to qualify a petition. Believe it or not, we have had petitions -- we had a petition on a piece of paper that -- for Y-12 that was steamfitters, pipefitters, and plumbers cannot be reconstructed, and ultimately we qualified that petition and moved it forward.

Form A should be used -- somebody has -- needs to mute their phone there. I hear papers rolling.

Okay.

Dr. Roberts: I can still hear the typing. Please mute.

Mr. Rutherford: Yeah. Okay. Sounds like we're good now.

So the forms are optional and provide guidance as to what type of information will be used to -- by NIOSH to qualify a petition. A Form A should be used if NIOSH has notified the claimant/petitioner that a dose reconstruction cannot be completed. Form A is associated with the 83.14 process. And

when we notify a claimant or -- that a dose reconstruction cannot be completed, we provide that Form A for them to sign and send back to us.

Form B should be used if a petitioner believes a class should be added and are requesting NIOSH evaluate a class for addition to the SEC under the 83.13 process. That's pretty much what we call a standard SEC petition.

Qualification process. Once a petition is submitted, it is reviewed to determine whether it meets the minimum requirements established in the SEC rule. In order to qualify for evaluation, the petition must include identifying and contact information for the petitioner and a proposed class definition.

The class definition should specify a single DOE or AWE facility, locations at the facility that are included, job titles and/or job duties of the class members, and periods of employment relevant to the petition. We can always work with the petitioner on getting a proper class identified.

The key item that a petition needs to have is a description of the basis for believing records and information available are inadequate to estimate the radiation doses based on one of the following: a lack of monitoring; destruction, falsification, or loss of records; expert report; scientific or technical report; and exposure incident involving a high level of radiation dose. Any one of those five would qualify a petition to move forward. Documentation or statements in the form of an affidavit must be provided to support one, two, and five. I want to talk a little bit about each one of these.

A lack of monitoring. If a petitioner provides an affidavit that says to the best of my knowledge there is no thorium monitoring data at X facility

during this period, if we go in and we look and we say, you know what, there is no thorium monitoring data during that period, we'll qualify that petition and move it forward. However, if we have this affidavit and we go in and we find that we have monitoring data, then that affidavit is not supported by the evidence, and we will not qualify the petition.

So an affidavit in and of itself is not necessarily going to qualify a petition to move forward. If the evidence supports what that affidavit says, then we'll move it forward. But if it's not supported, then it will not qualify. That goes for destruction, falsification, or loss of records as well as the exposure incident if an affidavit is used to support that.

An expert report is a report from a health physicist or other individual with expertise in dose reconstruction. This report specifies the basis for believing that documented limitations might prevent the completion of dose reconstructions. And we have had a number of petitions that have qualified on the expert report. They've used SC&A site profile review as those will identify issues that would support moving a petition forward.

Scientific or technical reports are published -- are issued by government agencies that identify dosimetry and related information that are unavailable.

Okay. And as I mentioned, exposure incident.

We work closely with the petitioner during the qualification process to develop relevant information explaining deficiencies in the petition and to aid in submitting any needed materials. You know, I want to talk a little bit more about this.

When we have -- the petition comes in, we review

the petition, we review the basis provided by the petitioner, and we set up a consultation call to get clarifications and we identify issues we need clarified, things we need clarified, and we also identify deficiencies. For example, if a basis -- a good basis is not provided.

We also during that discussion we help work with the petitioner to identify which bases we feel they're -- what they've identified it would be -- would fit under. But I also want to point out that for every basis that is provided to us, we look at any one of these five things, these five bases to see if it supports. We don't say okay, if a petitioner says I'm going (f)(1), I'm going to do lack of monitoring, and we say okay, well, we're going to look at everything, we're going to go through destruction, falsification of records, expert report, and to see if it really would qualify under one of those. So I want it to be pointed out that we don't just go by what the petitioner says. We look at all of the different bases to try to qualify that.

Okay. I want to talk a little bit about some of -- to date we have 258 petitions that we've received. As I mentioned earlier, 103 have not qualified. Below are the reasons, the main reasons they did not qualify.

Again, you can see that the biggest reason that a petition does not qualify is because we have not got a qualifying basis that's supported by the evidence. You see we've had petitions that have been voluntarily withdrawn by the petitioner, and almost every one of those, in fact I believe every one of those, was early on after the rule was promulgated, and they were waiting on their dose reconstruction. And once they got their dose reconstruction they withdrew the petition.

Covers an already existing SEC class. We've had a

number of individuals that have petitioned because they have a non-presumptive cancer that ultimately will not be compensated under the SEC, but they'll petition basically to add that cancer, which you cannot do.

We've also had petitions for sites that are not covered under the program. And we had five petitions that were actually received prior to the rule being promulgated. And then the other nine reasons are just various reasons. I didn't want to list them all, but you can see the main number is 67 from lack of qualifying basis. And that's about 25 percent of the total number of petitions received, a little bit more than 25 percent.

If a petition qualifies for evaluation, as you know NIOSH reviews the petition as submitted and evaluates it according to the SEC rule. We send notices to the petitioner, the Advisory Board, and congressional staff. We don't always send it to congressional staff now. We did early on when the congressional staff were very active. We still send it to New Mexico staffers because they're very active.

And, again, if we do have congressional staff with any inquiries or anything like that or if it's recommended that we send, do send those as well. We also -- notices are published in the Federal Register and published on the NIOSH website.

Okay. If a petition is not qualified for evaluation, the proposed decision not to qualify becomes the final decision in 31 calendar days. The petitioner can provide new information when it's in this 30-day period for consideration or a petitioner can request an administrative review of the proposed findings. A written review request to the NIOSH Director must be submitted within 30 calendar days -- boy, this is making it challenging -- of the notification that the

petition did not qualify. A petitioner can also file a new petition for the same class thereafter with new information.

We have had petitions that have gone through the complete evaluation process, completed their evaluation for a given time period. We've recommended a class for a certain time period, denied a class for another time period, and then got new petitions because there's been new information that was not previously evaluated, and that new information moved the petition forward, qualified it and moved it forward.

So the NIOSH administrative review. The NIOSH Director appoints -- it says three HHS personnel -- three NIOSH personnel for the -- this is the qualification administrative review. The NIOSH Director appoints these three personnel who are not involved in developing the proposed finding. They have never been employed at a DOE site in question or by DOE Headquarters, and have never been employed at DCAS.

The Administrative Review Panel reviews the administrative record and the petitioner's request and has 30 work days to complete its review. The NIOSH Director then communicates its final decision to the petitioner.

NIOSH has found one of the hardest things to communicate to petitioners is why their petition does not qualify. And that's for many reasons, but one -- explaining a technical reason in terms that anyone -- that everyone can understand is not always easy. If they've identified an incident that -- or an accident that they feel does have the potential for high-radiation exposure however we've reviewed additional information and determine that there is no high-radiation exposure or that the accident may

have occurred but it was monitored, then all of those things we have to communicate to the petitioner, and it can be very difficult. The difficulty in communicating these findings have been recognized in communications with petitioners, Advisory Board Work Group, and administrative review panels.

Early on in the process we identified that we've got to have some interactions with these petitioners, and so we established an SEC petition counselor. You may remember Laurie Ishak Breyer was the first one, and then Josh Kinman, who's doing that now, to communicate with the petitioners.

We also -- NIOSH added an ombudsman to support petitioners and claimants involved in the dose reconstruction and the SEC process and early on based on communications from -- we increased communications between petitioner, SEC petition counselor, and NIOSH lead HP during the qualification process.

Also in process improvements the Advisory Board established a Work Group to review petitions that did not qualify. That was chaired by Dr. Lockey and included Dr. Melius, Dr. Roessler, Brad Clawson, and Wanda Munn. The charge of this Work Group was to review disqualified Special Exposure Cohort petitions and the process followed by NIOSH and the rationale for petition disqualification.

They completed their task on May 2nd of 2007, and their conclusion was that the final rule as reflected in the legislation was followed and NIOSH review of the petition was claimant-friendly. The Work Group provided several recommendations regarding making the process of submitting a Special Exposure Cohort petition more user-friendly. The key part of the recommendation focused on the

communication with the petitioner.

Administrative review findings and recommendations that supported process improvements. The admin review panels reviewed 27 petitions as requested. The panel has agreed with NIOSH's proposed decision not to qualify on 23 of the 27. The four where they did not agree and recommended qualifying the petition were due to a lack of clear communication to the petitioner explaining the reason for the disqualification.

Based on the admin review panel findings and recommendations we have tried to provide more information or proposed finding letters to make it easier for the petitioner to understand our decision not to qualify a petition. And I'll talk about that a little bit more.

Okay. Changes we're making based on recent petitioner concerns and admin review panel findings. I went back after -- this was brought up at the last Board meeting. I reviewed the -- some of the, you know, our initial communications. I also looked back at the Work Group findings that came out of Dr. Lockey's Work Group. And then I also -- we just kind of coincidentally had some discussions from the admin review panel that provided some communications discussions. And it's pretty clear that the biggest problem, as I mentioned earlier, was communicating our findings in an understanding way to the petitioners.

So what we've done is we've added non-technical reviewers to review the proposed finding notification to the petitioner, meaning that I wanted people that were non-HPs to look at this and say okay, can you make -- can you understand what we're saying here, because after the last Board public comment session previously it was clear that we were having

issues with that still. And then we provided additional opportunities -- in the future we're going to provide additional opportunities to petitioner to receive verbal explanation on the proposed findings.

I think one of the things that we've kind of got away from that we're going to get back to is more interaction with our health physicist, SEC petition counselor, and the petitioner, more verbal interaction to help alleviate this issue. And as I'd mentioned previously, we're including a more robust explanation on the proposed finding and the notification letter to the petitioner.

And that's all I've got. Questions?

Member Clawson: Hey, LaVon, you were --

Mr. Rutherford: Yes.

Member Clawson: -- and I understand this is a difficult thing. This is Brad Clawson again.

Mr. Rutherford: Yeah.

Member Clawson: When you say lack of data, I got a question for you. So you've got an SEC petition that ranges for 25 years, and they say that you have insufficient data -- who's typing?

Anyway --

Mr. Rutherford: I know I dealt with that the whole time.

(Simultaneous speaking.)

Member Clawson: Anyway, somebody's got to mute something there.

Anyway, my question is is lack of data, because let's just take for instance, and I'm just going to throw

one out there, americium. Okay. They say that they were not monitored for americium, and you go into that, and this covers 25 years, and you only have three years' worth of data. How do you --

Mr. Rutherford: Well, that was --

(Simultaneous speaking.)

Mr. Rutherford: Yes, and that's -- no, I mean, that -- to me that's a good one because if I look at it -- first of all, if I got a petition, they're petitioning for a 25-year period, and they say americium is my -- that I had a lack of exposure for americium, and I got three years of data, okay, then -- again this is -- remember, Brad, this is qualification. This is not the evaluation. I mean, almost --

Member Clawson: Right, right.

Mr. Rutherford: -- automatically I would suspect that I -- if I determined that they were truly dealing with americium for 25 years, and I only have three years' worth of data, that petition will move forward most likely to -- into evaluation because I have a lack of monitoring data for 22 of those 25 years. But, again, I mean, that --

Member Clawson: Okay. I --

Mr. Rutherford: Go ahead.

Member Clawson: Well, I was just -- I was trying to understand that because we see this so many times in these petitions that come in and stuff. We've got a large period of time, and it's speckled, that we sometimes --

Mr. Rutherford: Yeah.

Member Clawson: -- have a --

(Simultaneous speaking.)

Mr. Rutherford: Remember though -- yeah, Brad, remember though when you're seeing them, those are petitions that have qualified and have moved forward for evaluation. And so that example you gave me was a perfect reason to move it forward for evaluation and get it in front of the Board.

Member Clawson: Okay. That's what I was wondering.

The other thing, too, is, LaVon, if you remember right, Dr. Lockey and I's Work Group on that, that was to get kind of a backlog of SECs that have not qualified that were sitting out there and people had questions of. I don't think that we've looked at any of these later on, and we've brought this up before this. Do we need to take and go through and review these again or what? And if -- because I haven't looked at anything --

Mr. Rutherford: Well, I --

(Simultaneous speaking.)

Mr. Rutherford: Yes. I will tell you that if you look at the numbers of petitions that have not qualified prior to that Work Group meeting -- prior to that Work Group, it was roughly 25 percent of the petitions with a -- that -- as I mentioned earlier, 25 percent, roughly 25 percent of petitions that did not provide a good supporting basis didn't qualify. That number didn't change before you guys looked at it and after you guys looked at it.

So I think the biggest difference that you'll see now is the amount of documentation and detail that goes through in the review, but I just wanted to point that out.

Member Clawson: Well, and I understand that, and I'm not saying anything wrong about it, but I've heard it brought up several times in meetings where the people have said -- and we have a Work Group that looks at the ones that do not qualify, and we haven't looked at anything since that original time.

That Work Group went through all of those that did not qualify, and then we hadn't met again. I'm just wondering if once every two or three years like that just to -- if we ought to be looking at those.

Member Lockey: Brad? I mean, LaVon? LaVon, Jim Lockey.

Mr. Rutherford: Yes.

Member Lockey: Can I ask who's on the NIOSH administrative review panel? Who are those people? I don't need their names.

Mr. Rutherford: Well --

Member Lockey: I mean, what's the background?

Mr. Rutherford: Well, they are scientists and such. They're technical background people.

Member Lockey: Health physics background people?

Mr. Rutherford: You know, I did not review their qualifications because I'm not allowed to be part of that process, but I believe that -- I just know that they're technical people. I don't know that detail.

Member Lockey: But they are technical? They're not laypeople?

Mr. Rutherford: Correct. Yes, they are technical people. And Jenny can correct me if I'm wrong, but Jenny is -- they are briefed on the process, they're briefed on the qualification process, they're briefed

on what's expected and so on.

And, Jenny, if you want to add anything to that?

Ms. Naylor: Sure. Happy to. So the SEC regulation specified that the Director of NIOSH could appoint three HHS personnel. And so that's not limited to just NIOSH personnel. It can include any scientist that has health physics or radiation or occupational health and safety background under the entire HHS universe. And in the past the HHS panel reviewers have been fairly high-ranking scientists within this research agency.

Member Kotelchuck: It's Dave Kotelchuck. But it is entirely within the purview of the Secretary to decide who is qualified. And I --

Ms. Naylor: No --

(Simultaneous speaking.)

Member Kotelchuck: -- suppose we could inform our superiors that -- in the administration that, oh, well, I wish you would do this or that, but that person has the authority and -- but it's good to hear that they're well-qualified people. I'm not surprised.

Member Lockey: One of -- Jim Lockey. One of the things I was thinking as to Brad's comment was that maybe at some point if it's possible, LaVon, to have one of those three people just run through their process with us on the Board so we feel comfortable with what's happening. Is that something that's doable or not?

Mr. Rutherford: I'm going to defer to Jenny.

Ms. Naylor: Sure. The administrative review process really is trying to create a secondary review to make sure that there's accountability over this

qualification process. And so we have done our part in building a firewall between the NIOSH review of the qualifications, the Advisory Board's deliberation process, and also the administrative review process. And there are actually two administrative processes that are specified in the SEC regulation. One is at the junctions of the qualification stage, and the other one is when the Secretary has final decisions about SEC petitions.

So I could send your request, and I assume it would be a request from the Board to have one of those scientists to come and speak about their process, but I'm trying to get a sense of what the Board -- what does the Board hope to come out of this? I think -- hearing you say the comfort level was one of them, but I'm trying to also -- is it something that I can do for you, basically?

Member Lockey: Well -- Jim Lockey. What I was thinking was that if Brad, say, is -- wants the -- our committee to meet every two or three years to review the process, then we have two sets of people doing that. And that -- I'd rather just know what's being done currently. And if it appears that it makes me very comfortable, I'm fine with that. I'd like to drop it --

Ms. Naylor: Okay.

Member Lockey: -- and move ahead through those -- that's what I'm thinking.

Ms. Naylor: Sure.

Member Clawson: Well, and, Jenny, this --

(Simultaneous speaking.)

Member Clawson: Jenny, this is Brad. The other thing that I would like to do as a Board Member is

I'd like to better understand -- because what LaVon is doing -- I have the utmost respect for LaVon and everything else. I'm not questioning anything about that, but it -- so that as a Board Member I understand why these are not getting qualified a little bit better, because some of them are very complex and it -- we've dealt with several of these over the years that when we really got to the root of it like that, was quite complex and we -- it helped me be a better Board Member by understanding of why it did not qualify and things in the future that we need to be able to look for.

Ms. Naylor: Okay. So there are a couple of issues here. One is that I'm happy to relay -- assuming this is the Board's request, to have one of those scientists who has served on the panel to come in and talk to the Board about their deliberation process. And just keep in mind that these don't always have the same panel members. There is a group of scientists who take this on as an additional duty, and it all depends on their availability. So this is point number one.

And number two, Brad, again I just want to make the point that the complex issues that you're seeing are those petitions that have already been qualified. And there's reason why that NIOSH are qualifying these petitions, because they're complex. And so -- and these are petitions that do not qualify for evaluation, what we're talking about today. So just want to keep those apart, right?

(Simultaneous speaking.)

Member Clawson: I understand that 100 percent, Jenny, and that isn't what I said. I said the ones that do not qualify. I have been through this review before. And I understand what Jim wants because he wants -- I just feel, as a Board Member and as

an individual on this Work Group, I just -- I think it would be good for us as this Work Group to get together every once in a while and just run through some of those real quick with LaVon and get to the fine detail of it of why -- where it didn't qualify and everything else.

When we went through all of those cases and stuff, we went through them in like about a day-and-a-half because a lot of it was just really up front and it was simple, but some of them got very complex. That's all I'm looking for. I'm not looking to talk with the Board beyond this or anything else like that, but I can understand why Lockey would want to.

I just want to -- I'm just throwing out to Lockey and to LaVon that maybe once a year or something like that we could just run over the ones that didn't qualify and why they didn't qualify just so that the petitioners are seeing that the Board is reviewing this and is looking into why they didn't qualify and be able to give maybe some suggestions or to be able to help them qualify better. That's all I'm wanting.

