CENTERS FOR DISEASE CONTROL AND PREVENTION

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

ADVISORY BOARD ON RADIATION AND WORKER HEALTH (ABRWH)

SUBCOMMITTEE FOR PROCEDURE REVIEWS (SPR)

FRIDAY, JUNE 5, 2026

The meeting convened at 11 a.m., EDT

M. Josie Beach, Chair, presiding.

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Members Present:

Josie M. Beach, Chair

Arthur Frank, Member

Loretta Valerio, Member

Paul Ziemer, Member

Registered and/or Public Comment Participants:

Rashaun Roberts, Designated Federal Officer (DFO)

Nancy Adams, NIOSH Contractor

Bob Barton, SC&A

Kathy Behling, SC&A

Ron Buchanan, SC&A

John Cardarelli, NIOSH

Madeline Cook, NIOSH

Rose Gogliotti, SC&A

Malia Holzberger, Department of Health and Human Services (HHS), Office of General Counsel (OGC)

Lara Hughes, NIOSH

Alek Kranbuhl, NIOSH

Lori Marion-Moss, NIOSH

Amy Mangel, SC&A

Steve Ostrow, SC&A

Scott Siebert, Oak Ridge Associated Universities Team (ORAUT)

Brant Ulsh, NIOSH

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PROCEEDINGS

(11:00 a.m. EDT)

WELCOME AND ROLL CALL

DR. ROBERTS: This is the meeting of the subcommittee of procedures review. I'm Rashaun Roberts. I'm the designated federal officer for the Board. There's an agenda for today's meeting. It's on the NIOSH website for this program under scheduled meetings, and it's under the 2026 tab for June.

Since the subcommittee will be discussing a number of different documents, some of which may involve specific sites, we do need to address conflict of interest. And if a conflict does happen to come up during the course of the meeting, subcommittee members and others do need to recuse themselves from the discussion where that conflict applies. And so, as we move through the roll call, subcommittee members and others, please state where you -- what your conflicts of interest are.

And I can hear some interference on the line. So, if everyone can make sure that they're muted before I start roll call, that would be great. Thank you.

Okay. So, let's start with Beach.

CHAIR BEACH: I'm here, and I'm conflicted at Hanford.

DR. ROBERTS: Okay. Frazier Bronson is also a member of the subcommittee that but I (audio interruption) --

(Whereupon, music plays over the audio.)

DR. ROBERTS: Somebody has put this call on hold. Yeah. Okay.

Great. I don't hear it anymore. Okay.

I was saying that Frazier Bronson is a member of the subcommittee, but he was unable to attend today due to some travel. So, Frank?

MEMBER FRANK: Frank is here and conflicted at Pantex.

DR. ROBERTS: Okay. Valerio?

MEMBER VALERIO: I'm here. I'm conflicted all sites in New Mexico.

DR. ROBERTS: And Ziemer?

MEMBER ZIEMER: I'm here. I'm -- can you hear me? Let me ask that first.

DR. ROBERTS: Yes.

MEMBER ZIEMER: I'm conflicted. At Oak Ridge X-10.

DR. ROBERTS: Okay. Thank you. Despite Frazier's absence, we do have a quorum, so we can proceed with this meeting. So, let me ask, who's here for NIOSH, DCAS, ORAUT?

MS. MARION-MOSS: This is Lori Marion-Moss. I'm conflicted at Mound.

DR. ROBERTS: Okay. Is there anyone else here for NIOSH, DCAS, ORAUT? MR. KRANBUHL: Yes, this is Alek Kranbuhl --

DR. HUGHES: This is Lara -- sorry.

DR. ROBERTS: I'm sorry?

MR. KRANBUHL: I am not conflicted.

DR. ROBERTS: Okay.

DR. HUGHES: This is Lara Hughes. No conflicts.

DR. ROBERTS: Okay.

MS. COOK: This is Madeline Cook, no conflicts.

DR. ROBERTS: Okay. Anyone else for DCAS or ORAUT? So, let's move on to SC&A.

UNIDENTIFIED SPEAKER: Scott's in the process of joining right now.

MS. BEHLING: This is Kathy Behling, no conflicts.

DR. BUCHANAN: This is Ron Buchanan, conflicted at Los Alamos.

MS. GOGLIOTTI: Rose Gogliotti, no conflicts.

MS. MANGEL: Amy Mangel, conflicted at Pacific Northwest National Lab.

DR. OSTROW: Steve Ostrow, no conflicts.

DR. ROBERTS: Anyone else for SC&A?

(Whereupon, there was an audio interruption.)

DR. ROBERTS: Let's go on to HHS and contractors.

MS. HOLZBERGER: Malia Holzberger, HHS, OGC, no conflicts.

DR. ROBERTS: Anyone from the departments, DOL or DOE? Okay. And last but not least, are there any members of the public that would like to register their attendance?

Okay. Hearing none, I just want to thank you for -- for registering attendance. And again, welcome to you all. I do need to go over a couple of items before I give the floor over to Josie Beach, who chairs the subcommittee. Since we are receiving audio via telephone only, I'm going to need everyone that's speaking -- just so that everyone can be clearly understood to ask that everyone please mute their phones while others are speaking. If you don't have a mute button, press star 6 to mute. If you need to take yourself off, press star 6 again. And because we are not necessarily able to see each other, please identify yourself by name before

questions and comments.

Again, the agenda, the presentations and background documents that are relevant to today's meeting can be found on the website. And these materials were sent to Board members and staff prior to the meeting.

So with that, I'll go ahead and turn it over to you, Josie.

MS. MARION-MOSS: Excuse me, Rashaun?

DR. ROBERTS: Yes.

MS. MARION-MOSS: This is Lori. We have some NIOSH people who were not aware that they would need to use the telephone.

DR. ROBERTS: Okay.

MS. MARION-MOSS: So, we have a few more announcements.

DR. ROBERTS: Okay. Are they on?

MS. MARION-MOSS: At least one of them is.

DR. ULSH: Brant Ulsh with NIOSH. I apologize for that. I'm the big dummy. I do now recall getting that message to use the dial in number, but I totally blew it. So, I'm here now. Sorry.

DR. ROBERTS: Okay. And Brant --

(Whereupon, music plays over the audio.)

DR. ROBERTS: -- it (indiscernible).

DR. ULSH: Yeah, (indiscernible).

DR. ROBERTS: -- it sounds like other people are joining, so maybe that will go off.

DR. ULSH: Yeah, I'm hearing music. I don't know if everyone else is.

CHAIR BEACH: Yeah, (indiscernible) put us on hold again.

DR. ROBERTS: Hi, Zaida, is there a way to get rid of that

(indiscernible). Yeah, if -- just in addition, if people would not put their -- put their audio on hold, that's creating a disruption and we're -- the rest of us are hearing music. So, that's an additional thing. Please don't put yourself on hold inadvertently, just mute.

Okay. So is there anyone else -- I think, Brant, I might have been in the midst of asking if you have conflicts and to state those.

DR. ULSH: Oh, I'm sorry. My conflicts are Fernald and Argonne East.

DR. ROBERTS: Okay. Anyone else from DCAS that's joined?

MS. ADAMS: Rashaun, it's Nancy Adams --

DR. ULSH: I don't --

MS. ADAMS: -- NIOSH contractor.

DR. ULSH: And I am telling John Cardarelli to undo the same mistake that I made, so he'll be joining momentarily.

MR. BARTON: Hi, Rashaun, this is Bob Barton. Can you hear me?

DR. ROBERTS: Yes.

MR. BARTON: Okay, great. I have no conflicts, and I made the same mistake as my compatriots over at DCAS, so.

DR. ROBERTS: Okay.

MR. BARTON: Sorry about that.

DR. ROBERTS: Okay. Is there anyone else that you know of from SC&A that is joining now or plans to join?