Ms. Naylor: Okay. You want --

(Simultaneous speaking.)

Dr. Roberts: Hey, Jenny, this is -- if I could cut -- I'm sorry. If I can cut in at this point, I think what we're going to need to do is if we want to continue to discuss this, to come back if we have time at the end. I believe that we need to move into the Savannah River Site SEC Petition 103 agenda item.

Member Beach: Yes, can I just ask --

Dr. Roberts: So --

Member Beach: Rashaun, this is Josie. Can I just ask a really quick question?

Dr. Roberts: I'm just trying to be mindful of the petitioners who are on the phone. If it's very quick, go ahead, but I'm --

Member Beach: It is --

Dr. Roberts: -- going to need to cut in if it isn't.

Member Beach: And it's something I don't need an answer to now, but if Jenny could tell us if there is a charter document or statement that this group -- the scientists follow, that may be something we can review, or the Work Group can reestablish and review rather than having someone come and talk to the Board.

So anyway, we can pick this back up. Thank you.

Dr. Roberts: Okay. Thank you, Josie.

So as I mentioned, we are at the next agenda item. It's the Savannah River Site SEC Petition 103. And you will note that pretty much the remainder of today's session is devoted to that particular agenda item with a small break built in at roughly 3:15 p.m., resuming the session at 3:30 p.m.

The agenda allows for presentations from the SRS Work Group, NIOSH, SC&A, and Petitioners will be welcome to present as well.

Mr. Brad Clawson is the chair of the SRS Work Group, and I will now hand it over to him to open it up.

Brad?

Member Clawson: Okay. Thank you. Now let me ask you a question. Is everybody else's screen black,

because mine is?

Member Roessler: I can see your --

Member Clawson: I have -- you can see my slides?

Member Roessler: I can see them.

Member Ziemer: This is Paul. I can see your slides, Brad.

(Simultaneous speaking.)

Member Clawson: Okay. Because my computer just went dead. So I'm going to read it.

Bob, could I get you to do the slides for me?

Mr. Barton: Yeah, no problem, Brad.

Member Clawson: Okay. We'll start out with the first slide. Advisory Board on Radiation and Worker Health, Savannah River (SRS) Work Group recommendation for SEC Class consideration. Those on the SRS Work Group are James Lockey, Dave Richardson, and Phil Schofield, and myself, Brad Clawson, as the Work Group Chair.

Next. SRS site. SRS began operations in 1952, devoted to material production for nuclear weapons program. SRS processes included nuclear fuel fabrication, reactor operations, radiochemical processing, uranium recycling, plutonium and tritium production, neutron source production, and waste management.

Facilities. Thirty-plus, included production reactors, F and H processing canyons, Solid Waste Disposal Facility, F/H Area Tank Farms, Plutonium Form Facility and Plutonium Experimental Facility, receiving Basin for Offsite Fuel Facility, Uranium Target Fabrication Facility, Fuel Fabrication Facility,

scrap recovery facility, and 773-A analytic laboratory.

Key radionuclides at Savannah River: plutonium, americium, uranium, neptunium, thorium, tritium, fission products.

RPRT-0092 analysis period was from 1972 through 1998. Two operating contractors were there: DuPont from 1972 to 1989 and Westinghouse, 1989 to 1998.

Next. SEC history for SRS. Petition 00101, qualified March 2008. NIOSH Evaluation Report, November 14th, 2008; January 1st, 1950, through December 31st, 2007. Addendum 1, May 4th, 2010; January 1st, 1953, through December 31st, 1965. Addendum 2, January 1953 through December 31st, 1972.

The Advisory Board, on December 29th, 2011, recommended SEC Class for January 1st, 1953 through September 30th, 1972, for all employees at SRS, due to lack of sufficient information necessary to complete individual dose reconstructions with sufficient accuracies for internal radionuclides exposure due to thorium in some areas of the facility during the time period in question.

Addendum 3, November 20th, 2012; October 1st, 1972, through December 31st, 2007. Under review by the Work Group with focus on current reviews on subcontractors and job-specific bioassay data completeness and representativeness for 1972 to 1998.

Next. Subcontractors at SRS. Supplemented in-house construction trades workers performing same work: electrical, carpentry, labors, sheet metal workers, welders, and so on. Relatively few in the 1970s, but grew rapidly in the 1980s to the early

'90s, as SRS mission expanded to include major waste management, environmental upgrades, D&D, and the reactor restart operations. Usually temporary and intermittent hires, subcontractor construction trade workers. Moved throughout SRS facilities. May have been assigned higher exposure radiological jobs, based on interviews with former workers, which were often performed under work permits.

Next slide. SEC Issue: subcontractor bioassay data completeness. In 2014, SC&A reported to the Advisory Board that the SRS subcontractor records had not been verified and validated, V&V, for completeness. NIOSH considered options for substantiating bioassay data completeness, including use of CPWR and NOCTS data.

In 2017, NIOSH performed a subcontractor construction trade worker bioassay data completeness review, based on job plans for Building 773-A for 1981 through 1986. This is RPRT-0083. The Advisory Board tasked SC&A to perform similar sitewide reviews for 1972 through 1998. SC&A found completeness, based on indicators of subcontractor job-specific bioassays in the range of 66 to 84 percent, depending on assumptions made. NIOSH determined a higher rate. More notable were contractor self-surveys showing only 21 percent completeness for job-specific bioassays in 1997, leading to DOE enforcement action at that time.

Work Group evaluation. NIOSH expanded scope of SRS subcontractor construction trade workers review with additional permit records from the Atlanta Federal Records Center. Evaluation issued in June 2019 as RPRT-0092, concluding that, for 1972 to 1998, a large percentage of the subcontractor construction trades were monitored for potential intakes while working under a job plan, safe work

permit, or a radiological work permit.

SC&A noted that a large percentage, 89 percent, is over all years, all permits, one radionuclide, but found conclusions based on a faulty premise and assumptions regarding what, when, and how bioassays matched.

In the context of permit-related, job-specific bioassays for at least 1972 through 1990, SC&A found: inability to link job-specific bioassays to permits; uncertain target radionuclides; lack of reliable sitewide facility characterization; only one SRS facility, 773-A, surveyed, with none from 1975 to 1979; low completeness rates found for americium in 1981 through 1987 (e.g., 20 percent actually monitored; 33 percent total could be considered represented in a co-exposure model). The RPRT-0092 survey results for americium are only for 1973 and 1981 through 1987.

Work Group discussion in the meetings of December 6th, 2019, and November 17th, 2020. Did RPRT-0092 accomplish its objective of demonstrating that the monitored subcontractor construction worker trades and unmonitored subcontractor construction worker trades worked side by side in the same radiological environment at the same time? Can completeness of job-specific bioassays for subcontractor construction trade workers be demonstrated? Not for at least 1972 to 1990.

Does the limited scope of review for 1972 through 1990 (just 773-A) impair a sitewide conclusion regarding subcontractor construction trade worker job-specific bioassay completeness for those years? Yes.

Does limited subcontractor construction trade worker bioassay data for americium (only for 1973

and 1981 through 1987), with 20 percent monitored and 33 percent represented in co-exposure model, satisfy IG-006 criteria? No, it does not.

Are there alternative methods of demonstrating completeness available? Or applying a co-exposure model for unmonitored subcontractor construction trade workers based on routine, incident, or NOCTS data? None that satisfy IG-006 co-exposure guidelines concerning representation.

Work Group conclusion. For 1972 through 1990, RPRT-0092 falls short of demonstrating subcontractor construction trade worker job-specific bioassay data completeness due to the lack of permit records to support evaluation and inability to relate bioassays to specific permits in the DuPont era.

For 1991 through 1998, subcontractor construction trade worker job-specific bioassay data completeness may be established, but with some qualifications that remain to be addressed regarding effectiveness of RWP bioassay compliance.

Alternative methods, including relying on routine monitoring and NOCTS data, are not sufficient to establish completeness and representativeness of subcontractor construction trade worker data, as required by IG-006 co-exposure model guidelines.

Work Group recommendation to the Board: that the Advisory Board consider an SEC Class for subcontractor employees at SRS from October 1st, 1972, to December 31st, 1990.

Basis includes:

Unmonitored subcontractor construction trade workers who should have been monitored under work permits and job plans for job-specific

bioassays, but were not.

Potential for elevated exposures over various site locations at intermittent times; subcontractor construction trade workers were often transient, performed high-exposure potential jobs under job plans and permits, and did not consistently provide termination bioassays.

Severely constrained scope of data: only 773-A facility. Limited data analysis demonstrates real issues for americium-241 across all years. Uncertain completeness for other radionuclides (plutonium and fission products): subcontractor construction trade worker job-specific bioassay evaluation in RPRT-0092 performed only for 773-A, none for 1975 through 1979.

This is the recommendation that has come from the SRS Work Group to the Board that we wanted you to take under consideration. We still have NIOSH's and SC&A's presentation, but if there are any questions at this time, we're more than willing to listen to them.

Member Field: Thanks for the presentation. This is Bill Field. I was just wondering, was the Work Group's recommendation unanimous?

Member Clawson: Yes.

Member Field: For the record. Okay. Thanks.

Member Clawson: Anything else?

Dr. Roberts: Also, sorry, Brad, but I can still hear someone typing. If people could take a moment to mute phones, that would be very helpful.

Member Beach: Rashaun, I wonder if someone needs to mute their computer, as well; they think

their phone's muted and maybe they have their volume on on the computer. This has been going on the whole meeting.

Dr. Roberts: Yes. So, take care to mute your computer as well.

Member Clawson: Rashaun, without any questions, I think that I would move on to SC&A's report. And I'll try to get my computer back working at this time. I apologize for this. It's just my luck.

Dr. Roberts: Okay. All right. So, yeah, let's go ahead. I believe, Joe, you're presenting on behalf of SC&A?

Mr. Fitzgerald: Yes, I certainly can. I wasn't sure what the order would be, so I will switch this to being next. And I would assume NIOSH will close out, then.

Dr. Roberts: Yes. My understanding was that NIOSH was coming next, but it sounds like Brad --

Mr. Fitzgerald: Well, that was my understanding, too, so that's why I'm a little confused.

Dr. Roberts: Okay. Well, maybe we should just go with the order of the agenda. Is NIOSH ready? Tim, are you ready to present?

Dr. Taulbee: I certainly can. I was ready to go either next or last. It didn't matter to me.

Dr. Roberts: Okay. Why don't you go ahead?

Dr. Taulbee: All right. Give me just a second here to pull up the presentation.

(Pause.)

Member Clawson: I'm sorry; I went to unmute my

phone and hung up the phone. If NIOSH is going next, I'm sorry, Tim, go ahead. I didn't know what was going on with that.

Dr. Taulbee: Okay. I was open, like I said, to going either next or last. It didn't matter to me.

Member Clawson: That's fine. Go ahead and go next, Tim. That's fine. This whole computer thing kind of got me a little bit frazzled.

Dr. Taulbee: I understand. I certainly understand.

Okay. Well, thank you, Mr. Clawson. Our presentation is going to be on dose reconstruction feasibility for subcontractor construction trades workers at the Savannah River Site. I'm going to be giving the presentation. John Cardarelli is coming up to speed and will be taking over for Savannah River Site from me.

But, really, I wanted to thank the ORAU Team for all of the work they've been doing, and, specifically, Mike Mahathy, Nancy Chalmers, Roger Halsey, Matt Arno, Liz Brackett, and Don Morris. They've been working on this subcontractor construction trades worker monitoring issue now for about three years, and I'm going to be trying to summarize their work in less than an hour here. So, bear with me, and I hope I do their work justice here.

As an overview here, I'm going to start with some background, go over the Savannah River co-exposure model, the Co-exposure Implementation Guide as it applies to completeness, briefly, very briefly, on radiological monitoring at SRS. And I'm going to focus the presentation on the three subcontractor evaluations that we've conducted. Okay. The first one is RPRT-92, and the second one is RPRT-94, which looks at just the NOCTS data. And then the final one is the plutonium bioassay

logbooks, and wrap up with a summary and conclusion.

So, let's start with the SRS co-exposure models, okay? NIOSH develops co-exposure models because we recognize that some workers were not monitored that, in retrospect, perhaps should have been monitored. For a co-exposure model to be valid, a bounding or representative sample of the workers is needed. If all the exposed workers were monitored 100 percent for every radionuclide, there wouldn't be a need for a co-exposure model. This is why we have it. We know or we believe that there should have been more people monitored than were. So we're really looking for a bounding and representative sample here.

The internal dose models in the Savannah River co-exposure model -- this is ORAU-OTIB-81 -- form the basis of why we believe dose reconstruction is feasible for unmonitored workers at the Savannah River Site. The internal dose co-exposure models were stratified a priori by operations workers, non-construction trades workers, and construction trades workers. This resulted in two separate co-exposure models for each radionuclide. And the radionuclides that we developed models for were americium, tritium, plutonium, uranium, fission products, cobalt-60, cesium-137, neptunium, and thorium.

The construction trades workers strata was set up -- it combines two groups of construction trades workers. One of them is the DuPont construction trades workers, and these are select Role 2 workers. Role 2 workers means they were assigned to operations, but they were construction trades crafts; electronics and instrumentation technicians, these were electricians; building maintenance, these would be more like millwrights. And then there

would be other carpentry and so forth assigned. But these workers were assigned organizationally to operations and they did a lot of the kind of lower-level maintenance and so forth within the facilities.

All other construction trades workers, Role 4, 5, and 6. So it was the combination of these that we put into our initial strata.

Okay. The definition that we used in these evaluations is by payroll ID, not by employer, from this 1972 to 1989 time period. In this time period, the subcontractors in Role 4, 5, and 6 include the electricians. The subcontract was Miller-Dunn. The pipefitters were under a subcontract to B.F. Shaw. The insulators were under a contract to North Brothers.

Other groups, such as the boilermakers, were hired directly out of union halls by DuPont, okay, so there wasn't a set subcontract for them. But they would be hired by DuPont. They would work for a few months, maybe a year or two, and then be terminated, and then we would see them coming back after a period of another few years, or so forth. We treated those as subcontractors because they were added as Roles 4, 5, and 6. Okay. So, it's not by employer; it's more by payroll.

Dr. Roberts: Okay. Sorry, Tim. We clearly have someone off mute again. Zaida or Nancy, is there any way to --

Ms. Burgos: Yes, I'm going to call the information to cut it off.

Dr. Roberts: Okay. Thank you. Sorry, Tim.

Dr. Taulbee: No, that's all right.

Member Lockey: Rashaun, this is Jim. For some

reason I got the presentation last time, but I'm not seeing it on my screen this time. So, I tried to re-enter three times. It hasn't helped.

Dr. Roberts: Are you able to just bring it up --

Member Ziemer: This is Paul. I'm seeing it just fine. I'm seeing it just fine.

Member Beach: Yeah, this is Josie. I have it also.

Member Clawson: It's just you, Jim.

Dr. Roberts: Do you think you can pull it up, Jim, and follow along, you know, opening it up as an independent file?

Dr. Taulbee: Dr. Lockey, if you can do that, I will tell you when I'm advancing slides so that you could better keep up, if you can open it independently. Is that possible?

Dr. Roberts: Jim, are you there?

Member Lockey: Yes, I'm here. I'll find it. Go ahead.

Dr. Roberts: Okay.

Dr. Taulbee: Okay. I'm on the "Co-exposure Implementation Guide" title slide. And I believe this is slide 8 of 71. Okay? All right.

Member Lockey: Thank you.

Dr. Taulbee: Slide 9. So, the issue, as Mr. Clawson had pointed out, is the completeness of the subcontractor data for co-exposure. And this is a slide I presented during the December 2017 Advisory Board meeting, where SC&A concluded that bioassay data for subcontractors, for construction trades workers subcontractors specifically, and CTWs generally, is demonstrably

incomplete from 1989 to 1998, and likely before that time period, and does not satisfy the criteria set forth in the NIOSH Draft Criteria for the Evaluation and Use of Coworker Datasets. And I added emphasis here. Okay?

Now, we respectfully disagreed at that time, and we still do. We believe that 90 to 87 percent direct monitoring of subcontractors is not demonstrably incomplete. The NOCTS data indicated the subcontractors were monitored and indicated 91 percent of the subcontractors who were claimants between '91 and '97 have some form of internal monitoring. What we've done over the past three years is we've expanded this evaluation beyond the 1989 to 1998. We've added an RWP evaluation. And so we've expanded this.

Okay. Next slide, slide 10. So, the issue here is completeness. And since that time, last year, in fact -- or earlier this year was when it officially became approved -- is the Co-exposure Implementation Guide. And Section 2.2 covers data completeness.

And this is what it says: "Once the measurement techniques have been found to be technically acceptable, the amount of available monitoring data must be evaluated to determine if there are sufficient measurements to ensure that the data are either bounding or representative of the exposure potential for each job exposure category at the facility. This analysis should look not only at the amount of data that is available, but also consider any temporal trends in the data availability."

Next slide, slide 11. It goes on to say, "If the number of potentially exposed workers in each category is unknown, a useful starting point is to look at the distribution of samples among the various categories of workers represented in the

claimant population at that site. Table 1 provides an example of this for the categories of workers who were monitored for plutonium at the Nevada Test Site."

And so I've reproduced here Table 1 -- this is slide 12 -- out of the Co-exposure Implementation Guide. And what you see here is that they indicated that there was 290 plutonium samples over the time period of 1963 through 1992. 206 of them were from the rad safety group; very few from the laborers, the welders, the wiremen, the miners. Security had a significant fraction of 74, but they were only in the latter time period.

What I hope you'll see after my presentation today is that Savannah River looks nothing like this, okay, that we've got data that demonstrates that all of the different job categories are covered, and then we've got data that is indicating the workers were monitored in the other time periods.

And my slide just advanced on me automatically. Okay. All right.

So, now, before I move on into those three evaluations, I want to briefly touch on the radiological monitoring at SRS, because this is critical, okay? SRS used a defense-in-depth approach to radiation monitoring with the intention to prevent non-tritium intakes. They had a zero intake policy. They had engineered controls. These will be glove boxes, fume hoods, and cabinets, which is a much larger glove box, effectively. Those were the engineered controls. They had procedural controls of how much material you could work in fume hoods versus glove boxes. And when they broke into those particular engineered controls to do maintenance or to do something, they wore personal protective equipment. Okay?

There was surveillance to verify that these engineering, procedural, and personal protective equipment controls were effective. There was air monitoring. There was facility contamination surveys. There was personal contamination surveys. And there was routine and job-specific bioassays. Okay?

Moving on to slide 15. There's no practical difference between routine and job-specific bioassay. Both were used to verify the effectiveness of the procedural and engineering controls. Okay? When one of these bioassays came up positive, that was a trigger for a special bioassay; for-cause, effectively. And so that was when they would do follow-up. They would do more characterization to find out what the workers were exposed to.

These bioassays were requested from workers who had a reasonable potential for intakes, but who SRS was pretty confident that the intakes did not have intakes in excess of 2 percent of the annual limit.

Westinghouse -- and this is in the 1990s -- further stated the workers themselves were the last line of defense in the workplace indicator program, which was the reason why a confirmatory program for workers was conducted.

Now, routine versus job-specific bioassay. Most workers, 95 percent, were on routine bioassay. This includes both subcontractors and operations workers. SC&A postulated that subcontractors were primarily on job-specific bioassay. And this is a quote from the November 2017 Work Group meeting: the question of how "complete is complete enough for coworker development can only be answered in the context of coworker guidelines and stratification assumptions that have been validated -- they guide what datasets can be legitimately

applied. However, 79 percent incompleteness strains credulity."

SC&A is implying here that only 21 percent of the subcontractors were monitored. We will show in this presentation that the subcontractor monitoring was much greater than 21 percent.

Where did that 21 percent come from? And I showed this slide previously, in December 2017, at the Advisory Board meeting. And I'll walk through the limited assessment here, the 3200 bioassay requirements that were evaluated where they found the 33 percent compliance with job-specific bioassay.

And so the red numbers is what I'm going to go through here. The worker signs in on an RWP requiring bioassay. The worker participates in a routine bioassay sampling program for the radionuclide specified on the RWP. Ninety-five percent of them --

Dr. Roberts: Sorry.

Dr. Taulbee: Go ahead.

Dr. Roberts: Okay. I was hearing something in the background. I don't know if you could hear it, but it was disruptive. It sounds like someone muted. Thank you.

Dr. Taulbee: Okay. So, 95 percent of the workers participated in the routine sampling. Five percent participated in the job-specific bioassay. And you see here, no, they did not participate in routine. It was required on the RWP. And so it goes over here to the job-specific bioassay. Sample was required.

When you follow down through to the red, 67 percent noncompliance here resulted in 107

samples out of 3,092 samples. Okay? So, from a co-exposure modeling standpoint, we don't feel that these job-specific bioassays are that critical to the overall co-exposure model.

Now, SC&A pointed out that's a limited assessment. The full assessment found that that compliance rate dropped to 21 percent, and that's where I got the numbers here in blue. Okay? This is the 33 percent there in the center. I don't know if you can see my pointer or not. But that's where the 21 percent comes from.

We know from that evaluation, that full assessment, that a total of 256 samples were not received under the job-specific bioassay. When you back through the calculations, going backwards, that results in that there would be 324 job-specific bioassays. And that would be 324 out of 6,481 total bioassays. So, again, the job-specific is a very small component of this program at this time, and most of the workers are under the routine monitoring program.

Savannah River did a hundred percent follow-up with those 265. In other words, they didn't get those samples initially, they went back and requested samples from all 256, and no worker had any intake during that time period. Okay.

So, are subcontractor construction trades workers bounded or sufficiently represented in the co-exposure model? SC&A is saying, no, they are not. The basis for saying subcontractors are not bounded or sufficiently represented is not clear to us at NIOSH. Okay? I can kind of see it, maybe, with just looking at RPRT-92, but there's more information out there and more that we have developed, more information that we feel is important here.

We feel that the subcontractors are bounded and

sufficiently represented based on the analysis of the work permits and bioassays, the quantity of monitoring data available in NOCTS, and a review of the plutonium bioassay logbooks.

Okay. Now I'm going on to, this will be slide 20. And I'm going to start talking about those three evaluations. And this one is RPRT-92, the Evaluation of Bioassay Data for Subcontractor Construction Trades Workers at SRS. The goal of this report was to determine the percentage of subcontractor construction trades workers monitored by year -- that temporal effect that I showed you earlier in the Implementation Guide -- to determine whether unmonitored subcontractor construction trades workers were represented by a monitored subcontractor in the same radiological environment at the same time, and determine whether the subcontractor CTWs were monitored for the radionuclides of concern, given the radiological environment on the RWP.

So, to do this, we developed an RWP sampling plan. We randomly selected subcontractor radiation workers from various areas at the Savannah River Site so that an evaluation of monitored and unmonitored workers could be conducted. The first step was to define the sampling frame. We focused on actinide exposures: plutonium, uranium, americium, and neptunium. We excluded standing radiation work permits. These are more routine work, and subcontractors likely would not be a large number of the workers identified on those standing radiation work permits. They are identified sometimes, but, usually, it's the non-standing radiation work permits.

We specifically excluded Reactor Areas C, K, L, P, and R from our sampling. Okay? And the reason that we did this was primarily due to low-dose

tritium. Previous discussions with the Work Group and the Board where we looked at subcontractors versus the subcontractor CTWs, versus DuPont CTWs, we found that, since 1973, 95 percent of the subcontractor tritium doses have been less than the 95th percentile -- sorry -- have been less than 100 millirem, with a downward trend. Since 1980, the DuPont CTWs' 95th percentile tritium dose has been less than 100 millirem, again, with a downward trend.

Our conclusion was tritium monitoring for subcontractors is not a dose reconstruction issue. And this is primarily because below 100 millirem, in modern times, that's the threshold for even requiring monitoring. Okay? So, it's a combination of all internal and external, of course, but the tritium, it takes a lot of tritium intake in order to receive a significant dose. So we never even looked at tritium, which is part of why, when we got the initial draft SEC Class proposal a week ago from Tuesday, when all internal radionuclides were included, we were quite surprised, because tritium has not even been really discussed or evaluated within the Work Group. Okay?

Now, for RPRT-92, one of our assumptions was that respirator use is a reasonable conservative surrogate for the need for internal monitoring. However, we recognize that not all respirator use requires bioassay. We had to come up with some way from these RWPs to try and figure out; did this person need internal monitoring, yes or no? And so we said, if they used a respirator or that was indicated on the RWP, then, yes, we would look for internal monitoring.

Please keep in mind that in health physics some use of respirator protection is precautionary, okay, in case something happens or if contamination is

unexpectedly encountered. All right? If there's no contamination, then there's no potential for an intake and bioassay is not necessary. The RWP evaluation that was conducted did not consider this effect. We simply looked at, respirator, do they have bioassay.

And here's an example of respirator use that I presented in August 2017 where bioassay is not needed. And I'll read this particular radiation survey: "Survey for construction pipefitters to complete job started yesterday. Off-gas exhaust line was bagged up and cut into two sections. No problems were encountered during job. Construction and occupational health physics wore two pair of white coveralls, cloth and plastic shoe covers, cloth hoods, rubber gloves, and full-face respirator for the job. No transferrable contamination was detected during the job. Impactor air sample taken during the job calculated less than .2 times 10 to the minus-12 microcuries per cc. Job was completed at this point."

So there's no transferable contamination, and the air concentration was less than .2 times 10 to the minus-12 microcuries per cc. Bioassay really would not be required here. But, in our evaluation, if we've got four construction pipefitters working on this job, we went and looked, do they have bioassay? If two of them did and two of them did not, then that would be 50 percent. Okay?

Now, if you go through the radiation surveys, you're going to find more of these type of evaluations where that air sample is not less than 10 percent. In fact, it could be 2 to 3 DAC. And so there are times when airborne contamination was expected and was found and there was transferrable contamination. Okay? So, you're going to find both of them in there. When we did our evaluation, it was simply

from that RWP, if they wore a respirator, yes or no, did they have a bioassay?

Okay. So, now I'm going to briefly go through the Westinghouse era of 1990 to 1998. And this is where we looked at the plutonium. I'm just going to show the plutonium monitoring here by year for this particular time period. And how do you read this table that I'm showing here? And I'm going to go through the very top line of the year 1991.

And I'm sorry; I've not been keeping up here, Dr. Lockey. It's slide 27.

For 1991, we looked at 17 RWPs. And from those 17 RWPs, there were 82 construction trades workers that will be wearing respirators. We went through and looked at bioassay monitoring, and we found 78 of the 82 had plutonium bioassay. So that's 95 percent with bioassay. There were four workers that did not have bioassay. Okay? Three of them we matched directly onto an RWP with one of these monitored workers. So the effective monitored between subcontractors with monitoring and those we could directly match was 99 percent in this particular case. You can see the range here. It's from 83 percent to 100 percent. Okay? So, this is from plutonium by year, 1991 through 1998.

We also looked at area in this time period, 1990 through 1998. We looked at A, F, H, E, and Z Areas. Okay? F and H are the two primary plutonium areas. That's where plutonium was separated. These are the canyon buildings and the B lines. And also you've got the PUFF facilities, as well as PEF facilities that Mr. Clawson had mentioned in his presentation. So, they're actually in F area here. Okay? Scrap recovery is in H area. Okay? So, these are the main areas, and what we see is consistent monitoring across each of the areas from the

workers' standpoint. The subcontractors were monitored.

We also looked by craft. And here's where, if you think of that chart that I showed earlier with the Nevada Test Site workers where whole crafts were missing, we don't see that here. We see reasonable monitoring across all of the crafts that were evaluated on this RWPs. And here you can see there would be 12 RWPs that identified boilermakers: 27 boilermakers. Twenty-four of the 27 were monitored. Okay?

And so we looked at not just plutonium, but multiple radionuclides: plutonium, strontium, uranium, americium, neptunium. And we see the percent with bioassay. This is where that total 88 percent comes from. When you add all of these up, subcontractors monitored for the bioassay required, you get 88 percent. We could match 114 to these. So we've got like 95 percent here in this time period.

Now let's look at the late DuPont era, 1980 to 1989. And this is where we began to run into some difficulties, because only job plans and special work permits for A Area were available for our evaluation. Job plans were the primary source of the information. Job plans from other areas we believe might have been destroyed, based upon interviews with workers and discussion of records personnel.

But it's important to note that job plans are not considered a permanent record. Okay? So, to use or to base all conclusions upon the availability of job plans is really not reasonable because we are not going to find these type of plans, necessarily, at all the facilities across the complex, because they weren't necessarily permanent records to be retained. The bioassay, the whole-body counting, the dosimetry, those are permanent records that we

use for dose reconstruction.

The other point here is that special work permits were being phased out after 1972, which is part of why we don't have them. They switched to using a checklist type of methodology before they re-instituted the radiation work permits in the 1990s.

During this time period, instead of doing a random sampling, we did a census. And that means that we evaluated all job plans that had subcontractor CTWs. And now, you know, SC&A has indicated we only had one area in this particular evaluation. We evaluated 5,000 job plan pages. That's what we reviewed.

Dr. Roberts: Okay. I'm hearing a lot of background noise. If we can mute phones and computers, if you're on Skype.

Sorry, Tim.

Dr. Taulbee: Okay. So, of the 5,000 job plan pages, 1,200 involved construction trades workers. A thousand of those were DuPont construction trades workers, the Role 2 workers. These would be those electricians under the E&I, electronics and instrumentation, technician; the building maintenance mechanics; the millwrights, so forth. Those were the DuPont construction trades workers.

But we did find 163 pages that involved subcontractor CTWs. So, approximately three percent of the total off-normal work was conducted by subcontractor CTWs. However, 14 percent of the construction work was conducted by these subcontractor construction trades workers. In total, there were 591 subcontractor construction trades worker monitoring evaluations that we conducted in the 1980 to 1989 time period. Okay? This identified 219 unique subcontractors on 145 job plans.

Now, from 1990 to 1998, when we did the random sampling, we sampled 146 radiation work permits and identified 429 unique subcontractors. Okay? So, this is less subcontractors, roughly about the same number of RWPs, but only for one area. But we did the same evaluation. We looked at radionuclides by year and by craft. But, again, this was one area, and we did not have any data from 1989.

Okay. So, here it is the plutonium monitoring data by year. And what you'll see here is that there's about a 10 percent drop in the total monitoring of subcontractors with bioassay. Before, this was 88 percent, and now it's down to about 80 percent. Okay? But the effective monitoring stayed relatively stable. We were pairing more of these unmonitored subcontractors with the monitored subcontractors on a per-year basis.

We looked across crafts again. And again, we're seeing all of the crafts being represented here within the monitoring. And we looked at radionuclides: plutonium, strontium, americium. The results for plutonium and strontium-90 are slightly lower, about 10 percent less than the 1990-to-1998 time period. The percent monitored results for americium are lower at 34 percent.

What it's important to look at here: the subcontractors matched to a coworker with bioassay. Okay? It's much higher from a percentage standpoint, making the effective monitored there around 76 percent. So, while we only have 34 percent with monitoring, we are able to match 63 of these workers who were not monitored to these 52. These would be on the same radiation work permit.

Okay. Now, one of the things that has not been greatly discussed, but I really want to point it out to the Board here, is that the subcontractor evaluation

in this time period, from 1985 to 1989 -- or I'm sorry, 1980 to 1989 was for one area. However, we have additional incident report data from F and H Areas. These would be the two primary plutonium separation areas.

Is this data limited? Yes, but it does represent the upper bound of the exposure potential. Because here is the situation, if you think of that defense-in-depth approach, where something went wrong, okay, where something happened with those controls, either a PPE control or an engineer control or a procedural control. Something went wrong and there was some incident that occurred.

And so our question was, is there evidence the subcontractors were monitored following an incident and upset type of condition? Because if we don't see subcontractors in this group, we've got a problem with the co-exposure model, because that means the people had a potential for an intake where they got contamination on them, where there was an incident recorded, and if they don't have bioassay, that means the high-end data is missing from the co-exposure model. And that is a very serious situation. Okay?

So, we looked at these. This is data that we don't feel should be discarded so easily. And what we found is that a higher percentage of the incident monitoring data in the subcontractors were monitored. Of these incidents, there were 44 plutonium bioassay required, and 41 of the 44 showed plutonium monitoring data, or 93 percent. So there was good follow-up of these subcontractors that were involved in these incidents, these workers with a high exposure potential, because something went wrong and an incident happened. Okay?

The numbers are slightly less for strontium and

fission products, but, again, these are low numbers here -- or a low sample size. Let me put it that way. Okay?

So, based upon this, there's clear indications for not just one area, but three areas of sufficient monitoring of subcontractors, CTWs, during the 1985 to 1989 time period, for plutonium and strontium mixed fission products. The combined evaluation shows no significant difference by year, craft, or area. Again, we're only looking at A, F, and H Areas. But the F and H Areas, we know those are the upper bound here of that potential exposure. So, remember, in co-exposure modeling, it's representative or bounding. Okay? There's less monitoring in the modern era, but, still, a majority of the workers are monitored for plutonium and strontium. But there is a lower percentage for americium, 34 percent, but we are matching more of the unmonitored to those workers. So it's not that those workers were not monitored. And with the americium, the combination of the two represents 77 percent of the population.

Now let's talk about the last era, the mid-DuPont era. Again, only job plans and SWPs from A Area were available. Instead of sampling, we did a census. There's no data that we could find from 1975 to 1979 to conduct the evaluation. There were some job plans available from 1975 to 1979, but none indicated subcontractor construction trades work. Evaluation was limited to 1972 to 1974, three years in this era.

Again, there was approximately three percent of all the work, off-normal work, involved subcontractors, and approximately 14 percent of the construction trades work was conducted by subcontractors. And here you can see that the numbers are dramatically decreased when compared to the 1980s and 1990s.

We're only at 136 subcontractor evaluations could be conducted, 31 unique subcontractors on 59 job plans. And what you can see is they use the same subcontractors on multiple job plans here. The same evaluation method as the previous two intervals. They didn't do it quite by year and craft, but, again, this was limited.

1972 to 1974, what we see is a marked decrease in plutonium by year. In 1972, there's a reasonable percentage, a majority, of 77 percent. In 1973, a rather low percentage of 28 percent. And in 1974, there was only four job plans, involving seven workers -- that we could evaluate.

Okay. Next slide. This will be slide 45. 1972 to 1974, the plutonium monitoring by craft. Again, we don't see any crafts that are really being excluded here. We were limited on the job plans. There's only a few crafts, I guess five here, that were identified on those job plans.

And what we see in the totals, looking at plutonium, strontium, and americium, the results for plutonium and strontium are both lower than in the 1980s and '90s. However, the percentage is really dominated by 1972, so I'm not sure you can draw a big conclusion based upon this. There was only one data point for americium.

Again, this evaluation was limited and dominated by the 1972 data. There was a marked decrease in plutonium monitoring in '73 and '74. Less than a majority of the subcontractor construction trades workers were monitored for plutonium in those two years. Strontium monitoring was better, and there's only one data point for americium.

So, a summary of the RPRT-92 from our standpoint is that, 1990 to 1998, the evaluation across time,

area, and craft indicated subcontractor construction trades workers were monitored 88 percent of the time. And we believe this 88 percent would be sufficiently representative for use in a co-exposure model for the 12 percent that would not be monitored, roughly.

1980 to 1989, evaluation across time and craft in one area indicated that subcontractor construction trades were monitored 74 percent of the time. And we believe that this 74 percent would be sufficiently representative for the 26 percent that would not be monitored, primarily because the evaluation of the incident data in two other areas indicated that the subcontractors with the highest exposure potential are represented in the co-exposure model. That would effectively bias the model slightly high.

1972 to '79, there's limited data to the first three years for one area. It indicates CTWs are represented, and we're not seeing that they're being excluded, but they are certainly depressed from the other two areas.