MR. BARTON: I missed the original roll call, so I'm not sure if Kathy is on the line, she might know if we're waiting on anyone to join -- join up.

MS. BEHLING: Yeah, this is Kathy. We have accounted for all of the SC&A people at this point. Yes.

DR. ROBERTS: Okay. Great, great. All right. And we'll give John a couple of minutes to join. And if not, if he's not on, we'll just go into the agenda. Okay. I can hear typing. And, again, if people could put themselves on mute and, again, please don't put us on hold.

DR. CARDARELLI: Hi, this is John Cardarelli. Sorry for the delay.

DR. ROBERTS: Okay. And please state your conflict.

DR. CARDARELLI: I'm only conflicted at Fernald.

DR. ROBERTS: Okay. Great. Okay. Josie, are you ready? I think we've got the roll call finished at this point.

CHAIR BEACH: Yes. I'm ready. Thanks, Rashaun. Before I get started, any additions or changes to the agenda as it's posted? Any order changes that it -- people need to make?

(Whereupon, multiple people spoke simultaneously.)

MS. BEHLING: So, this is Kathy. I don't --

CHAIR BEACH: Yeah, Kathy.

MS. BEHLING: -- (indiscernible). Yeah, well, I don't think so. But to get through the agenda, we may move things around depending on the time frame.

CHAIR BEACH: Okay.

MS. BEHLING: -- I think follow it as it is.

CHAIR BEACH: Okay. And we'll just do the same thing we normally do. We'll go a couple hours and take a half-hour comfort lunch break, if that is agreeable with everybody. Hopefully we'll get through the agenda. So, with that, I'm going to just go ahead and let Kathy -- you're going to get started with the approved documents, correct?

Document Reviews Approved by the Subcommittee for Procedure Reviews

MS. BEHLING: Yes. That's correct. Let's see if I can share my screen. We'll start there. This is the handout that is -- that was sent out, and it is part of the -- it's on the website. It's "Document Reviews Approved by the Subcommittee for Procedures Review." We are -- let me see here. Pull this up. Thought I had it. No, that's the agenda. Let me see. No. Okay. Hold on one second.

Okay. Let me get back here. Let's see if I can share this. I assume you're not seeing that.

CHAIR BEACH: No, we're not.

MS. BEHLING: Now?

CHAIR BEACH: No. Sorry.

MS. BEHLING: Okay.

CHAIR BEACH: The toughest part of the meeting getting our --

MS. BEHLING: Yes, isn't it? I apologize. Okay. Let's see here. Share. Okay. Maybe now?

UNIDENTIFIED SPEAKER: There you go.

CHAIR BEACH: It's up.

ADMINISTRATIVE ITEMS

SPR-approved Documents for August Board Meeting

MS. BEHLING: (Indiscernible.) It always seems -- I don't know. It seems to change every time I -- I try to load these. Okay.

We are -- we only have a few documents left, really, from this list that have not been presented to the -- to the Board. The first, I'm suggesting five documents from this particular list. However, because we have an hour and a half for our meeting, we may be able to add one from the result of hopefully closing out a few items on our agenda today.

So, the first document that I'm suggesting is this OCAS-TIB-11, which you can see had two findings. It's the lung dose conversion factors for thorium working-level month. I'm going to go down now to -- see if I can go down to Page -- here we go -- Page 6 of this handout. And at the bottom of Page 6 is report -- Report 97. Now, this particular report -- actually, Bob Barton had presented this "Breathing Zone to -- General Air Concentration Ratios in Small Workrooms" to the Board back, I think, two years ago, 2004 (sic). But that was presented in behalf of one of the work groups, and we didn't have any NIOSH responses. So, I felt we should formally close this out by presenting again and getting NIOSH's responses to the two observations. So, that's the second one on the list.

The next two are OTIB-93. There is no findings there, but we still need to present. And Report-84 again, no findings, but we can just give an overview of the review that we have done. And then finally, -- we always have to add a PER in there -- and PER-93, which is Texas City Chemicals, there's two lines for that because we do the Subtask 1 through 3 Report, which is down here, and also the Subtask 4 Report. I thought we could present that PER too at -- at the August Board meeting.

And as I said, perhaps after today's completion of our agenda, perhaps OTIB-92 or Report-71, I think we're going to be closing those out today.

CHAIR BEACH: Okay. Yeah, I -- I'm fine with adding those. You're the one that makes the slide screens up, and all of these seem like they're going to be fairly quick. Other subcommittee members?

MEMBER ZIEMER: This is Ziemer. I have no problem adding them.

CHAIR BEACH: Okay.

MEMBER VALERIO: This is Josie. This is Josie. I'm sorry, this is Loretta, Josie. I'm good.

CHAIR BEACH: Okay. Thanks, Loretta.

MEMBER VALERIO: Sorry about that.

MEMBER FRANK: Arthur Frank. No problem.

CHAIR BEACH: Okay. That sounds good, Kathy.

MS. BEHLING: Okay. And Josie, I'll just make mention, on this list, you're gonna see there are documents that say -- that were being proposed for the April Board meeting. Because we now have to get all these documents that are going to be PA cleared and put onto the website to our production very early, it -- I did not have an opportunity to change those, but everything that -- obviously, that we had suggested for the April Board meeting has been now presented and closed by the Advisory Board just for --

CHAIR BEACH: Understand that. Yeah, thanks for clarifying that. But yeah, I -- I figured that when I reviewed it.

MS. BEHLING: Yeah. Okay, though.

CHAIR BEACH: Okay. That's great.

2025 Program Evaluation Report Protocol Revision Proposal

MS. BEHLING: Okay. So, next one -- all right. The next item on the

agenda -- and let's see if I can pull this up.

CHAIR BEACH: Is the PER protocol presentation. We've discussed this a few times. So, this is the formal...?

MS. BEHLING: Yeah. This is more of a formal...

CHAIR BEACH: Yeah.

MS. BEHLING: Let me ask, are you seeing my screen?

CHAIR BEACH: No. Just the -- just what you had before.

MS. BEHLING: Okay. Let's see if we can figure this out. Okay. Here. Okay. Are you seeing that?

CHAIR BEACH: Yes.

MS. BEHLING: Okay. Good. And is it a full screen? I always get confused with this.

CHAIR BEACH: Yes, it is.

SC&A Revised Program Evaluation Report (PER) Protocol Presentation

MS. BEHLING: It is. Okay. Very good. Okay. Yeah, we -- we have discussed this, and I'm going to go through the process. And I'll -- bottom line is we're just formalizing what we have been doing, but I'm going to give you a little bit of a background and -- and history on this. So, I'm going to start with just the evolution of -- of this whole PER process, and we're going to go way back to the beginning when SC&A started being part of this project. That was back in 2004.

And they have heard this before, but initially we were tasked to do a set of -- of technical document reviews. And the first set that was tasked

was in 2004, and it included 33 documents, two of which were PERs. And then in December 2006, SC&A was tasked to review a second set of 45 documents, and that included four PERs. I mentioned that because those six PERs were actually reviewed under our protocol for reviewing NIOSH procedures and methods. And then in June of 2007, the designated federal official actually requested that we submit a separate propose -- proposal for the review of PERs. And in -- we did that, and in July of 2007, the Board approved SC&A's protocol, which at that time included six subtasks.

Okay. Then in November of 2007, the Board tasked SC&A with the review of PER-9, which is targeted organs for lymphoma. And SC&A issued its first report, which included Subtask 1 through 3 reviews of PER-9. And after submitting that review, the contract evaluation panel recommended that we eliminate the first subtask, which initially was to assess the circumstances that lead -- that led to the identify -- to identifying the issue which prompted the PER. And so, in December of 2009, SC&A issued Rev. 1 of our PER protocol, and we removed this initial Subtask 1 and expanded a bit on the other five subtasks.