Now let's look at RPRT-94. The SRS and SEC Issues Work Group discussions since 2017 have focused on the RWP job plan -- that's RPRT-92 -- and the co-exposure models, with a major emphasis on the co-exposure models, to try and obtain Advisory Board approval of that Implementation Guide 6.

Simultaneously, we have done another analysis, and this is the NOCTS data analysis in ORAU RPRT-94. This has not been discussed at the SRS or SEC Issues Work Group meetings. When the proposal for a Class came forward to the Advisory Board, we requested that Work Group Members consider this report before recommending a Class be added to the SEC. And I'd like to reemphasize that. I would encourage all the Board Members to please review

and read RPRT-94.

In this report, NIOSH evaluated subcontractor monitoring using only NOCTS data. And this would be as of August of 2018. When we cut off the analysis, there were 6,097 total SRS claimants; 886 were subcontractor construction trades workers.

Off to the right is the distribution of the pie chart of the subcontractor construction trades workers. It's 26 percent electricians, 22 percent were pipefitters, 9 percent were laborers, 7 percent were carpenters, 6 percent were ironworkers. We're seeing all the construction trades represented here, is my point.

The NIOSH evaluation, we evaluated external monitoring and internal monitoring. Internal monitoring was broken into tritium bioassay, non-tritium bioassay, which is primarily the actinides, and whole-body count. This would be fission products.

I want to focus on the externally monitored subcontractor construction trades workers discussion within this report. And the reason I want to do that is the difference between new construction and the renovation, remodeling, and D&D, because the renovation, remodeling, and D&D activities is where the high risk of exposure is. New construction, there really isn't much -- depending upon where it is, there really isn't much potential for an internal exposure. And so those workers doing new construction in a clean area weren't externally monitored.

But to do the renovation, remodeling, and D&D within a facility, those workers were externally monitored. So the numbers I'm going to be presenting to you here are the externally monitored. But we recognize not all externally monitored work

required internal monitoring. If you think of the RPRT-92 evaluation, I gave the example of respirators, did it require internal monitoring? Most of them likely did, but not necessarily all of them.

We had the same situation here. Not all externally-monitored work requires internal monitoring. One of the facilities Mr. Clawson mentioned was the Receiving Basin for Offsite Fuel. There you would be required to be externally monitored, but there really isn't a potential for internally monitoring, as the source term is spent nuclear fuel that is the spent fuel pool that is under water. And so the potential for exposure is primarily external radiation.

When we did our analysis, though, we only looked at, externally monitored, do they have internal monitoring, period, nothing further. One of the benefits of this analysis is it's not limited to a specific area. It covers all areas and all facilities. It also represents the data used in dose reconstruction. Okay? This is the actual claimant data. This is what we get to do dose reconstruction.

So, we used a simplistic internal analysis. Why did we do that? Well, radionuclide-specific internal monitoring depends on where the workers conducted their work. SRS is a very large site. Subcontractors in reactor areas likely didn't need plutonium monitoring, but may have needed tritium monitoring or fission products, depending on where they were working. If they were working on the top of the reactors, it's primarily tritium monitoring that they needed. If they were working with the heat exchangers or some of the resin beds, it might be fission products in addition to tritium. Subcontractors in plutonium areas likely didn't need tritium monitoring. Subcontractors at tritium areas likely didn't need plutonium or fission product monitoring.

The fundamental question, again, is, are subcontractors sufficiently represented or bounded in co-exposure models? And we feel you can do this evaluation without necessarily going to RWPs, okay?

Now, let me back up here. The radionuclide-specific, the RWPs and job plans help this because that gives you the location of where the worker is, and so then you can make more of these determinations. But can you look at whether workers are sufficiently represented or bounded in co-exposure models without this? And we believe you can.

This is an example of Attachment B from RPRT-94. And I'm just going to go through the top line here, and then go through a vertical column of 1984 so that you can understand the next slide. But I really encourage, again, please, to the Board Members, to review RPRT-94 in its entirety.

So, the top one is an electrician who started in 1980. So, 1979, there's no data because he didn't work there in that time period. 1980, there is non-tritium bioassay. That's what that "N" stands for. 1981, he has external monitoring and tritium bioassay. That's the "E" and the "T". 1982, he has non-tritium bioassay. 1983, he did not work onsite. Actually, this could be a "she". I'm sorry, I'm using pronouns wrong here. 1984, they did work onsite, but they had no external or internal monitoring. 1985, '86, and '87, they did not work on the site. 1988, there's external monitoring with a whole body count.

So, in the next slide, I'm going to be showing percentages of workers with non-tritium urine bioassay and/or whole body count. Okay? We're basically, just excluding the tritium internal monitoring here.

If you look at 1984, what we're caveating this is the need for external monitoring. So, if you go down the vertical column here 1984, you'll see two red blocks, for the second and third electrician there, where we've just got an "E". That means they were externally monitored. The "nei" for the other workers are they worked onsite where they're not externally monitored or internally monitored. There's an ironworker that did not work onsite that year. The two laborers at the end are externally monitored and monitored in urine bioassay, both of them.

When we go through and calculate these percentages, if it was just these nine people -- and it's not; there's 886 total workers; it varies by year as to how many workers we've got in a year -- this would indicate a monitored percentage of 50 percent. Four workers with external monitoring, two have internal monitoring and two do not. So, it's just that simple of an analysis.

So, here's the NOCTS claimant data. And I want to focus on the green bars here, because that's the NOCTS data over this whole time period from 1972 through 1997 -- 1998 -- I guess '97 for this dataset. Okay.

Now, what you see, I'm going to start from the far right of this particular graph in the 1990s. And what you see here is that, of the claimants that we have, roughly -- well, 1991, over 90 percent of the claimants had some internal monitoring. A higher percentage in 1992. It drops back down to around, let's see, like 75 percent -- or I'm sorry, the internal, it drops down to around 75 percent in like the 1997 time period. Okay?

Now, you go into the mid period, mid-DuPont -- or not mid-DuPont, late DuPont era of 1980-to-1989

timeframe, and you'll see that the subcontractor population in NOCTS is greater than 50 percent, but they're between 50-60. It does go up to around 75 percent in the late 1980s. But you see it's fairly consistent. And when Westinghouse took over you do see an increase in the subcontractor monitoring. Okay?

In the 1970s, it starts out above 50 percent -- these are, again, the green bars -- but then drops down to where, between '73 and '79, only around 10 percent, 5 to 10 percent, of the subcontractor claimants in NOCTS have internal monitoring data. Okay.

So, now, if you compare that to the RWP plutonium analysis, which I've plotted here in the blue solid lines, you see that these are quite similar. Okay? Now, between 1989 and 1990, we had no RWP data to do an evaluation. That's why that's blank. In 1991 forward, that's all areas that we were able to do that sampling with. It's a very nice, robust analysis.

From the 1980 to 1989 time period, we only had the data from one area, A Area. Okay? The green bars are representing all areas. The A Area data is there in the blue. And the same goes for the 1970s. The blue is just one area; the green is all areas. Okay.

So, a summary of the RPRT-94. It's very similar to the RPRT-92. 1990 to 1998, a high percentage of subcontractors, greater than 75 percent for all years, are in NOCTS, were monitored. And, again, we feel they would be sufficiently representative of the co-exposure model.

1980, a moderate percentage, greater than 50 percent of the subcontractors in NOCTS were monitored. And, again, we feel this would be a

sufficient representation of the co-exposure model.

1972 to 1979, initially, a moderate percentage of subcontractors were monitored for internal exposure. However, there's a marked decrease in the late 1970s, followed by a surge of monitoring starting in 1980. Again, a similar pattern was observed in the limited RWP evaluation of just looking at one area in the 1980s, but all areas in the 1990s. Okay. So we've got two different datasets showing us the same thing.

The final group of data that we looked at was the plutonium bioassay logbooks. NIOSH reviewed the available SRS plutonium bioassay logbooks in order to determine a more complete picture of bioassay monitoring practices for subcontractors. We found 11,316 plutonium bioassay samples from subcontractor construction trades workers between 1972 and 1990. This is distributed amongst 7,028 individual subcontractors.

Samples were submitted from at least 23 different areas at the site. Again, the main plutonium areas are F and H area, and A Area was the research and development. So, how are these samples distributed amongst the site? This graph shows that. The two main bars there that you see are F and H area. Where plutonium was separated is where subcontractors were monitored onsite. They comprised the vast majority of the plutonium bioassay.

The third largest bar there is Central Shops. There's no plutonium in Central Shops. However, Central Shops is where subcontractors and construction trades workers in general were dispatched to other areas, such as F and H, to go and conduct their work.

Okay. This is where that routine monitoring comes into play. There are workers out of Central Shops who are subcontractors, but were routinely monitored, sent to other areas.

The C area here is the fourth highest. This is a C, reactor area. However, many people onsite considered C area and Central Shops to be the same area. It wasn't really distinguished very clearly. And so, a lot of those C area samples I believe should be Central Shops. So, that Central Shops is likely a little greater. C area would be more commensurate with the L and K reactor areas over here in total number and size.

Now the limited evaluation that we did showing the workers worked side-by-side one another was just in A Area, which represents a moderately small number of the plutonium bioassays there on the site. Okay? But you can see the bulk of the samples were coming from other areas. All right?

So, when we looked at this same data over time, that temporal evaluation that the Implementation Guide tells us we should be doing, we see the same decrease in plutonium monitoring from 1972 through the 1970s, followed by a significant increase in plutonium monitoring in the 1980s. Okay?

So now, we believe that subcontractors were sufficiently monitored in areas outside of 773-A between 1972 and 1990, and we feel these other graphs, the evaluation demonstrates this. We saw a similar pattern of internal monitoring between the RWP analysis, the NOCTS data analysis, and now, the plutonium bioassay logbook analysis. And that pattern is a decrease in plutonium monitoring in the 1970s, followed by a surge 10 times the plutonium monitoring from the 1978-to-1980 timeframe. It

jumped from 56 samples total to 500.

So, summary and conclusion. There's three sources and evaluation of the subcontractor bioassay data that have been done: the RWP job plan analysis, which is kind of the Cadillac of the evaluations; the RPRT-92 analysis, but there's also the NOCTS claimant data. This is RPRT-94, and this is a pretty important component here that I feel is being overlooked and would encourage you all to please read that report. And the plutonium bioassay logbooks is the third one. All three evaluations are showing similar results, at least for plutonium here.

So, we use a weight-of-evidence approach. In 1990 to 1997, we feel there's robust monitoring of subcontractor construction trades workers. The RWP analysis evaluated the temporal effects for multiple areas in the crafts. And the NOCTS data showed a high percentage, greater than 75 percent, of subcontractors were monitored.

And 1980 to 1989 shows acceptable monitoring of subcontractor construction trades. The job plan, yes, is limited to A Area, but we were able to look at the time periods. We were able to look at crafts. We didn't see any gaps or see any issues associated with that.

We also know that the co-exposure model would be bounded based upon the incident data from F and H area. These are those off-set conditions, and did they do follow-up bioassay? Yes, they did.

The NOCTS data and the plutonium bioassay analysis show a moderate percentage of more than 50 percent of the subcontractors being monitored. In this time period, there's over 10,000 bioassays of subcontractors, or approximately 10,000 subcontractor construction trades worker plutonium

bioassays in this time period. So, to say that they're not representative in the co-exposure model just concerns us to come to that conclusion.

1972 to 1979 is a limited evaluation, and it's a monitoring of subcontractors. The RWP analysis was very limited. The NOCTS data is showing that there's limited monitoring. The plutonium analysis is showing limited monitoring. There's only 1200 bioassays in that time period, plutonium bioassay, but it's 1200 plutonium bioassays amongst subcontractor construction trades workers. So, these are not your routine DuPont workers. These are people hired in under the transients. Okay?

Our evaluation method we feel is conservative. Okay? Did all subcontractor construction trades jobs requiring respirators need bioassay? Did all subcontractors monitored for external need bioassay? Subcontractor work in this timeframe constituted approximately 14 percent of the total construction work. The majority of the construction work was done by DuPont CTWs. This is why we feel the DuPont CTW workers are likely bounding for the subcontractor construction trades.

Now we looked at a sub stratification, and this was presented to the Work Group a couple of weeks ago. And in the graph off to the right you'll see the bar charts of the DuPont CTW plutonium urine graphs in the subcontractor CTWs. It's important to point out here that over 95 percent of the plutonium bioassay data is below the reportable level of .1 dpm. If you think back to that radiological monitoring of the defense-in-depth approach, the whole purpose of the routine and the job-specific bioassay was confirmatory. Okay? That was the rule, was nobody gets an intake. Ninety-five percent of the bioassay here is non-reportable, non-in-depth.

The bioassay data from the DuPont CTWs appear to be slightly greater than the subcontractors, but really not significant here. When co-exposure models are developed based upon this data, the Pu intakes for the two populations are quite similar. And we presented this particular slide as well. And in both cases, both intake regimes are in intervals. In the 1970s and the 1980s, the DuPont CTW 50th percentile was greater than the subcontractor CTWs. However, the 95th percentile was greater in the earlier time period for the DuPont CTWs than it was in the latter years that that the subcontractors were hired.

But, as Dr. Ziemer pointed out during the Work Group meeting, 279 dpm per day is nearly 300; 325 dpm per day is nearly 300. And so, within internal dose monitoring, those numbers are quite similar, which is why we feel that the DuPont CTWs are likely bounding.

But, based upon the NOCTS data analysis, there are six years where the percentage of internal monitoring via non-tritium and whole body county is less than 50 percent. All the other years, it is greater than 50 percent.

To bias a co-exposure model, the exposures to the unmonitored subcontractor construction trades would have to be significantly higher than the monitored subcontractor construction trades. Again, we're not talking about now comparing DuPont's versus subcontractor construction trades. I am just comparing subcontractors to subcontractors here -- okay -- to where, if we were to develop a subcontractor construction trades worker co-exposure model. Okay? In order for that not to be valid, those unmonitored would have to be much greater.

Considering the radiation protection program at Savannah River, the zero intake policy, the defense-in-depth approach to radiological protection, coupled with the health physics coverage of the construction jobs, we just don't believe that that's plausible, when for most years the monitored subcontractors outnumber the number of unmonitored subcontractors.

I mean, if you think back to even the americium example where 34 percent were monitored, we were able to match a very large fraction to workers who were on the same RWP as those monitored workers. Okay? So, it's not like they're just hiring other people, sending them into extreme radiological environments and not monitoring. Okay? We've got a lot of monitoring data amongst subcontractors here.

In this review, we feel we've demonstrated that unmonitored workers worked alongside the monitored workers in the same radiological environment, especially in the 1980-to-1998 time period. The bioassay data within individual records can be used for dose reconstruction for most subcontractor construction trades workers. Most of these workers don't even need a co-exposure model. We have got their own monitoring data. We can do the dose reconstruction based upon it.

These internal monitoring records can also be used to develop co-exposure models and subsequently used for dose reconstruction to either supplement gaps in individual monitoring or to estimate doses to unmonitored workers. We do not see any evidence where subcontractor construction trades workers were not monitored to a degree that would bias the co-exposure models.

And again, you've got to look at the entire weight of

evidence here. Based upon that weight of evidence of these three evaluations, we believe the co-exposure models are bounding and representative of exposures that would be received by an unmonitored subcontractor construction trades worker at Savannah River. Therefore, we conclude that dose reconstruction is feasible.

With that, I'll be happy to answer any questions. Thank you.

Dr. Roberts: Okay. Thank you, Tim.

Actually, can we go ahead and take a break, and then, come back to the session with questions at 3:30? Would anyone object to that?

Member Clawson: That would be great.

Dr. Roberts: Okay. Okay, great. So, hearing no objections, let's meet back at 3:30. Thank you.

(Whereupon, the above-entitled matter went off the record at 3:19 p.m. and resumed at 3:30 p.m.)

Board Work Session

Dr. Roberts: Okay. So, by my clock, I have 3:30.

I just wanted to remind everybody once again just to be mindful of whether or not your phone or computer is on mute. As you are hearing, complicated information is being presented and there are differences between NIOSH and the Work Group. So, it's really important that everybody be able to hear everything that's being presented and discussed. And so, if you could, again, just be very mindful of keeping yourself on mute if you are not speaking, it would be much appreciated.

And I have a couple of other notes for you. So, I did

get a note from Andy that he will have to leave the call at about 3:50, but will be back by about 4:30 p.m.

Also, I should say that, because I have some previous commitments, we do need to wrap up this meeting by 5:30 p.m. Eastern.

So, with that, let me go ahead and open the session first with a roll call again.

So is Anderson here?

(No audible response.)

Okay. Beach?

Member Beach: I'm here.

Dr. Roberts: Clawson?

Member Clawson: Here.

Dr. Roberts: Field?

Member Field: Here.

Dr. Roberts: Kotelchuck?

Member Kotelchuck: Here.

Dr. Roberts: Lockey?

Member Lockey: Here.

Dr. Roberts: Richardson? Richardson?

(No audible response.)

Roessler?

Member Roessler: Here.

Dr. Roberts: Schofield?

Member Schofield: Here.

Dr. Roberts: Valerio?

Member Valerio: I'm here.

Dr. Roberts: Ziemer?

Member Ziemer: Here.

Dr. Roberts: Okay. Has Anderson joined us yet?

(No audible response.)

Okay. How about Richardson?

(No audible response.)

Okay. Well, even though that's the case, I think we can go ahead and proceed with the session.

So, NIOSH or DCAS just finished their presentation on SRS, and we are open for questions.

And, Tim, are you back on the line? I guess I should ask that first.

Dr. Taulbee: Yes, I am. I'm here.

Dr. Roberts: Okay, great.

So, any comments or questions from the Board?

Member Clawson: Well, this is Brad. I've got an awful lot of questions, but I think that we need to let SC&A finish this up, especially with our time restraints, and then, we're just going to have to take questions at the end of this.

Dr. Roberts: Okay.

Member Lockey: This is Jim Lockey. I've got a couple of questions I'd like to ask, I think. I actually

would prefer to ask questions after each, if that's okay.