So, for Subtask 1, we assess NIOSH evaluation of the issue. And we included this subtask so that we could ensure that the issue was fully understood and characterized in the PER. And for Subtask 2, this is where we're assessing NIOSH's method for corrective action. And when -- if there is a corrective action that uses a document, a technical document that was not previously reviewed by SC&A, that evaluation has been performed, and it's performed under Subtask 2. And this level of review just ensures that the scientific credibility of the of the correct -- of the corrective action.

Okay. And under Subtask 3, we evaluate the approach used for identifying the universe of -- of potentially affected dose reconstructions, and we assess NIOSH's criteria by which a subset of potentially affected dose reconstructions was selected for re-evaluation. And here we will also evaluate and give consideration to the time to effect the PER.

For Subtask 4, we thought it would be beneficial to review a sample set of dose reconstructions that will be worked under the PER. The number of case reviews will vary based on the PER, and they are selected by the Board. And then finally, our Subtask 5 was to prepare a comprehensive written -- written report of these subtasks.

So, prior to completion of PER-9, SC&A was tasked with reviewing OCAS-PER-12, which is "Evaluation of Highly Insoluble Plutonium Compounds." And this review really became the test case for completion of all of the SC&A protocol subtasks. And in completing this -- this review, it was determined that the best approach was to complete a Subtask 1 through 3 review and then conclude -- how to -- write a report. But that report also includes a section that suggests the selection criteria for the case reviews under Subtask 4.

So, in March of 2010, we submitted our PER-12 Subtask 1 through 3 Report, and then in July of 2012, we submitted our Subtask 4 Report, which included the case reviews. And at the July 31, 2012, meeting, the subcommittee approved the review of the PER, and they agreed with the revised protocol. So, throughout the years, previous and current (indiscernible) versions of the -- the subcommittee on procedure reviews recommended that NIOSH -- that SC&A should modify their protocols to

update what was actually being done in practice.

And so, during the 2024 contracts rebid, we reviewed the protocols, and we did come to the subcommittee in -- at the November 2024 meeting and requested and obtained approval to suggest modifications to the -- to the PER protocol. And then we submitted those -- that revised report. Actually, I wrote it as a new report, Task 3, a protocol to review NIOSH's program evaluation report. And I'll just say the reason I didn't make it a revision, I wrote it as a new report, is because there were a lot of -- there was a lot of extraneous information in that initial procedure because it included a lot of discussions on our PER-12 approach. It included tables, PERs that still needed to be reviewed. And so, it was not data that was relevant anymore. And because it was such a significant change, I made it a separate document.

So, under our proposed revision, Subtask 1 did not change. And effectively, we just tweaked the language in Subtask 2 through 4. Subtask 2, again, if basis is supported by documents that we haven't reviewed yet, we do -- do an evaluation of that report under Subtask 2. And if we had already reviewed that -- the documentation, then we just provide a summary and conclusion of that review.

For Subtask 3, SC&A evaluates the approach for identifying the universe of potentially affected DRs, and that includes assessing the criteria by which the subset of potentially effective DRs was selected for reevaluation. We also evaluate the time to effect the PERs, and then a written report is submitted to the subcommittee for -- of our one -- Subtask 1 through 3 findings. And as I mentioned, this report also includes

suggested case selection criteria for the Subtask 4 report.

Under Subtask 4, we review a few cases that were affected by changes described in the PER, and this audit typically -- it includes and is limited to, reviewing only those methods and corrective actions introduced in the revised doses. However, we do provide a summary table with -- where we present all of the estimated doses for all of the pathways, and if we find information that appears to be something that would be interested -- that the subcommittee would be interested in, or some inconsistency, we may expand on that as deemed appropriate during the review. And then finally, we present the subcommittee with a comprehensive report of the case review findings.

So, in summary, this is an approach that SC&A has been following since the approval of PER-12 back in 2010 through 2012 time frame. And this revised protocol simply formalizes that approach. So, do you have any questions?

CHAIR BEACH: Thank you. Kathy. Appreciate you doing the work to -- to formalize this for us. And really, the only thing that changed was we got rid of five -- yeah -- which --

MS. BEHLING: Yes. I haven't --

CHAIR BEACH: -- we haven't used before, so.

MS. BEHLING: Yeah, I made a big presentation out of elimination of just one subtask. There was some modifications.

CHAIR BEACH: No, it's okay. Yep.

And Brant, I see your hand up, but subcommittee members, any questions or comments on this?

MEMBER ZIEMER: This is Ziemer. I have no questions or comments. Good job, Kathy.

MS. BEHLING: Thank you.

CHAIR BEACH: Thanks. Thanks, Paul.

MEMBER VALERIO: This is Loretta. No questions or comments.

CHAIR BEACH: Arthur, anything from you? Any...?

All right. Hearing none, Brant, go ahead with the question.

DR. ULSH: Yeah. Thank you, Josie. I actually have two questions, but I'll do them one at a time. Kathy, can you go back to Subtask 2?

So, I'd like to home in on the phrase in there, (reading): ...ensure the credibility of the corrective actions and its consistency with current consensus (sic) science. Can you clarify what that means?

MS. BEHLING: Well, I -- I'm not sure I can clarify it more than is stated there. What we're trying to do is just look at documents that are being used for corrective action. And if we haven't -- if the Board hasn't had a review of that document, we just want to ensure that we do a review and that it is consistent with current science. I don't know if that answers.

DR. ULSH: It's the current -- it's the consensus science part that I think is throwing me for a loop. If it's just -- if you guys are evaluating these PERs against our program documentation, that's not a problem. That's what I expected. But if you're evaluating it against, you know, the science on radiation biology and radiation epidemiology and stuff outside the program, which is what I kind of interpreted consensus science to mean, so I think maybe I'm interpreting that differently than you are, I hope. I don't know.

MS. BEHLING: I think you are, and perhaps the words that were put together, like I said, many years ago when I made these revisions, I attempted to keep things as consistent as they were in the previous revision. But I agree with what you're saying, and I think we should modify that wording, because what we're trying to do is compare this to NIOSH the program and ensure that we review all of the documents that NIOSH is using in behalf of this PER. So, I think that wording could be applied, and I agree.

DR. ULSH: Yeah, your -- your verbal description is exactly what I expected. The words on the slide are maybe a little different than I expected.

So, my second comment is on Subtask 3, which I think is the next slide. Yeah. The -- where is it? (Reading): SC&A will also evaluate and give due consideration to the time to effect the PER. I think in the -- in the actual document, you said evaluate the timeliness of the completion of the PER.

MS. BEHLING: Right.

DR. ULSH: I -- I did not know that that was part of your reviews. I have concerns about that because our workflow priorities in terms of how much priority we give to PERs compared to other things like SEC evaluations and dose reconstructions and responding to the Board, those are really kind of in our purview, and I don't know that they are subject to review by SC&A, but I'd be curious to hear what you mean by that.

MS. BEHLING: Okay.

MR. BARTON: This is Bob. Can you --

MS. BEHLING: But --

MR. BARTON: -- hear me, all?

DR. ULSH: Yes.

CHAIR BEACH: Yes.

MR. BARTON: Okay. Great. On the first comment on Subtask 2, I mean, this is sort of -- I mean, this is the entire program. I mean, if you guys make a big change in your dose reconstruction methodology, that requires a PER, then the Board wants to know about what that change was and, you know, the validity of it. And frankly, I -- I don't think that there has really been any kerfuffle over that. It's just let's report the information so that it's made public and the Board knows.

On the Subtask 3 about due -- due consideration to the time to effect, again, that's just reporting the information. It's not a judgment or anything like that on -- and we understand that there are certainly programmatic concerns about, you know, what's on the front burner, what's on the back burner. We understand that. Again, this is just to give an overview to -- to provide the information to the Board and the public as to what's going on. So, I -- I think there might be a bit of defensiveness going on right now about whether we're trying to attack the program; we're not. We're not at all. We're just providing an expansive look at what's going on. Anyway...

DR. ULSH: Well, no, I -- I --

CHAIR BEACH: Thanks.

DR. ULSH: -- can agree with that. On the credibility issue, I think if we make a change to one of our technical documents and SC&A evaluates those technical documents, that's the place for if we're going off the rails in terms of we're doing something totally contrary to science, that's the place

to raise that issue. The PER is how we go back and reevaluate doses, assuming that the changes that we made to the technical document are in place. Did we identify the right claims? Did we change them in a way that agrees with the way that we change the technical document? That's really all the PER is. But evaluating the science that occurs isn't in your reviews of the technical document.

Now, in terms of the timing --

MR. BARTON: I agree completely with that. I -- I agree completely, but what we're saying is that if the Board and SC&A hasn't actually looked at the technical document, we don't have a review of it, then this is a forum where we can actually take a look at it. And essentially, it's -- it's a TBD review. You know, and so, -- so, I think we're saying the same things, Brant.

DR. ULSH: Okay.

MR. BARTON: Yes, it is --

UNIDENTIFIED SPEAKER: Excuse me, Bob.

MR. BARTON: -- under the guise of a TBD review, and we can call it that if it -- if it helps, but – but also the PER process sort of allows for that to occur. So, I -- I think we're talking about the same thing. And we're not, you know, like, trying to double down on -- on a TBD review and a PER review and all that, the same thing. But we're -- we're -- what we're saying is if there's a change, and a lot of times there's a change that maybe isn't an official TBD either. It could be, you know, these DR documents that are unreviewed and unknown to the Board, and so we're just trying to say we're going to take a look at that information and see what the Board wants to do

with it. We're not trying to relitigate everything.

DR. ULSH: Okay.

MR. BARTON: But if there is a change, then it should be public and look -- looked at. That's all.

DR. ULSH: Okay.

MR. BARTON: I think that's all we're trying to say here.

DR. ULSH: Okay. Well, I'm not --

MS. MARION-MOSS: Yeah. This is Lori. Can you hear me?

DR. ULSH: Yep, we can hear you, Lori.

CHAIR BEACH: Go ahead, Lori.

MS. MARION-MOSS: Yeah, Bob we're -- we're not being defensive here. I think it's the wording that has been used in the protocol specifically for Subtask 2, "consensus." And Kathy has agreed that she would clarify that with an update. But we just clearly here want to find out what some of these phrases meant. And we wanted SC&A's interpretation of that so we could have the correct interpretation.

Under Subtask 3, we're saying give due consideration to the time, and that's what gave us some pause there. Are we talking about how long it takes us to generate a PER or what? That's specifically what we were honing in on, and we just clearly needed clarification on what that meant.

MS. BEHLING: And this is Kathy again. If I can expand a little bit on that Subtask 3. Back when we started writing both the procedure protocols for -- for review and for the PERs, we got our inspiration from going into 42 CFR 82 and the final rule and reading through that. And timeliness issue came up a lot of times, and I will say, when we wrote our initial procedures

review protocol back in 2004, we had seven objectives. And one of those objectives -- objectives did have to do with timeliness just because of it being mentioned so often throughout the regulations.

Now, my feeling for the PER is, yes, this is probably one of the few times that the Board has an opportunity to see, okay, the change in a procedure or in an OTIB or a technical basis document happened at this time period. And so many months later, a PER was generated, which does have an impact, obviously, on -- it increases dose and it can change the outcome of the POC. And so, it gives the Board an understanding of that time frame. And that's the only reason that we had included it in there. Does the Board need to see that, do they want to see that; we thought they made because of what is in the regulations. But that's up to the Board. That -- that is something that can be taken out also, but I'm going to let the subcommittee make that decision.

(Whereupon, multiple unidentified speakers spoke simultaneously.)

DR. OSTROW: This is Steve Ostrow. I just want to make a -- reinforce this a little bit about Subtask 2, practical things. Okay. I've been doing PERs the last couple of meetings, and I'm doing extrusion plant this afternoon. The PER was occasioned by changing from Rev. 0 to Rev. 1 of the TBD, extrusion plant. Well, we never reviewed the TBD to begin with, so we had to perform a focused review of the TBD just to put things into context. We can't evaluate the PER without looking at the TBD changes. So, we call that, I guess, a focused TBD review. And I think that's what we meant by doing a -- you know, a T -- a technical review to support the PER. I hope that clarified a little bit.

MS. MARION-MOSS: Yeah. For me, Steve, this is Lori, that -- that's what we expect. Exactly. So, that's clear to me.

CHAIR BEACH: Yeah. Thank you. This is Josie. We've been operating this way for many, many years. And the only thing really that's changed -- the wording hasn't changed on any of these, except for Subtask 3. So, we're going back to something that was agreed upon. And I'm okay with changing the wording to make it more clear, but I don't want to take anything out, especially on Subtask 3. I think it's important -- and other subcommittee members can chime in -- that we -- the time and we may not do anything about it, but it's -- it -- we need to know what's happening there.

Paul, have -- you've been around since this was -- came out, any comments or thoughts?

MEMBER ZIEMER: Yeah, this is Ziemer. I -- I think what Lori was saying clarifies it. There's -- there's simply the opportunity to make sure that we've taken a look at anything that's -- might have affected the dose reconstruction, but I -- I don't have problems with the Subtask 3 at all.

CHAIR BEACH: Okay. Thank you.

MEMBER ZIEMER: If you can -- if you feel like you want to reword it, if it's not clear, but -- what -- what would -- what would -- what would be the alternate wording if you wanted to clarify it some other way? I'm not sure what -- what would be different here.

MS. MARION-MOSS: This is Lori. Yeah, I don't think there's a difference. I think I'm clear on what you mean by that point. And we just wanted to hear that from as SC&A.

Brant, if you have any further questions, speak.

DR. ULSH: Well, yes, on the on the timeliness issue in Subtask 3, I can envision a scenario where SC&A reviews the PER, and they report that this -- the change in the guiding document was made three years ago, and the PER took three years. Okay. That's fine, but if there was a finding or an observation against that, like it took too long, I think we would strongly resist that because, you know, we have other priorities. And I can -- I can already give you the headline. Now we are very far behind on PERs because we have higher priorities to attend to.

MS. BEHLING: This is Kathy.

UNIDENTIFIED SPEAKER: (Indiscernible) --

MS. BEHLING: I'm sorry.

MEMBER ZIEMER: Yeah, and Brant is correct on that. That's sort of an operational issue versus the intent of -- of the subtask, I think. I -- I don't know, what -- what -- what do you feel, Brant, is that it's a practical issue right now, right?

DR. ULSH: Yeah. It's just -- like I said, I don't -- I don't have any problem with, with telling the Board how long it took us to do it. If there is a judgment attached to that, like a finding or an observation, then I think we would have an issue. And if that's not the intent, then -- then that's great; no problem.

MEMBER ZIEMER: Thank you.

MS. BEHLING: I -- this is Kathy. And I can tell you that is not the intent. It is just an informational issue that we're trying to present to the Board and to the subcommittee. And I agree with you in the fact that I used

to work with David Allen on these. And David and I would talk about, are you issuing a PER because of this, and he would sometimes explain to me, we have something else in the works, and we're going to make another revision to this particular procedure or a technical basis document. And so, we're going to hold off on giving the PER because it'll be covered under both. And I -- that's certainly understandable and explainable. It's just that this is, as I said, the one area where we can at least point out to the subcommittee what the time difference was, and that was our only intent.

DR. ULSH: Okay. That's -- thanks, --

MR. BARTON: And -- and --

DR. ULSH: -- Kathy.