Member Clawson: Whatever, Jim. But if you want to open it up, I'll start asking, too.

Member Lockey: Okay. So, do you want me to go first, Brad?

Member Clawson: Go ahead.

Member Lockey: Or do you want to go?

Member Clawson: Go ahead.

Member Lockey: So, our Work Group, as Brad shared, has been struggling with this Savannah River for a number of years. It's a very complex issue and very involved, and it has implications going forward for other areas we're looking at. So, I think that it's important that we understand what the playing field here is.

I've gone through this data extensively a number of different times, and every time I go through it, sometimes I get more confused; sometimes I get more enlightened.

But, while I've got Tim on the line here, I'd like to ask him some questions. And one is, one of your slides talked about defense-in-depth and I went through that and it seemed like a reasonable approach in regard to how DuPont was planning to handle their program. The question is, was it done that way and is it reliable?

So, one of the things they talk about, or you talked about, was equal to or less than 2 percent ALI, correct? Or am I missing that?

Dr. Taulbee: Yes. This would be the Annual Dose

Limit.

Member Lockey: Right. So, their goal was to have less than 2 percent, is that right?

Dr. Taulbee: Yes, their goal was to not have any intake in excess of 2 percent of the Annual Limit of 5 rem, which would be 100 millirem.

Member Lockey: Okay. And you might have told us in the past, or maybe this data is available -- and I'm sorry, I'm getting a phone call. I'm afraid, if I press a button, I'll press the wrong button here.

But, anyway, if you look at the data, the bioassay data, how does that fall out? I mean, how many were greater than 2 percent?

Dr. Taulbee: Okay. I'm trying to figure out how to answer this.

Member Lockey: Oh, I understand --

Dr. Taulbee: I mean, the majority of the bioassay are non-detects. Okay?

Member Lockey: Right.

Dr. Taulbee: So, if you look at all of those that are positive, then you can calculate a dose and actually do an assessment here. Now I don't have what the total number of bioassays for all the time period is for Savannah River. We could come up with that. We can certainly tally and come up with that.

We do have a listing of those that had intakes at the site as a whole and what those doses are. If that would help, I can certainly show you that data.

Member Lockey: Tim, I'm trying to figure out -- in paper, they had a good program. I want to know, in fact, if it was a good program. And this Savannah

River has a lot of bioassay data, a lot, right?

Dr. Taulbee: Yes.

Member Lockey: And there's various statistical packages I could apply to that bioassay data and tell you how rigorous this is and how representative it is. But one of the first things I would look at, if their goal was to have people less than 2 percent ALI, then did they achieve that goal? And the second thing I would look at is, okay, the ones that had a greater than 2 percent, how many were above 100 percent of the ALI?

Dr. Taulbee: Okay. Now that's something I could --

Member Lockey: Am I missing something or not with that?

Dr. Taulbee: No. No, that's something that I could possibly show you here. Give me just a second here. I believe I can pull that up.

Member Clawson: Jim, this is Brad. Jim, this is Brad. You need to speak up a little bit.

Dr. Roberts: Yes.

Member Clawson: We're having a hard time hearing you. Okay?

Dr. Roberts: Yes.

Member Lockey: I'm sorry. Is this better? Is it me you're having a hard time or Tim?

Member Clawson: It's Tim.

Member Lockey: Yes, I'm having a hard time. He's breaking up.

Dr. Taulbee: Okay. Let me switch to a headset here.

Hold on just a second.

Okay. Is this better?

Member Lockey: It's better.

Dr. Taulbee: Hello?

Dr. Roberts: Yes.

Dr. Taulbee: Okay. Okay. All right.

And so, one of the things that I could try and show you here is a graphic. You asked what percentage; did they achieve that particular goal? And they didn't really kind of compare along that line. Okay? But what I can show you is those that had intakes, and particularly something like plutonium, those workers that had a plutonium intake and how that dose is distributed here.

So, give me just a second here to get this graphic up and I will show that to you.

Member Lockey: The question is, will I be able to see it?

Dr. Taulbee: I'm hoping. Oh, so you're not seeing my slides right now?

Member Lockey: Well, I'm going to try to do it again. I tried to do it now four times to get back in. I get into the waiting room where I'm put with everybody, but I don't get the -- I got the projections this morning, but not now. I don't know why. So, I'm with everybody else. I see, you know, Zaida and Nancy, but I don't see any of your presentations. I don't know why.

Dr. Taulbee: Oh, great. Okay. Okay. Well, then, I can describe it to you, or at least I hope I can.

All right. I've got it ready, I think. Let's see here. Okay.

And can everybody see this particular slide right now?

There's 868 plutonium intakes at SRS over all time. Okay? Or at least up to 2005.

Do people see this particular graph?

Member Lockey: I got it. I see it.

Member Ziemer: Yes, I see it. Ziemer.

Dr. Taulbee: Okay. All right.

So, the less than 2 percent would be less than 100 millirem, effectively, there. Okay, so .1 rem. And this is committed effective dose equivalent. Okay? So, it's not exactly what we consider annual, but bear with me here that it's CEDE.

So, between 100 millirem and, then, 5 rem, 5 rem would be your Annual Limit. Okay? So, if you go up here and you draw a straight line across, you can see that it looks like the majority of the doses are between -- of the people that would have positive bioassay, which is a small fraction, of those people that would have positive bioassay, the majority of the doses are between the 2 percent and the Annual Limit.

While I was doing that, I did look up -- there are 868 here plutonium intakes shown, and 86 of that 868 are greater than 5 rem CEDE. So, 10 percent would be greater than what that Annual Limit would be.

Mr. Rutherford: Tim, I think I've got something that might be able to help Dr. Lockey, too. It is you've

said that the majority of the number of bioassay samples were non-detects.

Dr. Taulbee: Right.

Mr. Rutherford: So, you've indicated that there's 868 plutonium intakes that were positive from the very earliest days when they started monitoring up through 2007. How many non-detects do we have in comparison to that 868 positives?

Dr. Taulbee: Tens of thousands. I mean, we know from the 1980s that just subcontractors, there's 10,000 bioassay. So, you know, of just the subcontractors, not the routine operations type of folks. So, there are thousands and thousands of samples here from plutonium. We can come up with a total. If you wanted to get those percentages, we can certainly do that.

Member Lockey: As a physician that does clinical population studies, if you showed me a figure that 1 percent is above 100 percent, or .5 percent, the number is very, very low, that reinforces to me to a certain extent that that defense-in-depth program that they had in place would be a relatively vigorous program.

Dr. Taulbee: Okay.

Member Lockey: But that data is very important just to look at the basic question, is there a demonstrated health risk in this population based on the available data? After I went through this for the umpteenth time, I came back to that question: is there a demonstrated health risk based on this huge database that you have available?

Dr. Taulbee: Okay. I mean, we can certainly pull that together. I mean, that is data that we can do and show the total number of samples in a given

year and the percentage that are positive here, and what those consequences are, what those doses are. We can do that.

My impression is -- or not just my impression -- our analysis so far has shown the vast majority are non-detects. Especially when you look at the co-exposure models that we've got in OTIB-81, those are showing what the percentage of non-detect is, and it's really high. Okay.

Member Lockey: Okay. And I'm going to follow up with one question, and then, I'll give it to Brad, because I know he'll have questions.

The second question I have, then, is about the incident data. And I need to ask one basic question about incident data before I go into what I'm looking for. In regards to the incident data, last time we met as a subcommittee, I asked about the incident data and how it was used. And apparently, it's not being used in the dose reconstruction because of chelation issues. Is that correct?

Dr. Taulbee: It depends upon on the level of the incident. Because if it was a severe incident, then they would be chelated and, yes, we would exclude them. However, if it was not a severe incident and they didn't do chelation, we absolutely would continue to include them.

And looking at some of the upper end of the co-exposure model data, clearly, there were some that were incidents that are included in that, in that particular co-exposure model. So, it's a mix.

Member Lockey: So, the incident data that you would not include -- and say I had an incident and I needed to be chelated. Okay? The chelation is based on what? On what data that somebody gets chelated or not?

Dr. Taulbee: It was a decision that was made by the physician and the health physicist at the time as to whether somebody would be chelated.

Member Lockey: Is it made just on the environmental exposure data or is it made on a preliminary bioassay sample?

Dr. Taulbee: It could be on both. If the intake was severely high, the air samples were severely high, they may not wait and go ahead and start chelation. In other cases, they would wait until they got a first bioassay before they would do chelation. So, it's a mix. There was no set criteria from the chelation. It was up to the medical, the physician at the site and in conjunction -- I mean that physician is who made the decision whether to chelate or not, but he did it in conjunction with the health physics department to make that decision.

Member Lockey: Okay. The reason I'm trying to go down this pathway is I'm trying to say, okay, how rigorous is this database? How representative is your database, your exposure database? And does it encompass the subcontractors or does it not?

And one of the ways I would approach that would be I'm going to look at the incidence data for prime contractors and for subcontractors, and I'm going to look at the initial bioassay data that's available after the incident, and to see if there's any difference, to determine whether, did, indeed, the subcontractors -- were they put in job tasks that were potentially more hazardous because the prime subcontractors, for whatever reason, did not get involved with those activities?

Dr. Taulbee: Okay. Where we have examples -- go ahead. I'm sorry.

Member Lockey: I'm looking for a reason in the data

to say that your database is not representative of the subcontractors, not because there's missing data, because you have a lot of data. But is there anything out there that we can use to say, yes, here's an example where subcontractors had very much higher pre-chelation urine bioassay data in comparison to the prime contractors?

Dr. Taulbee: Okay. I think we can go back and look at those incidents in F and H area, that there would be sufficient data for us to look at that. I'm recalling John Cardarelli did a presentation showing an incident and the follow-up associated with that had subcontractors, a mixture of operations folks and subcontractors in that particular incident. And so, now what you're looking at is kind of a compilation of that data.

Member Lockey: I'm looking at subcontractors must have had incidents that occurred that required a needed bioassay and possible chelation. And I'm sure prime contractors had the same type of phenomena that occurred to that. Is there any difference in the urine bioassay results after the incidents in these two groups? Or are they similar?

Dr. Taulbee: I believe they are similar, but that's something that we can look at and do that type of comparison.

But keep in mind that these incidents and these intakes are fairly rare. So, it really would somewhat depend upon the severity of the actual individual incident as to which way that's going to be driven. But I understand what you're talking about here, and we can certainly look at, I believe, in particular, the F and H area incidents that I talked about there, and show you or get you some of that data. I believe that is possible.

Mr. Cardarelli: Tim, this is John. This is John Cardarelli.

Dr. Taulbee: Yes?

Mr. Cardarelli: I was wondering if we could take one minute here, and Liz Brackett does a ton of our analyses for us on this internal. She might have some good insight for us. Would it be okay if she were to give a one-minute summary?

Dr. Taulbee: Sure.

Member Clawson: One minute? We've already been here an hour and --

Dr. Taulbee: Liz, can you give --

Member Clawson: You know, no, I want everybody to remember something of why we're here on this. It's because we've got something brought up before the Board right now: has RPRT-0092 completed what it was supposed to do? And the Work Group has already said no. And we're proceeding on.

This is an entire data dump. I want you guys to remember about Fernald. We had thousands and thousands and hundreds of thousands of urinalysis and stuff like that. But did it do what we needed it to do to do a dose for a coworker model? It did not.

Now this one of the reasons why I wanted a limited presentation and stuff, is because we start to lose focus of what the real issue is here. Now we've been dealing with just this section of it for three years -- three years -- and it hasn't been done.

I can start right now and start going on for about an hour and a half of what Tim has been saying, not that it's wrong, but there's a little discrepancy in some of the things. I've always said this. Savannah

River is different. We keep talking about construction trades workers and sub construction trades workers.

Tim says that we can separate them out by their badges and by their ID. Well, I want you to know a few years ago they tried that and everything else. We came back. They couldn't do that.

All the work that was done at Savannah River, they had their operations people, and then, DuPont and everybody else had their construction work trades that did their work. Then, we had subcontractor construction trades workers who could bounce back and forth without any problems, which we've already talked to, that were brought for high-rad jobs. They were burned out and went back on the road and went from there.

I want to everybody to remember why we are here. I think, right now, I've got a lot more questions that I want to be able to go into, but I think that we need to be able to give SC&A their opportunity, and then, let's discuss this path forward.

Dr. Roberts: Okay. All right. Let me just ask, though, Brad, before we pivot to SC&A, and just ask if anyone else on the Board had any questions for Tim, and then, we can move on to the SC&A presentation.

(No audible response.)

Okay. Well, hearing none, at this time, Joe, did you want to get things going?

Mr. Fitzgerald: Yes. Okay. And I realize half the Board probably has seen a lot of these slides in the Work Group. We had a joint Work Group meeting two weeks ago. So, I will go through some of these quicker than others.

First off, I'm going to try to simplify what the issues are, basically, what Brad just said. You know, there's a lot of data that could be thrown out there. Savannah River is a huge site, a lot of years, thousands of bioassay data points. And once you get weighed into the routine, the incidents, the NOCTS, you can do endless sorts. And certainly Tim has done a good job, and we've seen quite a few of them today. But I'm going to focus exactly, very clearly, on what the issue has been.

Next slide, please.

This has a three-year history, and I think you're familiar with a lot of this. The '92 review that came out in 2019, to which we commented, this was based on a request by this Board back in 2017 to expand the review from what it was, which was a specific review on 773-A for, I think it was five or six years in the early '80s, to one that would encompass the entire site.

The concern there was that any answer on completeness would be proscribed by the limited facility coverage and the years involved. So, that's why the expanded review was done.

There's somebody talking on there, not on mute.

Dr. Roberts: Somebody's talking.

Mr. Fitzgerald: Okay. Next one, please.

I'm on "Background: Job-Specific Bioassays".

Okay. I want to really focus the Board on what this specific issue is. Okay? You know, there's just a lot of dust being kicked up about a lot of different forms of bioassay, whether it's routine, special incident, you name it, NOCTS. But what we're focused on is a particular type of bioassay, job-

specific bioassays. And I wanted to take a few minutes to really define what we're talking about because that is the currency that we're dealing with.

And it gets very confusing when NIOSH starts talking about the sorts that they're doing and some of the quotes they're making about something other than job-specific bioassays. That's the context of our concern. That was the context that was raised originally.

Okay. So, job-specific bioassays are performed for workers when warranted by job internal exposure potential. Okay, these are the bioassays typically required when you have an RWP, a radiological work permit, or in the DuPont era it was a job plan, or SWP, when you had a situation that was atypical. It wasn't a typical radiological work situation or a situation where you had a radionuclide involved that wasn't one that the worker was on routine bioassay for. So, one would order up a special bioassay to cover that particular situation.

Okay. Again, DuPont implemented job plans. RWPs were on the books as a procedural requirement for DuPont. DuPont did not implement them. Okay? And that was something that was cited by the Tiger Team in 1990. There was to be an accountable RWP system where one would, in fact, have required job-specific bioassays that would follow on a particular job that had RWPs, but RWPs were not implemented, and they weren't implemented until the early '90s, when Westinghouse had assumed operational control of this site.

So, essentially, you had a system where you had job plans and SWPs, but you didn't have any accountability necessarily to perform the job-specific bioassays in response to those permits. And this was a large part of the problem with RPRT-92

that we'll get into, is that the objectives of RPRT-92 embodied an expectation that you could survey job plans and RWPs and be able to link the job-specific bioassays for the purposes of looking at the completeness. To what extent could you establish a job-specific bioassay that followed on to a job plan or RWP that specified certain nuclides that needed to be monitored? Okay?

And that all came from a finding that Westinghouse itself made in 1997. What happened was, in late '95 -- I think it was November-December of 1995 -- the field office, DOE field office, made a finding on the job-specific bioassay program that workers were not leaving their bioassays, and it was a significant issue. And Westinghouse responded by doing a series of self-assessments, one of which, the one that's often cited, was a 100 percent survey of the second quarter of 1997.

Lo and behold, they found that only 21 percent of the workers were actually turning in their job-specific bioassays. And I think Tim quickly adds that, oh, well, they went back and they did a re-analysis and were able to find the workers, and the surveys turned out to be negative.

The real question, though, is, given the significance of that incompleteness -- you know, this program has historically talked about incompletenesses of 10 and 20 percent, and those were deemed significant enough to follow up on and try to reconcile what the implications were.

Here is an incompleteness of almost 80 percent of all the bioassays in this particular work category. And why does it matter that almost 80 percent were found missing? Well, one, the percentage is almost unprecedented in EEOICPA, to have 80 percent of any monitoring measurements missing.

The second thing is these are job-specific bioassays. Okay. They're non-routine for non-typical rad work, for unique setups, one-off jobs where you would have to have a job plan or RWP, and you would want to have a bioassay at the end of work. Okay? So, this is significant.

I mean, I think we all are familiar with RWPs and the importance that RWPs have in this system. Well, at Savannah River RWPs did not exist in that traditional sense until the 1992-to-93 timeframe, when Westinghouse upgraded the system and put them back in place.

Okay. So, the question that was posed originally that was the inaugurating factor for RPRT-92 and the entire assessment over the last three years was: how complete are job-specific bioassays for the preceding years? Okay. We know, 1997, we lacked 79 percent of those bioassays. Job-specific permits indicated job-specific bioassays. What's the situation? What's the incompleteness? What is the gap for the years preceding 1997? That was the very simple question.

I mean, this is not a complicated issue. It's a very simple completeness question that we faced at every site and that we do a V&V for at most sites at the very beginning of the review. Savannah River we did not do that. There was no V&V for subcontractor data completeness, and this was something that was picked up at midcourse.

So, the question is, how complete are the preceding years at Savannah River? And what complicates it is the subcontractors, who figure in many, but not all, of the job-specific bioassays, are ones that increasingly toward the late '80s into the '90s were temporary and more transient; were brought in by the hundreds. And they moved around the entire

site.