MR. BARTON: -- Kathy, if I could add to that. I mean, there are certainly very reasonable situations where things might be delayed. There was the -- in a previous meeting, I believe, the term from hell was used because it was about ICRP changes which would affect across the Board. It was going to be a nightmare to update everything. And so, that was going to take a long time. So, that's a situation where timeliness is explained. And, again, I -- I feel confident that SC&A will reflect that kind of situation accurately. So, again, this is not supposed to be a -- a -- somewhere where there would be a finding. And in fact, any PER I've seen almost has a boilerplate line in there that, you know, the PER was done in a reasonable time frame. I -- I don't think there's ever been, at -- at least to my knowledge, an instance where we brought up an issue of a PER being late of --

MS. BEHLING: No.

MR. BARTON: -- justifiable or unjustifiable reasons. So, just to add that.

MS. MARION-MOSS: This is Lori. (Audio break) with you wholeheartedly, Bob. So, I think our concern and clarification has been met. Thank you.

MR. BARTON: You are most welcome. It's a pleasure.

CHAIR BEACH: All right. Thank you. Good --

MS. BEHLING: Okay.

CHAIR BEACH: -- discussion. Go ahead, Kathy.

MS. BEHLING: Yeah. If the subcommittee is okay with what I presented here, I will make some modifications. I will try to often clarify the first bullet under Subtask 2. We will take out some wording here and -- and pass that by you again. This -- and I will also need to include in there if this is approved today that -- so, I'm going to have to make another modification or just a slight modification to this to say that this was approved at this particular subcommittee, if that's what happens. But I'll hold off until you all make your judgment.

CHAIR BEACH: Okay. So, I'm -- I'm questioning if we need to make any wording changes. It sounds like NIOSH understands the wording. Am I hearing that clear, or do we need to make the changes? And I'm asking Lori or Brant.

MS. MARION-MOSS: This is Lori. I see here on your Subtask 2, I believe, in the report that was submitted prior to this meeting, the word "consensus" was added in there, but I don't see it here on your presentation. So, I believe as it's written here, it's -- it's acceptable to us.

MS. BEHLING: Okay. I thought --

CHAIR BEACH: Okay.

MS. BEHLING: -- if I -- if I used the word consensus in the actual protocol, I will change that.

(Whereupon, multiple speakers speak simultaneously.)

MR. BARTON: Yeah, you do -- you have a valid point there, because there's never a consensus in the scientific community. So, acceptable science sounds right to me.

DR. ULSH: There you go.

CHAIR BEACH: Okay. So, moving forward, subcommittee --

I don't think we have to vote on this, do we, Rashaun? Accept or don't?

DR. ROBERTS: No, I -- I don't believe so.

CHAIR BEACH: Okay. So, Paul, Arthur, Loretta, everybody in agreement? I believe you all are. I haven't heard from Arthur -- Arthur.

UNIDENTIFIED SPEAKER: I think you're --

MEMBER FRANK: -- is not a problem for me.

MEMBER ZIEMER: Yeah, I agree. I give consensus on it. Yeah.

(Whereupon, there was an audio interruption.)

DR. ROBERTS: Okay. If someone's off mute, would you please mute your -- thank you.

MEMBER VALERIO: This is Loretta, Josie. I agree.

CHAIR BEACH: Okay. So, it sounds like we're all in agreement. I think, Paul and Arthur, you guys were talking over each other, and I...

MEMBER ZIEMER: This is Paul. I think we've heard consensus here.

Let's go ahead and do it.

(Whereupon, there was a continuing audio interruption.)

CHAIR BEACH: Okay, great. And somebody's off mute. A.M. Okay. Back on mute. Okay.

So, Kathy, I think we're good.

MS. BEHLING: Okay.

CHAIR BEACH: I think we can go ahead and formally close this and --

List of Documents Awaiting NIOSH's Response

MS. BEHLING: Very good. Okay. Ooh, ooh, don't want to do that.

All right. I think the next thing on the agenda, and this is a handout that I provided to the subcommittee, and this is the list of documents awaiting NIOSH's response. And we started this list the last time, and I have updated it for this meeting. I -- it's not PA cleared, so I'm not going to show it. I'll just give you an overview. This time around, the total number of documents that we're waiting for responses for are -- we've list -- we listed 66. In December of -- when I did the previous listing, there were 58. Total number of findings, 147, and that's up from 145. Total number of observations, 134. There were 107 back in December. And the open items stayed the same at 23; in progress, 171, previously it was 145. And in abeyance is 82, compared to 79 in December. And 5 were transferred. So, this just provides the subcommittee with an understanding of what we're still waiting for. I don't know if you have any other comments.

CHAIR BEACH: Is there --

MS. BEHLING: (Indiscernible) --

CHAIR BEACH: -- is there anything -- oh. Okay. I thought I was on mute. Is there anything that we need that we can go through with -- with NIOSH that would help? Like stuff you're waiting for? For instance, some Subtask 4 cases. I believe there's some we requested that I don't know if you have gotten them yet.

MS. BEHLING: No, I still -- Lori and I talk on a routine basis, and we -- we still are waiting on -- on some Subtask 4 cases for some PERs and also some cases for the Vallecitos. And I know Lori has indicated that she's working on this. And we've also been -- we've all talked about during our next meeting, we've been working on updating the BRS and modifying some reports and that type of thing. Some -- I don't know --

CHAIR BEACH: Yeah.

MS. BEHLING: -- I don't know if Lori wants to chime in here.

MS. MARION-MOSS: Yes. This is Lori. Yeah. We're still pulling together cases. We do want to make sure we have all the claim files associated with those cases. As you all well know, we've had to transition from one location to another. And we're just confirming that we have everything before we share them with SC&A. So, we do have some in the queue now that should be coming over to Kathy following this meeting. At least three PER reviews and a DR methodology.

CHAIR BEACH: Okay. Sounds great. It's good to know that you guys are working together on this, and I don't have any other questions on it. Any other subcommittee members have questions?

CARRY-OVER ITEMS FROM JANUARY 28, 2026, SPR MEETING

CHAIR BEACH: Okay. I think we can go ahead and move on to the carryover items next.

SC&A Memo Re: ORAUT-RPRT-0071, rev. 00 "External Dose Coworker Methodology"

SC&A Memo

MS. BEHLING: Okay. Yeah. Let me see if I can pull up -- I -- I submitted a memorandum to the subcommittee back in April, and this had to do with Report-71. Let me see if I can find this. Okay. There it is. Let's see if I can share it. Oh, boy. Let's see here. Huh-huh-huh. Are you seeing that?

CHAIR BEACH: Yes, we are.

MS. BEHLING: I don't know how I'm doing this.

(Whereupon, Ms. Behling and Chair Beach speak simultaneously.)

CHAIR BEACH: Keep it up. Keep it up.

MS. BEHLING: All right. We -- we've gone through this Report-71 before, so I'm going to attempt to be very brief. Report-71 is "External Dose Coworker Methodology," and this report introduces the multiple imputation for estimating, you know, radiation exposure. And it's used to replace the previous method of using one-half yellow D for low-dose readings. And there are going to be applying this to co-exposure models. And we had -- when we use Report-71, we had ten observations. And at the last meeting, NIOSH did have responses for these observations.

Now, rather than going through all of them, I'm just going to briefly explain what our observation was and what the NIOSH response was. But I

really -- I group NIOSH's responses for Observation 1, 2, 7, 8, and 9. And that had to do with concerns we had about uncertainty and mixture models and clustering. And they did not see lognormal and population subsets. And NIOSH generally agreed with the observation, but they also stated that Report-71 is really limited to what -- to comparing this multiple imputation with one-half to yellow D substitution for co-exposure modeling. So, a lot of these issues are really outside of the scope of those observations.

For Observation 3, we stated that this statistical distribution of sensor data should be determined on a case-by-case basis, and NIOSH concurs and says that the lognormal distribution is usually appropriate, but a statistician can and will consider other distributions if that's necessary. For observation 4, NIOSH -- we stated that NIOSH should account for relationships between dose and covariance. And NIOSH said typically, data sets do not contain information to enable them to use covariance, but if they do, the statisticians will use that.

Observation 5, SC&A felt that -- I'm sorry I should be moving the screen here. I'm talking. All right. So, Observation 5, SC&A felt that there was not adequate information to provide -- provided on how Table 1-1 doses were reconstructed in the report. And those -- that was a list of dosimetry results for a worker for a one-year time frame. And NIOSH responded that actual values for results less than a limit of detection had been recalculated based on things like number of tracks and length contraction and cycle-specific calibration. So, the raw data was not made available to them, and the imputation models do not use the recalculated values that are less than LOG.

For Observation 6, we said the report could benefit from a disclaimer in the discussion of linear imputation, and NIOSH agrees with that and says that was used for illustrative purposes, and the statisticians are aware of that. And Observation 7 stated that the report does not address the implications of positive measurement error. And NIOSH disagreed with that observation and said that measurement error exists any time a measurement is made. Sometimes you're going to have doses that are reported as less than LOD that are actually true doses and vice versa. So, this is typical in every analysis and just not addressed here.

So, in summary we -- we wanted to put something formally in writing. And -- and in summary, SC&A finds NIOSH's response to adequately -- adequately address our technical concerns provided that the statistician applying Report-71 is aware of these recommendations. And during the last meeting, that January meeting, NIOSH did affirm that the statisticians do have access to this -- to this report. And so based on that, we feel that these -- these observations can be closed. However, we would just also recommend that the subcommittee and the Board monitor how this report is being implemented at the various facilities and situations as appropriate. So, it's something that will keep our eye on when we see that Report-71 for various facilities and site profiles. But we're still --

CHAIR BEACH: Okay. So, -- thanks, Kathy. I was just going to ask how you were going to do that, but I understand those are listed, and you can go in and check, so.

MS. BEHLING: Right.

CHAIR BEACH: I don't have any questions. Comments or questions,

subcommittee?

MEMBER VALERIO: This is Loretta. No --

MEMBER ZIEMER: This is --

MEMBER VALERIO: -- questions.

MEMBER ZIEMER: Ziemer. No questions or comments.

Board Review System (BRS) Update

MS. BEHLING: Okay. Okay. If I can interject one other thing, I wrote on here on the agenda about BRS. All of these -- and I'm pleased to report that the backlog of everything that was listed in that temporary BRS that we were using when we didn't have access to the BRS, all of that data has been now entered into the BRS.

I have two more templates that need -- I have to enter the data in, and I'm waiting on -- Lori and I have talked about that. She needs to update that for me. We are also -- I was working with NIOSH and the IT people to update -- now that we have -- we can enter observations, findings, and comments. When you generate a report from the BRS, which I usually include in the Board Coordination Report, it is not accurate, and it's not reflecting information that's in the BRS. So, I put together a -- a sample of a -- of a report that they may want to consider for showing that type of information. It's much more complex now, and it almost needs two -- two separate rows for each -- for each document. But that is the -- that is being updated.

And the -- the only one thing I have to do is make one more sweep through the BRS because I've entered everything, but now I have to go back to old documents where everything was listed as a finding, but they are

actually observations. And so, I have to go in and modify that. And also where there's comments, where we put in a placeholder to say we had a finding of no findings, we have to change that to -- to a comment now and -- to make -- to reflect accuracy in the BRS and when we generate a report, it's going to show accurately what are observations, what are findings, and what our comments. So, I'm pleased to say we're making progress there.

CHAIR BEACH: Okay. And are you giving notices when things are added to the BRS when NIOSH -- would they answer some of the comments or questions? Is it -- how is that being done?

MS. BEHLING: Well, Lori and I have talked about that several times also. She is trying to update me. I will say that it becomes a little bit confusing at times. And I will say while I've been going through the bars and spending so much time there, I have taken notice that there are some NIOSH responses in there that I was not aware of, and I've made a list of those so that, I'm hoping, in a future meeting we can discuss those and -- and get rid --

MS. BEHLING: -- of them, so.

CHAIR BEACH: Uh-oh.

CHAIR BEACH: Someone's not on mute.

DR. ROBERTS: Hello?

DR. ROBERTS: Hello? Please put your phone on mute.

CHAIR BEACH: Oh, hopefully that works.

CHAIR BEACH: Nope.

DR. ROBERTS: Can we cut that line?

CHAIR BEACH: All right. Does it sound like we're clear, maybe? Can

you hear me?

DR. ROBERTS: I think you should go on. And I guess if they come back on, we'll see.

Closeout Discussion

CHAIR BEACH: That's frustrating. Okay. Thank you. Thank you, Kathy, and -- for your patience. I kind of lost track of where we were. I do want to circle back to 071 and formally we're -- the subcommittee is formally closing out all those observations. So, that's noted.

I don't think we have to vote or anything, do we, Rashaun?

DR. ROBERTS: So, we typically don't take formal --

CHAIR BEACH: Okay.

DR. ROBERTS: -- votes, just agree --

CHAIR BEACH: Okay. Thank you. I just wanted to make sure. And then back to the BRS. I had -- kind of had a question on the -- can we archive any of these that are done? When I went into the BRS, it's so cumbersome and slow to go through and start hunting down everything. Is -- is there any way to archive stuff that we're finished with but yet have it handy? I don't know if that's ever been discussed and maybe this isn't the appropriate time. I was just curious mostly.

MS. MARION-MOSS: Hi, Josie. This is Lori.

CHAIR BEACH: Hi, Lori.

MS. MARION-MOSS: I -- to answer your question, I don't know, but we can look into that and see what you're really referring to and get a clarification on what you would like to see --

CHAIR BEACH: Okay.

MS. MARION-MOSS: -- to be able to answer your question.

MS. GOGLIOTTI: This is --

CHAIR BEACH: Yeah, maybe I'll talk to Kathy about it. And whenever you guys are chatting, you can talk about it. Okay.

MS. GOGLIOTTI: This is Rose. I wonder if it might be handled -- helpful if we made, like, a search guide or a way to help optimize searches inside there, because I understand if you were looking at it in a certain way, it can be really cumbersome, but there are ways of searching to find exactly what you're looking for.

CHAIR BEACH: Right. No, and I agree with that, there is. I was just wondering about -- yeah, it -- it's a good thought. And I know you can -- you can search. And I've been out of it for a year and then back into it. It just -- it just seemed a lot. And if we could archive some of the stuff, we're finished -- anyway, I'll talk to Kathy offline.

So, and then updating -- I know Lori, you talked to Kathy about what's in -- is there a better way to find -- than Kathy just happened to go through step by step of the BRS of knowing when comments have been made or -- or added to the BRS? I know you try.

MS. MARION-MOSS: Yeah, we talked about this. This is Lori. We talked about this --

CHAIR BEACH: Oh. Okay.

MS. MARION-MOSS: -- years -- years ago and there may be, but I can't make any promises today. But in the interim, we are sending emails.

CHAIR BEACH: Okay.

MS. MARION-MOSS: And we will make improvements on doing so.

CHAIR BEACH: Okay. I know you got a lot on your plate, and we appreciate what you are doing to inform us.

Okay. Any other questions or comments on this section? Kathy, anything else you need from us on this?

MS. BEHLING: No, I don't think so. If you're --

CHAIR BEACH: Okay.

MS. BEHLING: -- all in agreement, I will update the BRS with our information that these have been closed.

CHAIR BEACH: Yes. Okay. That sounds great.

DCAS-PER-079, rev. 0 "Pinellas TBD Revision" Presentation

CHAIR BEACH: All right. I think we can move on to 79 -- PER-79. And Steve Ostrow, that's you.

DR. OSTROW: Hi, it's Steve.

CHAIR BEACH: Hi, Steve.