A lot of them, if you are a carpenter or you are a laborer, you may do one work under one job plan or an RWP at one facility, like 773-A, and the next day you may have to go over to the tank farm and do some construction-type work over there, and you would constantly move around and you would be constantly under different job plans and perhaps different radionuclide source terms.

So, it was certainly important that one would want to capture those bioassays. And unfortunately, because the workers were often transient, the only other way one would possibly capture a positive bioassay would be a termination bioassay. Unfortunately for Savannah River, the termination bioassay program wasn't effective and wasn't upgraded until 1997-98, when, in fact, there was a follow-up activity, due to the self-assessment at that time, to, in fact, make the termination bioassay program an accountable one, where you couldn't have a subcontractor come in and, then, go out without leaving a bioassay.

And that follows for a lot of your radionuclide source terms, like Pu and americium where, yes, okay, they might have been on a pre-scheduled required bioassay, but if they were on the site for a few days and left, and didn't leave a termination bioassay, well, they had no bioassay. That information is lacking.

And the implication of not having this information is you can do all of the distribution sorts you want, you can do all the percentage rate assessments -- and we saw a lot of them today -- but if that information isn't there, you don't know what you don't know. It's missing. That information is not part of the database that you're sorting.

And so, whatever outcomes you get may possibly validate the completeness and representativeness of the routine program. It may show they have a nice incident analysis program, but it's not going to illuminate whether, in fact, the job-specific bioassays are appropriately represented and whether that influences the distribution of doses in a co-exposure model. That is not possible if you're missing as much as 80 percent of that data.

So, that is the issue on job-specific bioassays.

Next one, please.

I want to talk about subcontractors. Okay. Not all subcontractors -- because I think there's a lot of discussion about, you know, how much data do we have on subcontractors. Well, we have a heck of a lot of data. You know, Savannah River is a huge site. There's a lot of monitoring, and as far as routine and incident data, we have considerable data on subcontractors. Not arguing that at all.

The question, though, is, how much job-specific bioassay data do we have for subcontractors and how complete is it? That's the essential question. And again, I've already said this to some extent, but I want to emphasize that we're talking about a category of workers, these subcontractors, that were temporary, intermittent in a lot of cases, short-term, yes, and some actually stayed onsite longer, but certainly that was the nature of the work.

That work changed over time. There were more resident subs in the early '80s than there were toward the late '80s. DuPont had in-house construction and hired their CTWs and subs directly from the union halls. Westinghouse had a construction contractor, Bechtel, which did the same

thing.

And I include a bullet in this slide from '94. You know, we certainly looked at '94, and I don't have any issues with the kinds of analyses and sorts that are in there. I think this illuminates the fact that you had a change in situation as far as the monitoring that might have went on for subs, based on the claimant database. And that's the third bullet. I won't go through that. I think Tim has done quite a bit on that.

The question of sub stratification, I'm not going to dwell on that, but I think we have gone through this a number of times with NIOSH. And I went ahead and used this quote, since I think NIOSH has liberally used our quotes, because I think this one illustrates the concern that we have, that, you know, as far as subs being different than CTWs, I think there is evidence, at the 95th percentile, that there is some differences as far as the exposures that have been seen during the '70s and '80s. We have seen the graphs and we have also interviewed workers that have suggested that, yes -- and this is not unusual at DOE sites -- subs did fulfill a role where what we would call the "dirty work," the dirty radiological work was often given to transient workers that came onsite and would do the work. And that was sometimes how things were handled. That was just based on interviews, but we did get that input. And I think, in this quote, that input was acknowledged.

But, in the final analysis, before getting into a big debate on that question, we question if the job-specific bioassay data itself is missing. And we have not -- and I don't think NIOSH has -- established exactly what the circumstance is pre-1997. Okay. After all this work, I don't think we have a firm answer on the completeness level of job-specific

bioassays SRS-wide for subcontractors.

Okay. Next slide, please.

Okay. As far as 92, we could spend, and the Work Group did spend, days on the different findings. But let me just take the overall conclusion, which is that 92, as far as its conclusion that "a large percentage of subcontractors were monitored for potential intakes while working under a job plan, SWP or RWP."

We would say, yes, but that large percentage, which was quoted as 89 percent -- and I think Tim also said that -- encompasses all subcontractor bioassays -- remember what I was saying as far as distinguishing job-specific versus all -- all subcontractor assays over the entire '72-to-90 period. So, that's kind of washing over all of the periods of time, even periods where you did not have much data. It sort of washes it all together without ascertaining to what extent a permit indicated job-specific bioassays actually were performed.

And this was the specific charge. Okay? I'm going to go back to that. That was the specific charge of this Board, was to come back with a measure of the completeness of job-specific bioassays for that time period for the entire site. Okay?

And the result of RPRT-92 very clearly is that, for 1972 to 1990, we still have only one facility, the same facility we had back in 2016 or 2017, which is 773-A, and even that is for incomplete years. We're missing the late '70s.

Now what I heard in Tim's presentation was that now we can add F and H. Well, we're going to get to that in Finding 5, but F and H is basically an area that was added because of incident data. We have a

problem with that because, in terms of the completeness, it was very clear that Savannah River had a fundamental issue in terms of compliance with job-specific bioassay performance.

Bioassays were not being turned in. It was a loose system, a lot of management issues, a lot of fix-its in 1998 to get that corrected. But, very clearly, there wasn't an accountable system that was compelling workers to, in fact, submit their bioassays and a system that was going to process those.

The incident bioassay program is tied to special bioassays, by and large, and the special bioassay program at Savannah River, like the routine program, is -- unlike the job-specific bioassay program -- is a very sound program that has what one would expect in any modern site, which is a very accountable system that has a number of management checks. And if one were charged with a special bioassay following an incident, I would not be surprised if you had close to 100 percent completeness because you're looking at a very rigorous, compliance-based system when you're dealing with special bioassays.

And that's why, on Finding 4 of our report, we objected to NIOSH complementing its completeness percentages by citing these special bioassays as showing all these very high percentage rate completions. Of course. Of course, you're going to get high completion rates. These were rigorously enforced, unlike job-specific bioassays. So, let me just throw that out, that I believe we have one area upon which one could base any completeness finding on RPRT-92, and that remains just the one area.

Okay. It's not feasible to identify radionuclide-

specific exposure potentials. And it comes down to job plans rarely specified radionuclides. Workers did not sign in and out of SRS areas. The only place where that was happening was 773-A, and that did not change until 1989.

Facility radiological characterization is inadequate. The source term information that would wind on job plans and RWPs was faulty. This was a finding by the Tiger Team in 1990, that SRS-wide facility characterization that was the basis for your type and frequency of bioassays was not working, was inadequate, and was out of conformance with DOE orders. There was only one facility that was, in fact, deemed as in conformance, and that was the Naval Fuel Facility.

So, anyway, I think that gives you a flavor without getting into the five-hour version of what we found in RPRT-92. But, certainly, RPRT-92 did not accomplish the objectives that were laid out in its sampling plan in 2017 and did not, in fact, validate the completeness of job-specific bioassays in the preceding years.

Next slide, please.

I'm not going to dwell on this, but I just want you to know -- you heard weight of evidence -- well, we took the same approach back when we started reviewing this a year or so ago, and we wanted to look at the NIOSH evaluation in 92 from all angles:

From the sampling premise, the assumptions that were used, because the assumptions are all-important to what you end up getting. By virtue of what nuclides you include -- will you just go with one nuclide, which NIOSH tended to do, or you took all the nuclides that should have been on the job plan or RWP and tracked the percentage that did

have that, that would give you another answer. So, we looked at the assumptions from the get-go.

Sampling execution: the question of looking for randomly-selected radiological workers, so that you could evaluate the monitored and unmonitored workers who would be working side by side, the coworker issue, we thought was an essential aspect of this. This is cited in the Implementation Guide. NIOSH agreed that it was something that needed to be ascertained. So, we looked at that in terms of whether they achieved that objective, showing whether you could demonstrate workers working side by side, one monitored versus unmonitored.

And beyond that, we focused on the two operational periods. Now we hear defense-in-depth quite a bit relative to Savannah River. I'm here to tell you that defense-in-depth varied considerably in terms of results. I think Jim Lockey mentioned, yes, that sounds good, but what are the results?

Well, I can tell you the results of defense-in-depth in the DuPont era was such that, when Westinghouse took control of the site, they were forced -- and, of course, the Tiger Team had something to do with it, too -- but they were forced to come up with a radiological improvement program that literally put a technical basis and a 5(q)(i) procedural basis to the rad-monitoring program in place, because there had not been one.

And it was basically founded on DPSOL procedures, very general procedures for which there was very little accountability, and which had hardly any basis in national and DOE standards, national consensus standards and DOE orders. It was pretty much an in-house-based program, insular, expert-based program in the DuPont era.

So, when we talk about the difference between the operational periods, you have a very distinct difference in the management of rad-monitoring in the DuPont era versus following the upgrade that Westinghouse made in the early '90s. And in the Work Group, we went through a series of comparisons, whether it's RWPs, no RWPs, whether you monitored with respiratory protection or you did not, and whether you actually did do a comprehensive source term analysis facility by facility. Night and day between DuPont and Westinghouse.

And finally, the central thesis -- and no matter what words are put in our mouths -- the central thesis of our review is, can bioassays be linked to corresponding work permits, so that monitored subcontractors can be compared with unmonitored subcontractors and data completeness established? That is it. Okay. That is the question that we weighed RPRT-92 against.

Next slide, please.

Okay. We're going to get into the findings, and again, I'm going to go through these relatively fast.

But the first one is there was a premise behind the RPRT-92 survey, the one that was planned and executed a few years ago. And I don't have any fault with the design because this was designed against the Implementation Guide. In terms of completeness, one wanted to measure whether there was a sufficiency of measurements. That's actually in the Guide.

And the way it was approached is, since job-specific bioassays are linked to your RWPs and job plans, the question is, could you survey those plans, those permits, and establish the percentage of job-specific

bioassays that could be linked to those plans or those permits? And if one is talking only 21 percent in 1997, would you see a higher proportion, or not, in the preceding years? So, that was a fundamental premise of the RWP and job plan surveying that was a fundamental part of RPRT-92.

Unfortunately -- and again, this is in retrospect -- only job plans were found in the DuPont era for one facility, 773-A. And that was a fundamental problem because, then, whatever assumptions you made, you would have to look at respirator use and make assumptions regarding whether or not the bioassays that you could find for a particular worker was, in fact, appropriate for that particular permit, job plan, whatever. And this is where you get into, I think, some problems.

And we'll talk about the question of the assumptions that guided it, but the finding here is that the assumed linkage that I think was assumed in 92 that you would find job-specific bioassays that would follow on from a specific identifiable job plan did not exist. There just wasn't any linkage. You could not show that.

Those linkages did not exist at Savannah River until Westinghouse stood up the RWP programs in the early '90s, where you actually had an accountable system where you did, in fact, have trackable bioassays tied to an RWP.

Next one, please.

Okay. Finding 2 I mentioned before. And one of the other fundamental assumptions in RPRT-92 is the fact that you could assign a particular source term to a job plan based on a hierarchy of considerations, one of which was the DPSOL procedures, another of which was the facility type and frequencies.

And finally, there was a 1999 report that provided a modern, system-based characterization of Savannah River source terms that NIOSH would back-extrapolate or back-apply to those facilities to come up with those values.

My problem -- and I think the SC&A's issue -- is that it is very clear that back-applying 1999 characterization information to assign source terms was a reach, but more so in 1999, or 1990, DOE itself in the Tiger Team assessment singled out the facility characterization in support of bioassay type and frequency as being flawed and deficient at Savannah River. And the corrective action was, in fact, to come up with a comprehensive system that would, in fact, assign appropriate source terms to these facilities.

Before this time, in the DuPont era, it was essentially expert-based. Basically, you had facility managers very familiar with the operations -- and these were longstanding operations -- who would basically assign whatever the radiological source term would be to these job plans, whatever.

And, of course, the issue is that, as work changed and as special tasks, one-off tasks became more common, that system just wasn't going to work because there was no facility manager that could keep up-to-date and keep those source terms accurate.

Next one, please.

Okay. Finding 3 we've talked about. I'm not going to dwell any more on this, but, very clearly, Savannah River has -- it's a large site -- many operations, many activities, many facilities. And that was the genesis of the Board's concern in 2017 of having an expanded survey done, so that whatever

answer came back on completeness, it would be a comprehensive answer, not just one that would be singled to one facility, 773-A. And in the end, the only job-specific bioassay sampling -- I'll be very careful with that -- job-specific bioassay sampling that could be done was done for the same facility, 773-A.

Okay. Next one, please.

I've already touched on this. I object to NIOSH including F and H areas, in addition to A Area, as being a measure of completeness. F and H area was added because of the incident information, incident bioassays that were a product of special bioassays that were collected. The special bioassay program is a much different management process than job-specific bioassays. It's apples and oranges. Okay?

Finding 5, we've had this as a long-running concern at Savannah River, records destruction. I think, certainly, we and NIOSH agree that it figured in perhaps the lack of RWPs and job plans that were found. But, at the same time, I think in the end we agree that, empirically, there's so far no evidence that there's records missing, although I will be quick to say that, you know, as far as the worker interviews about destruction of subcontractor records, again, several of the examples included timecards and monitoring records. So, that does give one pause. But, at this point, in terms of the NOCTS information and claimant information, there's no evidence that dosimetry records are missing. So, certainly, we want to make that acknowledgment.

Okay. I want to keep this moving. Bob, I think 6 is yours.

Mr. Barton: Yes. Thanks, Joe.

I'm going to quickly go through SC&A's findings related to reevaluation of those DuPont era job-specific bioassays. And there are about five findings related to that and, also, a finding that sort of deals with the year 1990, which we sort of refer to as one of the transition years.

So here, what we're talking about is americium. And again, it's only for one section of A Area, the F wing, and for a very limited time period, '81 to '87.

And we found that only 20 percent of those worker job-specific and bioassay combinations, that only 20 percent of the workers were actually monitored for americium. Now that's lower than NIOSH's estimate that Tim showed in their presentation. NIOSH estimated it at 34 percent.

And the difference is that it appears NIOSH incorrectly included chest count data that was actually greater than two years past the end of the job date, job plan date. Now, obviously, two years later, I don't think the internal monitoring result is actually related to the job plan. But, more importantly, NIOSH's own internal dose reconstruction procedures dictate that periods longer than two years for chest count data should be considered unmonitored. So, that data should not have been included as potentially a match for a monitored worker. So, if you take those remaining numbers, 20 percent, not 34 percent.

Finding 7 is also related to americium, and this really talks about the concept of "effectively monitored," which Tim mentioned in his presentation regarding RPRT-92. And SC&A defined it a little bit differently. SC&A defined "effectively monitored" as the combination of those workers on a job plan who were directly monitored or the unmonitored workers who were on a job plan with a

directly-monitored worker who was actually being fed in the co-exposure model.

If you're an unmonitored worker and you're on a job plan with someone who was monitored, but those records are not going to be used in a co-exposure model, are you really represented in any subsequent co-exposure model?

And so, we found that 33 percent can be considered effectively monitored. Again, that's 33 percent of the workers surveyed in RPRT-92 were either directly monitored or on a job plan with a worker who was monitored and feeds into the co-exposure model. This is lower than NIOSH's number, which was estimated at 42 percent.

And again, that's due to what we feel is incorrect inclusion of chest count data greater than two years and, also, how we define what an effectively monitored worker is. So, those two combined lower it from 42 percent to 33 percent.

Moving on, this one is just real quick. It's about fission products. We wanted to note that the percentages we came up with were around 70 to 73 percent, based on which period you're looking at, and again, '72 to '74 and '80 -- and that should be '80 to '88, because there weren't actually data available to really evaluate for '89.

And the only thing I wanted to point out here is that all of these results were based on in vivo counting. And that's fine; you can use in vivo to directly monitor. However, the co-exposure models are based on urinalysis data. And so, none of these 70 to 74 percent would feed into any increase really in the effectively monitored population.

Moving back to Finding 9 -- and this is really just a combination of two of the previous findings about

americium -- and that's directly-monitored workers were around 20 percent, and then, we could add on another 13 percent of -- they were on a job plan with the directly-monitored worker who feeds into the co-exposure model. So, you can combine both of those and you get an effectively monitored population of 33 percent, if you add those two numbers together.

Again, I had mentioned there's a finding about 1990. And this is just the fact that Westinghouse took over during 1989, I believe. So, this would be considered the Westinghouse era. However, the data for 1990 are still just as lacking. There was only one radiation work permit, I believe, and there was no associated monitoring.

Okay. Moving along to Finding 11 -- and just trying to keep this thing moving -- this finding is really borne out of the summary conclusions in NIOSH's RPRT-92 that analyze the percentages of subcontractor trade workers that were monitored for at least one radionuclide required on the job plan, not all of them, but just at least one. And they tabulated that.

We don't feel that's really an appropriate metric. For example, does it really matter if a worker on a job plan was monitored for fission products, but was not directly or effectively monitored for the other required radionuclides? The more appropriate metric is whether the workers are directly monitored for all the relevant radionuclides, or really perhaps more importantly, effectively monitored for all of the relevant radionuclides.

I mean, we do a comparison here between our ranges of percentages for appropriately being monitored or covered by the co-exposure model. And as you can see, they're different. Especially

directly monitored, we came up with 47 to 77 percent, based on the time period. And this actually includes the Westinghouse era, which you'll see in a second. And we have the comparisons here with what NIOSH reported in RPRT-92.

And the last slide here is a pretty informative table. Again, this is SC&A's calculation. I think the third column there, "Effectively monitored for all radionuclides," so, again, that would mean the worker was on a job plan and they either had direct monitoring records, they were monitored themselves, or someone else on that job plan was monitored who's getting fed into a co-exposure model.

As you can see, '72 to '74, that number is about 55 percent effectively monitored. No data for '75 to '79. And 66 percent for '80 to -- and again, that should be '88, because the RWP in '89 didn't have any associated monitoring with it.

I think that's it for the findings associated with re-review of the data and RPRT-92.

So, I'll turn it back over to you, Joe.