DR. OSTROW: Hey. Okay, let me see. Okay. As every other presenter, let me see if I can share the screen. That seems to have worked. Can everyone see the screen?

CHAIR BEACH: Yes, I can.

DR. OSTROW: Oh, wonderful. That was my big concern. All right.

So, this is the Pinellas Plant. Okay. Whoops. Next slide. Here we go. Let me make it full size. All right. So, Pinellas. Okay.

What I was just talking about before earlier, purpose of the PER-79 was to assess the impacts of Rev. 2 of the Pinellas Plant external dose TBD. This is very common with PERs. So, NIOSH changes the TBD or update --

updates it, it becomes a PER.

So, history. October 2020, NIOSH issued the PER. The March 2024 -- the subcommittee for procedure reviews tasked SC&A to review the PER, and we issued a report September 2024. And this presentation is based on the report that we had issued.

All right. Little background. Because people have been tuning in to various meetings that we've had a lot of discussions about Pinellas, but for people who hadn't -- not familiar with it, plant was constructed in 1956 by General Electric on a site near Clearwater, Florida. And Pinellas was part of the weapons complex. The main operations, it manufactured --

MR. BARTON: Steve -- Steve. I think we lost your screen.

DR. OSTROW: You lost my screen? Oh, no. Okay. Hang on. I'll go --

MR. BARTON: -- it's hiding.

MS. BEHLING: Yeah, we're not seeing your presentation. I had my hand up.

DR. OSTROW: Let me go see. We shall try again. How about now?

MS. BEHLING: Yes, we're seeing it, Steve. This is Kathy.

DR. OSTROW: Okay, great. Okay. All right. Let me continue now. Okay. Okay. Or actually, I'll back up quickly.

All right. So, just quickly, the purpose was to assess the impacts of Rev. 2 with the occupational dose TBD on previously completed dose reconstructions. The plant's constructed by GE 1956, Clearwater, Florida. And the main purpose was to produce miniature neutron generators, which were used as triggers for nuclear weapons and accelerating deuterium into

tritium targets and producing neutrons as a trigger. And after about ten years, the plant operations, the main part, was expanded to include other things, including radioisotopic thermoelectric generators, RTGs, which contains plutonium as the heat source.

The site consisted of one really large building, 100, which had a lot of different areas and a bunch of smaller buildings around it. So, it's a good size operation. In all, there were 17 smaller buildings. Okay. At its peak the plant employed about 2,000 people. The numbers went up and down over the years, but about 2,000.

And the period's divided into operational period, 1957 to 1994. Again, D&D operations in 1995, which ran about two years. And then at the later point, remediation. That's after the plant is cleaned, been D&D'd, to return it to, you know, commercial use. That went on for a couple of years also, remediation period.

Just to mention too, we're talking about periods. I didn't put this on the slide. There's currently an SEC -- special exposure cohort -- 256 review going on. We have a Pinellas work group. And the covered SEC period is 1957 to 1990. So, it begins and ends a few years before the end of the operational period. And that's under review right now.

Radiation sources can divide them into two different areas. The things that are radioactive, material that emits radiation continuously, and devices generate radiation. And those generate radiation when they're on and don't generate radiation when they're turned off. So, there's two different -- just for convenience, two different things.

Okay. Looking at it, as I mentioned before, tritium targets and

neutron generators, plutonium oxide in the heat source in the RTGs. Just mention two things: One, the -- the plutonium heat sources were triply encapsulated in stainless steel. So, there's no leakage, no contamination, and so forth. And the -- Pinellas didn't -- did not manufacture the heat sources. They received them from Los Alamos.

There's a uranium radioactive material. Uranium was used to store the tritium. They had glass structures that had uranium, and tritium -- you got uranium tritide, and that stored tritium. The uranium was plated onto the glass structures. Leak detection systems, there were two of them that use Krypton-85 gas as part of leak detection. The miscellaneous -- you know, since it was a nuclear facility, like any nuclear facility, you had instrumentation, calibration, check sources, miscellaneous other radioisotopes that really don't amount to much. And Carbon-14 was used as a radioactive label in some lab solvents. Main sources, though, were the tritium and plutonium.

Radiation generating devices, you have the neutron generators, which I mentioned, there were small linear accelerators, and you got 14.1 MeV neutrons coming out of it, plus an alpha particle. There was some ion accelerators, materials analysis, and so forth. X-ray diffraction, electron beam equipment, medical X-ray exam equipment.

And just in our -- just recently, after we did this report and all that, just -- we sort of discovered there were two additional neutron sources. One was something called an active, slash, passive neutron examination assay -- assay system, AONE, A-O-N-E, which in the early days of the plant, this was like a side job that they had. It was in Californium-252 fission --

spontaneous fission source that generated, I think, ten to the 7th neutrons per second. And this was part of a materials testing program that they ran in the early days. Given the barrel of nuclear waste that you want to dispose of, how could you tell if you were actually throwing away any fissile material? So, this was a -- a project that they had at the plant early. So, they had this californium source, which was sort of separate from everything else, a separate building and just due to assays.

And they also had another machine, which is sort of interesting, called the zetatron, Z-E-T-A-TRON, which was a 14 MeV-pulsed neutron source that generated about ten to the eighth neutrons per second. It was also used for this assay project at DOE. This was aside from their normal operation. I'm just mentioning it for completeness.

Okay. So, what is -- potential external exposure has -- because we're just talking about external here – tritium, low-energy beta emitter, and it occurs in several forms: tritiated water, tritium gas, organically bound tritium, and metal tritides, it's well known it's a low external radiation hazard, low energy. Krypton-85, which is beta emitting, and it's high enough to cause a skin dose. But there was no evidence found of such an exposure. And plutonium decay with radioactive decay produce neutrons and gammas and spontaneous fission, low amount. And daughter products also emit radiation.

Uranium alpha particles and X-rays. And as uranium decays, it also is -- the decay chain progeny emit different types of radiation. Carbon-14 is a beta emitter considered negligible hazard. Wasn't much of it there. And Nickel-63, which is used in krytrons, which are high-speed switches used in

nuclear weapons, negligible amounts, low energy. So, those are the potential external hazards.

The workers were exposed to electrons, you know, beta particles, protons and neutrons. So, the photons primarily in the RTG production area from the plutonium oxide sources and neutrons -- the neutron generators are the two main sources of external radiation. This -- the TBD provides information on external radiation dosimetry through the years, and I just listed on this table where it can be found. There wasn't any -- no need for this presentation to repeat the tables. But it shows what kind of dosimeters they used over the years.

All right. So, now getting up to the actual subject: Changes necessitate -- necessitating the PER. Well, I've mentioned this already that NIOSH produced the current version of the TBD, Rev. 2 in 2017. This was in -- this was in response to several SCR -- and this is a typo. It should be work group reviews and discussions that were conducted. The PER itself lists two revisions to the TBD that resulted in increased defined doses. And I put in parentheses "claimant favorable," because if you increase the assigned dose, it's claimant favorable.

And the -- in summary, -- this is another funny typo -- eliminated the assignment of onsite ambient external dose and replaced it with more favorable unmonitored dose, which is like a co-exposure model. So, it's one thing it did. And the monitored and unmonitored doses increased for all the years, the tritium doses.

So, what did we do? We assess the NIOSH's evaluation and characterization of and issues addressed in PER-79. And we concur with

NIOSH's determination that the changes in the TBD warranted a re-examination of the previously done dose reconstructions.

Subtask 2, assess the corrective action methods. The -- as I just mentioned that eliminating the assignment of onsite ambient external doses and replacing with the more favorable unmonitored dose is a factor that increases the assigned external dose. And we looked into it.