Mr. Fitzgerald: Okay. Thank you, Bob.

I'm not going to go through the clarifications on the quotes because there's so many quotes to catch up to. But, you know, I'd put at least two of these in context.

And I think the key thing here is that, yes, DuPont handled subs pretty similar to how they handled in-house workers, but that is to the detriment of the subs because they, frankly, suffer from a lack of a termination bioassay program because they were so mobile. And they had an inadequate facility characterization program and an absence of an

RWP. So, if you're a sub, and you're doing that kind of work and relied on job-specific bioassays, yes, you were at a disadvantage to the regular workforce, even though DuPont handled both groups the same.

So, I think I'm going to leave it at that, but when these quotes are thrown out, just remember context is critical and you need to have overall context to understand what's being said.

Next one, please.

Okay. Knowing we're racing the clock, not unusual, I'll go to the conclusions, 1972 to 1990.

And I want to go through these conclusions, and then, since we just received NIOSH's slides right before the meeting, we weren't aware of the new proposal. So, I wanted to also provide our brief comment on that, since we were unable to see that and be able to react to it in our slides. So, I'm going to provide a comment on that.

But the conclusions for '72 to '90, and this is, essentially, the DuPont era with one additional year, is that we conclude that:

NIOSH has been unable to demonstrate the completeness of subcontractor job-specific bioassay data and did not accomplish the objectives defined in its sampling plan for RPRT-92. Okay.

And as Bob just pointed out, in terms of americium, in particular, radionuclide-specific, we found that there was limited associated monitoring to conclude that the co-exposure models would be representative of workers on the job-specific bioassay program. And while higher data completeness is ascribed to other radionuclides of concern, like plutonium and fission products, that

analysis relies on job plan and SWP data from only one facility again, 773-A. And we see no way you can extrapolate that to the other 30-plus facilities at Savannah River.

And I think the bottom line is it remains unknown to what extent, after three years, to what extent past job-specific bioassays are incomplete, but it is known that the gap in 1997, 79 percent incomplete, was significant. And the weight of evidence provided by SC&A's review, in our view, invalidates the inclusion of at least that pre-1991 subcontractor data as being demonstrated sufficiently complete and representative for use in the SRS co-exposure model.

And this gets to the issue that, as the Implementation Guide provides, the completeness of the data comes first. One has to validate the completeness before you start talking about workarounds, looking at other ways that one can manipulate data, looking at distributions, looking at incident files, NOCTS. One has to look at completeness first. Otherwise, you're not dealing with all the cards in the deck. In this case, we don't think that completeness question was settled by 92.

Okay. For '91-98, our conclusion there is that, yes, you have many more RWPs for more than just 773-A. That provides an avenue, but not necessarily a conclusionary one, for establishing the completeness of those job-specific bioassays in that period. This is the period right before the 1997 finding that precipitated this whole survey.

And the reason we hedge our bets on this latter period, even though there is more RWP data, is that Westinghouse, when it did its self-assessment during the 1997-98 enforcement moratorium -- and there was a DOE-wide enforcement moratorium on

bioassay programs because they found the same issue at a number of sites -- Mound, Los Alamos, Brookhaven I think, and Savannah River, to name at least four -- where bioassays were not being collected at a high percentage rate.

And rather than citing and fining all these sites, they decided to give everybody a 90-day moratorium to self-assess. Well, Savannah River self-assessed and identified a number of longstanding management system deficiencies in how job-specific bioassays were being administered at the site and came up with a corrective action program. We have a copy of that. But these were pretty fundamental fixes in procedures, in management accountability, and the system that was used.

So, our concern is, if it was that fundamental and you had this many bioassays that went missing in '97, how could one be so sure that the completeness in '96, '95, and '94 was any better, and particularly given the milestone of a DOE finding in 1990 that they weren't collecting and holding the workers accountable for bioassays?

So, this latter period is one that is troublesome to us, although, again, we acknowledge that there are more permits to look at and perhaps more data. And it's certainly later in the timeframe. And it's a management system that was more modernized under Westinghouse.

So, it gives you more confidence that, if, in fact, you would establish something, it would be established in that time period. But, again, the asterisk is that Westinghouse was the one that was cited, and the management findings are that these were longstanding, fundamental flaws in the way those programs were being managed.

Okay. Finally, I want to, again, not take up too much more time. I hope my voice survives.

But I want to provide some comments regarding Tim's latest approach to determining completeness now that it has crystalized into a formal proposal. And I want to read these into the record, again, because we just didn't have a chance to provide any slides on it.

Okay. In terms of the proposal, I guess, simply put, we would say we believe it won't suffice to resolve the issues that we've been talking about.

And if RPRT-92 was NIOSH's Plan A for demonstrating data completeness for subcontractor job-specific bioassays, we believe, as we just concluded, it cannot be accomplished with the information available.

And NIOSH is now proposing to the Board a new Plan A plus B, with B being NOCTS logbook data, and I think a number of other things -- I didn't catch all of it -- much of which, we would add, was available three years ago at the beginning of this effort.

We looked at RPRT-94, and Tim's early proposal was discussed at the December 2019 Work Group meeting. RPRT-94, while informative, does not alter our findings and conclusions relative to RPRT-92 and the completeness of subcontractor job-specific bioassay data at Savannah River.

As Brad noted earlier, NOCTS data was an early option looked at by NIOSH for this completeness review some years ago, and it was not pursued. We and the Board agreed at that time that the review and sampling, in addition, for RPRT-92 was the right course of action, given the co-exposure guidelines.

While the co-exposure guidelines do suggest NOCTS data as a, quote, "useful starting point" to look at a distribution of samples, and NIOSH did, I'll say, a sound job with that analysis for RPRT-94, it is not enough for ascertaining job-specific bioassay completeness for Savannah River.

As NIOSH's co-exposure guidance emphasizes, data completeness needs to be, quote, "determined," unquote, from sufficient measurements and, quote, "established," unquote, from monitored workers with comparable activities and relationships to the radiation environment. We do not see this as feasible with NOCTS.

As Tim pointed out last year in our December 2019 Work Group meeting, there is a potential detriment to a NOCTS-based approach, such as what's being envisioned in RPRT-94. And what he had to say is we can't directly compare coworkers; therefore, the data completeness must be inferred.

While he justified using NOCTS for its simplicity, timeliness, and resource efficiency, we find such a tradeoff of concern. Data completeness and representativeness should not be inferred or judged from NOCTS for expediency's sake.

And as a Board Member noted during that discussion back on December 5th of 2019, care also needs to be taken, as NOCTS is not necessarily representative of a site's actual workforce.

Under NIOSH's latest proposal, the A plus B option -- this is RPRT-92 plus RPRT-94, plus logbooks, plus whatever -- we still have not determined whether there are sufficient job-specific bioassay measurements for subs, and we certainly cannot compare coworkers with similar exposure potential, which in the final analysis will not answer the

specific questions posed by the Board back in 2017, the first of which was, if almost 80 percent of your job-specific bioassays, not routine, not NOCTS, not logbooks, not incident, but job-specific bioassays, were missed at Savannah River in 1997, how can NIOSH account for their completeness in the years before it?

The second question is, how can NIOSH provide assurance that a co-exposure model for construction trade workers is representative of subcontractors on job-specific bioassays when such a potentially wide gap of permit-required bioassay measurements exist?

Okay. Finally, SC&A continues to view RPRT-92 as the completeness analysis whose objectives best track the tenets of IG-006 Guide, despite the ultimate lack of documentation and programmatic issues that precluded an adequate result for at least '72 to '90. So, it wasn't for want of a sampling plan that was consistent with the Guide that was the problem. It was just the lack of records and some of the management issues in the early time period that precluded the outcome that was desired.

So, again, though, I don't see how this expansion into all these other so-called weight-of-evidence avenues is going to do anything but diffuse what is a very basic question that needs to be answered, and was not answered by the survey over the last two or three years that was designed to do so.

So, anyway, I think that's all we have, and certainly, we'll take any questions.

Member Clawson: Thank you, Joe. I appreciate that.

So, why don't we open it up to the Board for any questions?

I want you to realize one thing, though. As the Savannah River Work Group, we looked at this very, very carefully. And if you notice the dates that I'm bringing up, '72 to '90, the reason is that, in my eyes, it's cut and dry; there's no issues.

Now, from '91 on, there's questions of that they will be able to perform this. We frameworked this for this reason, because if we're not, we're looking at a very, very, very big timeframe and there's a lot of things that fall into it. And this is why we cut it down to 1990. This is when Westinghouse took over. Actually, I call it the DuPont era.

I want you to think about this because this has been three years, and I'm not saying that there's time restraints or anything else like that, but at some time we have to be able to deal with this. And this is why I looked at it in this framework of '72 to 1990, because, to me, there is no question, no ifs, ands, or buts, it did not meet what the requirements were. That's my personal opinion. You guys all have yours.

So, I open it up to the rest of the Board for any questions that they have at this time.

Member Ziemer: Brad, I have a question. Oh, go ahead.

Dr. Roberts: Go ahead, Paul.

Member Ziemer: This is Paul.

I think my question will go to Tim Taulbee. And it's my understanding -- I want to ask something about the incident reports -- my understanding is that both SC&A and NIOSH agreed that the incident data would not be used if there were a coworker or a co-exposure model, is that correct?

Dr. Taulbee: That's not entirely correct, no, sir.

Member Ziemer: Well, let me ask my basic question first, and then, we can follow up, if necessary.

But let us say that a worker was working in any of the facilities without a work permit or a job-specific permit, and an incident occurred. Would that individual -- let's say a subcontractor -- if an incident occurred, would they not be followed up, regardless of whether there was a job-specific permit or not? Or do we know the answer to that?

Dr. Taulbee: That is correct, Dr. Ziemer, they would be followed up. Whether they would appear in the co-exposure model depends upon the severity. If the severity of the incident was enough that they would do chelations, they wouldn't appear in the co-exposure model. If it wasn't a severe incident, then those positive bioassays would appear in the co-exposure model, but they would be followed up.

Member Ziemer: Okay. I was trying to get a feel for whether or not that the incident data, which, presumably, would be the highest bioassay data, would cover, or not cover, workers, whether or not there was a job-specific bioassay requirement.

Mr. Fitzgerald: Paul, can I respond a little bit on that?

Member Ziemer: Yes, Joe, I'd appreciate either of you, the two of you.

Mr. Fitzgerald: Yes, my concern is, before you get to that question, we don't know what radionuclides, what exposures, were tied or linked to these job-specific bioassays that are missing because we don't know the degree to which we have them. But if they are, in fact -- and this is the reason I put the definition of job-specific bioassays up -- if they were

used when you were dealing with non-routine radionuclides and atypical rad work, which is kind of the definition of an RWP anyway, then if it's missing, you literally don't know. I mean, you don't know what nuclides may have figured in those exposures. You don't even know if there were exposures and to what degree they might have been high or not. The fact that the data is missing hamstrings you from even drawing conclusions.

That's the problem with the data completeness issue. One has to ascertain the completeness first before you can go further and decide what the data tells you. And I find -- you know, I'm not saying that the analyses that NIOSH has done is not comprehensive, certainly not attentive to all the different avenues one can come up with analyses -- I'm just saying that the very first question that we always ask at the very beginning of a Site Profile and an SEC, which is the V&V, "Do we have all the data that we need?", wasn't asked for subcontractors and wasn't certainly ascertained for job-specific bioassays.

So, we are now going sort of after the fact and going backwards trying to figure out, is there any way we can see if we do have enough of that data that we can do a co-exposure model, and we haven't lost whatever information was in those bioassays.

Member Ziemer: Yes, I understand. I understand that point. I was trying to get at the idea of whether or not an incident, regardless of where or what it involved, an incident being reported would require a follow-up, and it sounds like it would.

Mr. Fitzgerald: Yes, it would. It would. Because the special bioassay program I think would be --

Member Ziemer: Right.

Mr. Fitzgerald: -- was a pretty sound program at Savannah River.

Member Ziemer: Right. Yes. Okay. Now my other, if I could just follow up with one other comment at this point? And I might preface this by saying that I really appreciate the analysis that both of the groups have done, NIOSH and SC&A. I think they've given us a great deal to think about and evaluate.

Well, let me also say that I appreciate the lack of both the rigor and procedures that are reflected in those early years. I'm certainly one that uses the Tiger Team as a turning point for many of the facilities. But we find that lack of vigor in a lot of different places.

But, in any event, my question is, did the lack of job-specific bioassays -- or are job-specific bioassays needed to develop a co-exposure model? I know that NIOSH was not able to demonstrate that they had these over the full site. They had it for one facility, because they just aren't there.

But my question is, does that preclude developing a co-exposure model from the data that is available? I must say that I found NIOSH's presentation on this pretty compelling.

Dr. Taulbee: If I may answer first? And then, you could go, Joe.

Yes, we believe that the job-specific bioassays are not a critical component for developing the co-exposure models, primarily due to their just sheer number in volume. Most of the subcontractors at the Savannah River Site were on a routine bioassay monitoring program. So, if they didn't leave this job-specific bioassay, six months or a year later,

they would leave a routine bioassay. And so, for estimating their dose, it's not critical because we have a bioassay measurement of that worker who worked in that environment.

And so, for the development of the co-exposure models, when we look across larger periods of time, we calculate the TWOPOS values on a per-year basis. We don't believe that these job-specific bioassays are that critical.

The numbers that I showed on my one graph, those are directly out of those assessments. And so, when you're looking at 256 missing bioassays, which would come back to just 324 job-specific bioassays total -- that's that only 21 percent compliance -- that's out of 6,000 bioassays for that particular site at that time. So, when you consider the 300 versus the 6,000, now, granted, a lot of the 6,000 are operations workers, but a significant fraction of them are subcontractors. And looking at plutonium bioassay logbooks, in the 1980s, you're looking at 10,000 plutonium bioassays in that time period. So, the number of job-specific is very small compared to the routine. So, we don't believe that those missing bioassays are actually going to impact those co-exposure models that we've developed.

And now, I'll leave it to Joe.

Mr. Fitzgerald: Okay. We put up the slide on job-specific bioassays with the express purpose of showing that this is a category of bioassays that you can't just sweep under and assume would be subsumed by your routines without establishing whether or not you can characterize what you have.

And this all started with the notion, and certainly, DOE felt strongly enough about it, and I find NIOSH using the same arguments that Westinghouse used

in the enforcement conference with DOE: "We have lots of routine data. We have a very sound defense-in-depth program, and these job-specific bioassays don't matter that much. We do them just to verify. So, you know, what's the big deal?"

Well, I think DOE's response is very clear. The big deal is that these, in fact, identify exposures that may result from atypical work situations. They may result from unusual nuclide mixes. Nuclides, they're not routine nuclides. That was the whole definition of why you would do a job-specific bioassay.

The job-specific bioassays are linked to radiological work permits, job plans. Okay? So, this is not your normal, routine work. These are ones that require a work permit that establishes a certain approach to the work, requires protective equipment, and attention to certain hazards.

So, there's this whole notion that, "It just doesn't matter. What is the big deal? We can subsume this into a larger database," which I find to be very similar to how this is approached by Westinghouse.

So, the problem when you have subcontractors in that mix as well is that, contrary to what Tim was saying, you can't assume you're going to catch them on the pre-scheduled bioassay. They could be in and out without a termination bioassay and they don't have any bioassay record, end-of-job record. You know, you're just lacking that.

So, I'll just leave it at that, but -- hello?

Dr. Roberts: Hello. Yes, someone needs to go on mute, please.

Mr. Fitzgerald: Hello?

Dr. Roberts: Okay.

Mr. Fitzgerald: Yes, just to round that off, I mean, just think of the worker category or the bioassay category that one could be writing off as something that is subsumed by your routine data, and what you're talking about is the very specific non-typical, non-routine exposures, potential exposures that figure in RWPs, job plans, and job-specific bioassays. This is not sort of an extraneous outlier as far as a category of either exposures or bioassays. I think it is a rather significant component of the radiological monitoring program.

And again, to be missing 80 percent of those, and to have a DOE-wide moratorium covering some 20 or 30 sites with a major fine, citation and fine, on Savannah River, I think all of that speaks to the importance of the program.

So, again, we wouldn't be here today after three years if that importance wasn't recognized from the beginning by this Board when this survey was inaugurated in 2017. So, if we're asking the question, "What's the big deal?", well, the big deal in 2017 was this gap, potential gap, was seen as a significant gap in terms of co-exposure modeling. And I don't see any change from then to now.

And we had lots of data. We had lots of routine data back in 2017, and that wasn't sufficient to not address this issue. So, I guess I'm concerned that we're retreating from, I think, a stance that was taken three years ago on this, and I don't see any basis other than the fact that there's a lot of data, which was certainly the condition three years ago.

Dr. Taulbee: I would really like to follow up on that very last comment there. I think a lot has happened in the last three years. This is the evaluation that we did in the 1990s. That was the discussion at that time period of the multiple areas and "Can you

prove that construction trades workers worked, unmonitored subcontractors worked on the same RWPs as workers who were monitored?" Those were all questions that were not answered back in 2017.

So, I do want to emphasize that we have learned a lot more since then. We've been able to demonstrate that those unmonitored workers worked on the same RWPs as monitored workers, and RPRT-92 does that.

We were able to demonstrate that in multiple areas across multiple years in the 1991-through-1997 time period. Now, in the 1980 time period, we were only able to demonstrate it, though, within one area. Okay? But we saw the same thing. We saw workers, unmonitored workers, on the same RWPs or job plans as the monitored workers. So, that answered a very big question there of the unmonitored workers, were they actually represented by monitored workers? And I think that's an important point here.

Mr. Fitzgerald: It was information that was developed, but we looked specifically at the bottom-line question. That's why I emphasized that in the conclusions that we just provided.

Can one establish the completeness of job-specific bioassays preceding 1997? And I think we are very clear that there was a lot learned and there was a lot of pairing that was possible in the '90s, and that did not, in fact, happen in the '70s and '80s.

And that's the basis for our saying that it was a good-faith effort, a lot was learned, there was a lot of effort put into it, but the availability of the records and the management shortfalls that you mentioned, that, you know, it just wasn't possible to link some of this back in the DuPont era, kind of

brings us to this point of saying, as far as completeness on this particular matter, one can't demonstrate it by virtue of 92. And that was certainly the thesis that was being examined for the two-year or three-year period.

And so, that brings us back to, what do we do with that? And that's our conclusion: that really we're back to the point where we've learned something. We have established where the data is available. But, for the DuPont era, for those reasons, one cannot establish the completeness of job-specific bioassay data sufficient to provide a representativeness in the co-exposure model.

And, yes, I know you disagree, but, as far as the objectives of 92 in terms of delivering those answers, for '72 to '90, those answers were not delivered for SRS as a whole. And I think that's kind of where we've arrived at this point in time.

Member Beach: This is Josie. Can I jump in with and have a process question here of the Work Group?

Dr. Roberts: Sure.

People need to be on mute. If everyone could mute except for Josie, please, at this point, that would be great.

And, Josie, after your question, just in the interest of time, I'd like to give the Petitioners a chance to step in and present as well. So, we'll go with your question and get an answer to it.

Member Beach: Okay. So, mine is a process question. Has the Work Group made a formal motion or a recommendation, and has it been seconded? Is that something you're planning on doing, Brad?

Member Clawson: Okay. All right. Yes, we've already done that in the Work Group. We're bringing it to the Advisory Board now to be able to put that forth.

Member Beach: Okay. So, the motion, we are talking about the motion that's been formalized at this point, is that correct? I didn't know if you needed to bring it before the Board, and then, with the discussion.

Member Clawson: Yes. Yes, we do. We need to bring it before the Board, but we were trying to get through this. And Rashaun leaves at 5:30. I want us all to remember that we have brought this to the Board for this vote. So, yes, we do have to bring this before it.

Member Beach: Okay. Thank you. Thank you so much.

Dr. Roberts: So, I do want to give, if there is any public member or Petitioner still with us, please, we welcome you to make your presentation or comments at this time.

Public Comment

Warren Johnson

Mr. Johnson: Thank you.

This is Warren Johnson, an attorney for the Petitioner.

And as I understand it, I've got about -- there's 19 minutes left in this meeting, and I certainly hope you're going to have the opportunity to vote. So, I'll keep this very short.

Quite frankly, this petition was filed November of

2007. And that was based on the fact that NIOSH has, every time they've proposed a way to meet their charge, which is to bind a dose, to demonstrate it's feasible to bind a dose with sufficient accuracy, then there have been deficiencies that SC&A has demonstrated that shows that's not the way to do it, and they have to revise the approach. And that has gone on for -- at this point, we're now 13 years down the road.

Three years ago, there was, essentially, the same -- well, what's happened at every meeting, which is, okay, this is not the appropriate path forward. This does not demonstrate with sufficient accuracy. Therefore, here's the path we're going to propose. That's been NIOSH's position every time.

Three years ago, it was, okay, this is the way we'll do it. This RPRT-92 will save this. It will prove the completeness, and therefore, there will be no SEC granted, and we'll continue on with dose reconstructions.

RPRT-92 failed. And I, unfortunately, don't have the transcript from the November meeting with the Work Group, but that was admitted to by both, I believe it was Mr. Cardarelli as well as Mr. Taulbee, that critical data is missing. That's what they said.

But now, we just changed the subject yet again. We don't really need 92, even though that was their proposal; that was the way that this would be demonstrated. It didn't happen.

I say this every opportunity I get, but you cannot ignore time. People are dying. The very people that this program was intended to benefit, they're dying and they're not getting the care they need.

And it's all because, no matter what, NIOSH is never going to let this go. They will find a way to

compound guesses on top of estimates, manipulate the data, and get to a result.

What I keep hearing about is this defense-in-depth program. And that's why routine bioassays weren't really that important; they were just to show the program was working. Well, that's a policy.

I've looked through thousands of pages of these records for my clients. And there used to be an old policy that was on the letterhead of DuPont that said, "Don't say it; write it." Well, we're missing all the records which would confirm that they followed the policy.

And I know there's a debate over whether those records were lost, misfiled, or shredded. There's a lot of evidence indicating, well, certainly, a lot of statements from employees that were witnesses to the shredding of documents. Now we assume that the documents that were shredded must not have been important, I think is what NIOSH said the last time. Again, that's not claimant-favorable.

And now, we're here today, three years later, 92 wasn't really important; we're going to do it yet another way. Time is a component of feasibility. So is money. Hundreds of millions of dollars is being paid to ORAU to do these programs, this reconstructions, and to turn around and find yet another technical bulletin and yet another proposed way to go. Meanwhile, the very people who were supposed to be served are suffering. It's not right.

Where we are today -- despite in November when they said critical data is missing, and therefore, 92 is flawed -- now I'm hearing, well, it's not really a critical component.

Member Beach: Excuse me for a second.

Mr. Johnson: Yes, ma'am.

Member Beach: And this is Josie.

And I am not trying to be rude at all, but if we're going to bring this to a vote, we need to do it soon. So, just letting you know that.

Mr. Johnson: Yes, ma'am. Okay.

In addition, the last couple of things I do want to comment on. Excluding the severe incidents, meaning the people who had a high enough uptake to need to be chelated -- so, we take them out of the equation -- and then, excluding the job-specific bioassays, obviously, that eliminates many of the higher exposures and falsely lowers the coworker model.

Going back to the point about the 868 plutonium intakes ever, that's based only on the workers who had a special bioassay and were assigned a dose. If somebody popped up on a routine above the technical limit, that didn't go into that statistic.

Again, there's just too many guesses, too many estimates, assumptions. And as such, the only plausible or the only path forward is to recognize that there is no way to demonstrate, to bind a dose with sufficient accuracy, and it's certainly not feasible. If we don't move forward this way, it's going to be many more years before the next proposal comes out. And again, the claimants are suffering from this.

And so, I certainly feel that it's more than appropriate to go ahead and grant this and I certainly hope you do so.

But thank you for your time, and I'll stop. Thank you.

Member Lockey: Hey, Joe, this is Jim Lockey. Are you there, Joe?

Mr. Fitzgerald: I'm here.

Member Lockey: I just have a few questions to ask you.

Are you aware, is there any data (telephonic interference) by us in the database --

Mr. Fitzgerald: I'm sorry, say it again?

Member Lockey: Is there any current data that you're aware of in the current exposure bioassay database that indicates that the subcontractors were not encompassed by that database? I know all the limitations of the job-specific, and I agree with those limitations. I'm just wondering, when you look at the current database, is there any objective data that says, yes, this data indicates they did not encompass some of the subcontractors?

Mr. Fitzgerald: Just the finding in 1997 that, clearly, all that data was missing. That's the only real indication that --

Member Lockey: There's missing data, but none of the data exists to differentiate the subcontractors from the contractors?

Mr. Fitzgerald: Yes, again, there's no easy way to know that. And that was the purpose of 92, was to do the match-ups, so that one could look at that particular --

Member Lockey: No, I know the --

Mr. Fitzgerald: I'm just saying that I haven't seen anything else that sheds light on that. The question that we posed was a very simple one: can we

assume there was completeness in that data going back? And so far, we have not been able to see that. That's the only question that was asked in 92.

Member Lockey: That segues me into the second question. At least in some of the studies that I got involved with, we have an extensive exposure-monitoring database and bioassay database. And where we have extensive and we have data missing, we approach it to supply very statistical models to that to really determine as to the quality of the data and does the data really -- is it really representative of what we think the data demonstrates, such as resampling and sampling techniques or bootstrapping techniques? Did your group apply that to this database?

Mr. Fitzgerald: There's no way to treat this data because there's no notion of whether it was collected regularly. There's no linkage between the data and the permits that may have required it. It is all loosey-goosey.

So, in terms of actually doing an analysis, it's not clear what data you have to analyze. The routine program, the incident program, that was all managed very clearly in a very stable manner. The job-specific bioassay program, whether it's RWP or job plans, was not. So, you have a much different situation and one that doesn't lend itself to those kinds of analyses.

You have to make some wide assumptions about what that data might be, and it's very speculative to compare what you have on the routine side to what that data might actually be. '97 is the only year we actually have some good idea. We don't have an idea going further back than that.

So, you have to make assumptions. And the

question is, does the Implementation Guide give you that leeway to make that jump? We think it does not, that one does need to establish completeness before you do anything else. And we haven't seen that.

Member Lockey: I wasn't looking at data in relationship to specific job tasks. I was just looking at the bioassay data in relationship to prime contractors and subcontractors, specific radionuclides, locations, and year.

And, you know, bootstrapping really does assign a measure of accuracy. It looks at bias. It looks at variances. It looks at confidence intervals. It looks at predictive areas. And it can really tell you by resampling/sampling how rigorous that bell-shaped curve is and whether it's representative.

I don't know if you're familiar with that technique, but it's routinely used in this type of sampling databases, large databases, and there is a concern whether they truly are representative of the population that's being surveyed.

I'm just looking, Joe, for some objective evidence. And I agree with you that the job-specific bioassay data as we defined it three years ago is lacking, but it would be nice to know that the database was looked at and see if there is any objective determination that we have (telephonic interference) fact it did make an impact.

Member Clawson: This is Brad.

I want to remind everybody, you know, while we could go on for years -- and like we said numerous times, this isn't a science project -- this is a compensation program. I brought this before the Board to have a vote.

And I'm going to throw that out right now, that the Advisory Board consider an SEC Class for subcontractor employees at SRS from October 1st, 1972 to December 31, 1990. And that's what the issue is and that's what I've put out in that. And that's what we voted on in the Work Group, and that's what I'm bringing forth before the Board now.

Do I have a second for that?

Member Beach: This is Josie. You have a second.

Member Clawson: Then, we need to vote on it.

Dr. Roberts: Should we have discussion?

Member Clawson: I think we have to have discussion, don't we?

Dr. Roberts: Yes. Yes.

Member Clawson: Let's have a discussion on it.

Ms. Naylor: Hi. This is Jenny with OGC.

Can you express out the motion a bit more, so that it's a bit more clearly formed, rather than just a concept at this point? So, for example, what is the insensibility? And also, if you can just describe what the contractor population --

Member Clawson: Sure, Jenny. If you look at the back page, look at the back page of my slide, and it gives you all of that. You've got everything. The basis included:

Unmonitored subcontractor construction trade worker who should have been monitored under work permits and job plans for job-specific bioassays, but were not.

Potential for elevated exposures at various site

locations at intermittent times. Subcontractors were often transient, performed high-exposure potential jobs under job plans and permits, and it did not provide termination bioassays.

Ms. Naylor: And, Brad, do you get the sense from DOL that this is a Class Definition that could be administered?

Member Clawson: We're not getting into the Class Definition right yet because we've got to vote on this first. You're kind of putting the cart before the horse. Once we get the vote on this, we can take and submit it the way we need to for DOL to be able to perform what they need to be able to do.

Dr. Roberts: Brad, this is Rashaun.

Member Clawson: Yes?

Dr. Roberts: We are going to need to get more specificity around the definition of the Class. And we're at 5:26. I understand your sense of urgency to get this through, but I'm afraid that the Board Members haven't had adequate time to continue to discuss this. So, I don't know the wisdom about continuing --

Member Clawson: It's been almost every year we have gone through this --

Dr. Roberts: Right.

Member Clawson: -- the last three years.

Dr. Roberts: I understand. But I am concerned that the --

Member Beach: Can we vote to table the motion?

Dr. Roberts: Yes. Yes.

Member Beach: I mean, I don't know that we have any other option at this point, is that correct?

Dr. Roberts: Yes. Yes, I think that is a potential --

Member Ziemer: Are you (telephonic interference) to a certain time, Josie, a week from now or something like that, or what?

Member Beach: Well, we would need to reconvene the Board meeting in order to continue the discussion, and we don't have time now. So, what else would -- I mean, there's a motion on the table, correct? So, you would have to table --

Member Ziemer: There is a motion on the table. If you moved to table it, a tabling motion takes precedence and is not debatable. So, if somebody seconds the tabling motion, we have to vote immediately on tabling.

Member Beach: Okay. Is there any other thing you suggest at this point, since we're running out of time, Paul?

Member Ziemer: No, I was asking whether your tabling motion was going to include a time to pull it from the table.

Member Kotelchuck: Well, tabling -- I mean, we would normally discuss this at our next meeting. I understood that it was brought up for consideration. If we had time, I'd vote on it now, but we don't have to do a resolution. It will come up at our next meeting automatically.

Member Beach: And this is Josie again.

I would say, at our January meeting, it would be tabled until that point, where we could pick up discussion.

Dr. Roberts: At what January meeting are you referring? What are you referring --

Member Beach: To the next Board meeting.

Dr. Roberts: The next? Okay. So, the next one is in February --

Member Beach: Oh, I'm sorry.

Dr. Roberts: -- as a teleconference.

Member Beach: Okay.

Dr. Roberts: Okay.

Member Beach: Unless we convene a special meeting, and that's up to you. Otherwise, we'll have to table it until the 13th, or whenever. When's our call? I'm sorry, February --

Dr. Roberts: I don't have the schedule.

Member Beach: February 24th is our next Board call, unless we convene a special one.

Member Kotelchuck: We have to have people -- it has to be a public meeting. It can't be a telephone conference call. People from the public have to be able to be there.

I just didn't realize that we had to push the time to get it voted on by the end of the day. I thought we were considering it, and I assumed it will come up. The actual next meeting is April.

Member Ziemer: This is Ziemer.

The February meeting is a public meeting.

Dr. Roberts: That is a public meeting.

Member Kotelchuck: Okay.

Dr. Roberts: Yes.

Member Kotelchuck: Good. All right. Fine.

Dr. Roberts: That's a public meeting.

Member Beach: So, then, the motion is to table until the next February public meeting. I believe that was the 24th, correct? So, it needs a second.

Member Anderson: I'll second it. It's Andy.

Dr. Roberts: Okay. Okay. And now, we need to vote --

Member Clawson: Sure.

Dr. Roberts: -- on tabling.

Okay. So, Anderson?

Member Anderson: Yes.

Dr. Roberts: Beach?

Member Beach: Yes.

Dr. Roberts: Clawson?

Member Clawson: No.

Dr. Roberts: Field?

Member Field: Yes.

Dr. Roberts: Kotelchuck?

Member Kotelchuck: Yes.

Dr. Roberts: Lockey?

Member Lockey: Yes.

Dr. Roberts: Richardson? Richardson?

(No audible response.)

Roessler?

Member Roessler: Yes.

Dr. Roberts: Schofield?

Member Schofield: Yes.

Dr. Roberts: Valerio?

Member Valerio: Yes.

Dr. Roberts: Ziemer?

Member Ziemer: Yes.

Dr. Roberts: Okay. And is Richardson able to register a vote?

(No audible response.)

Okay. Well, it sounds like, regardless, the majority has agreed to, has voted to table this until our February 24th meeting.

Member Lockey: And what are we going to do between now and then?

Member Clawson: You guys are going to read an awful lot.

(Laughter.)

And the thing is, I want you guys to think about this because we've been at this. And I want to take some of my colleagues because I'm going to get into this. There is no time pressures. Time isn't in it. But you know what? We can chase this rabbit around and around and around. At some point, we have to take the decision.

Ms. Naylor: Brad, this is Jenny with OGC.

And my recommendation is for the Work Group to develop a letter to the Secretary that is fully formed with the scientific bases, explaining why a certain dose cannot be reconstructed; and also, a justification, the rationale in support of --

Member Clawson: Jenny, why would we do that when we haven't even voted yet?

Ms. Naylor: Well, that's for the Board to consider what is the full rationale and, also, the Class Definition. And during this period of time, the DFO can also work with DOL to make sure that that Class Definition is something that they can administer. So, you can help streamline the entire process, come the February Board meeting.

Member Lockey: This is Jim Lockey.

I agree with Brad. I think the Board has to vote on it, and then, a little time can be taken to define the Class. But I agree with Brad; I want to get, we want to get this done. There may be a few other questions, but we don't want to spend more than a couple of months on this. And so --

Member Clawson: We've already made a strawman poll. If they need more justification than that, you know -- we based that on Hanford. We based it on everything else. We put a lot of work into it. But that was just a strawman. It was just so that we could look at what we were looking at.

Jenny, I think we're really putting the cart before the horse. But you know what? We'll do what we need to be able to do and go from there.

Member Beach: Well, it seems to me, if I recall past SEC votes, we vote, and then, the next day we pass

around a definition. I'm kind of wondering why we're having to establish all this stuff pre-vote.

Ms. Naylor: This is Jenny with OGC again.

The reason why you actually have a letter the next day to be able to vote on is because we worked on it in advance of the meeting in anticipation. And so, there is actually quite a bit of background work. And because you currently don't have a Chair, that's why I was asking Brad, who was the champion of this SEC Class, to do some work prior to the meeting itself as a preparation.

Member Beach: Okay. That makes sense.

Member Clawson: And we can work on that, Jenny, but, also, too, if you remember, the other reason why that letter was able to be sent around, too, is because there was kind of a consensus between the Board and NIOSH on which way we were going with it. And it's been kind of made apparent to me that we don't have that. So, that's kind of an interesting twist to have into it, too. We'll work on that, Jenny.

Member Ziemer: Keep in mind we can't forward it to the Secretary until we have that letter, anyway. So, even if we voted favorably today, we couldn't do anything until we had the letter next time.

Dr. Roberts: Right.

Member Ziemer: So, we're going to end up at the February meeting either way.

Dr. Roberts: Right. Right.

Okay. Well, my apologies, but I do need to go ahead and adjourn this meeting.

It seems like there needs to be some more work on

the SEC Class Definition and putting together the draft letter in the interim. And then, we will bring this on the agenda again in February.

Member Beach: I'll second that.

Dr. Roberts: Okay.

Member Kotelchuck: Okay.

Dr. Roberts: Great. Well, thank you very much, and thank you for your engagement through this two-day meeting.

Happy holidays to you, if I don't speak with you.

(Whereupon, the above-entitled matter went off the record at 5:35 p.m.)