The 2nd bullet. This is following the guidance of the new TBD, Section{#N} 6.5.1, and they have a large attachment B of external dose TBD, which goes into external dose methodology. Two things: The TBD assumes that workers with potential for external exposure would monitor it, and those with little potential were not monitored. Hence, whatever dose the unmonitored workers might have received were less than those in monitored workers. The claim is that the plant, Pinellas, had a good health physics program, and they monitored pretty much every one of them needed to be monitored, etc. And the -- for the -- the TBD assigned the claimant favorable and unmonitored external dose of 100 millirem as justified in attachment B to the TBD. We found that was reasonable.

So, the conclusion. We reviewed Rev. 2 and previous versions of the occupational external dose, and we determined that the -- all issues was resolved. And this has been over the years and the concurrence of the work group, the Pinellas work group, that there weren't any issues in the TBDs.

So, we believe that it's acceptable to use assumptions methodologies and data when performing dose reconstruction reviews. So, we have no findings associated with Subtask 2 of the PER.

Selection criteria. All right. This is -- this is typical. NIOSH went

through all the previous D -- dose reconstructions for the plant and came up with 529 of them. This was at the time of the PER preparation.

They removed 16 claims. Of course, the -- they were removed by the Department of Labor for various reasons. Seven claims are currently active at NIOSH after being returned to re-work. Seventy-six claims were eliminated because they already had a probability of causation greater than 50 percent, so there's no reason to look at it again. Four claims were compensated under a non-Pinellas special exposure cohort. So, they already were compensated, the Claimants. Thirty-nine had no Pinellas employment or visits. Three claims were eliminated because they were completed after the TBD was revised, four claims were returned to NIOSH prior to this evaluation.

And 100 -- so, summary, 149 claims were removed in total, leaving 380 claims to reconsider. So, after the whole process, they were left with 380 claims to look at again.

So, our conclusion -- little caveat. At the time, Pinellas -- SC&A did not have access to NIOSH claims tracking system, NOCTS, at the time of the review to evaluate the data used to identify and quantify these issues, these cases. But we agree that the selection criteria -- criterion NIOSH used should have included all affected non-compensated claims. So, we had no findings (indiscernible) Subtask 3.

So, Subtask 4, the last one we do now, and we recommend that the -- the Board select two cases for production workers covering the operational period with probability of causation still less than 50 percent after NIOSH reworks the dose reconstructions.

So, that's it. I'll be happy to take any questions or comments.

CHAIR BEACH: Thank you, Steve. Good job.

Any questions comments?

MEMBER VALERIO: This is --

UNIDENTIFIED SPEAKER: (Inaudible.)

MEMBER VALERIO: -- Loretta. No questions, no comments.

CHAIR BEACH: Okay. Thanks, Loretta.

And hearing none, I would agree that we need to select two cases and add that to our list. And with that, not hearing from anyone else, thank you, Steve.

DCAS-PER-036, rev. 0 "Blockson TBD Revision" Presentation

CHAIR BEACH: And I think we can move on to our PER-36, which is Blockson. And Kathy, you're back on.

MS. BEHLING: Yes. And are you seeing my screen?

CHAIR BEACH: Yes. You're getting fast.

MS. BEHLING: All right. So, we have another PER here. This is PER-36, and PER-36 is associated with the Blockson Chemical Company. So, this first slide is going to provide a history of the Blockson documents. The TBD was initially issued in September of 2006, and it was revised in June 2007 to expand on the site description. It added new radiological data, and it added several radionuclides. And since these changes resulted in an increase in dose -- doses, Rev. 1 resulted in the issuance of PER-20.

There were also two additional revisions in November of 2007, and Rev. 3 in December 2010. And I will also note that the Blockson TBD was

revised a fourth time in May 2014, which prompted PER-60, which was previously reviewed by SC&A.

Okay. So, today's discussion will focus on PER-36. As I said, this was issued due to changes introduced in Revisions 2 and 3 of the Blockson TBD. So, monitoring at Blockson, bioassay records were found and they indicated that workers were monitored for internal exposure of uranium during the years of 1954 through 1958; however, no external monitoring records were found. There was also an SEC granted from March 1, 1951, through June 30th of 1960, and that was due to the inability to reconstruct doses from exposure to radon.

Okay. Where am I here? Bioassay monitoring, I did -- I said that, and I didn't move it. I apologize.

Okay. Moving on. SC&A review -- review of the Blockson documents included PER-20, as I mentioned earlier, and the -- the Subtask 1-3 Report was issued in March of 2009, and Subtask 4 Report was issued in October of 2013. I -- we have a -- and today's discussion with PER-36 is linked to this document, and this is Subtask 1-3.

So, under Subtask 1, we reviewed the changes that prompted the issuance of the TBD. And in this case, Revision 3 of the TBD increased doses from radon exposure after 1963 to the end of the residual period, and particulate intakes increased during the residual period after 1977. So, we agreed that that warranted issuing this PER, and all the issues were covered in the PER.

So, under Subtask 2, here we assessed NIOSH's corrective action and performed a review of any related technical document -- documents not

previously reviewed for Blockson. SC&A, as I mentioned, reviewed Rev. 1 and 2 and 4 because of a -- findings that were identified in our assessment of PER-20. So, under PER-20, we had six findings, three of which were associated with Subtask 1-3 Report, and included potential exposure of Building 55 workers to Type S uranium compounds. And, if ingested, a lower solubility uranium material would imply a lower f1 value or fractional absorption from the GI tract to the blood. We also felt that it was that in a -- that inappropriate surrogate data was used to estimate indoor radon concentrations that resulted in low exposure values.

For the three findings under Subtask 4, one of the cases, the internal dose calculation was (audio dropped).

CHAIR BEACH: Kathy, we lost you. Can anybody hear me?

DR. ROBERTS: Yes, I can.

MR. BARTON: (Indiscernible), Josie.

CHAIR BEACH: I was like, did we lose Kathy or did I drop out?

MS. BEHLING: Are you still hearing me now?

CHAIR BEACH: Now we are. Yeah.

MEMBER FRANK: Yeah, we can hear you again now.

MS. BEHLING: Okay. When did you lose me? Where do I need to go back to? I'm sorry, I didn't realize. I don't know how that happened.

MR. BARTON: We were on Slide 8.

CHAIR BEACH: Yeah.

MS. BEHLING: Okay.

CHAIR BEACH: I was trying to figure out where we were. Probably just in the middle.

MS. BEHLING: Okay. All right. So, I'll -- briefly you can read on the screen here -- are you still hearing me?

CHAIR BEACH: Yes.

MS. BEHLING: Everyone hearing me? Okay. Great.

So, what I was saying is that under our PER-20 review, we had six findings. Three were associated with the report -- the Subtask 1-3 Report and three were associated with Subtask 4 case reviews. And the case reviews, the internal dose calculation was not consistent with the TBD Rev. 2 guidance. And also, calculation of internal dose was not consistent with the TB -- TBD Rev 2 guidance. And we identified a potential error in the Blockson Building 55 inhalation tool.

So, SC&A was able to confirm that all those findings were closed. And that was because of the issuance of TBD Rev 4, the establishment of an SEC, and an update to the Building 55 inhalation tool.

So, in addition, we performed a side-by-side comparison for this review of Rev 2 and Rev 3, just to verify that the changes described in PER-36 and in Rev. 2 of the TBD were effectively updated. And based on this review, we had no findings.

Okay. So, under Subtask 3, we assessed NIOSH's approach to identifying potentially affected claims. So, in this case, there were two populations of claims that were based on the impacted exposure pathways. So, claims in Population 1 were reassessed because of an increase in radon exposure. And for Population 2, they were impacted by changes in the particulate intake. So, in determining claims that required a rework of dose reconstruction, NIOSH developed a selection criteria. So, for Population 1,

the selection criteria included all claims with POCs of less than 50 percent. The dose reconstruction was completed or approved prior to December 20, 2010, which was the issue date of Rev. 3 of the TBD. Thirdly, the EE's employee -- employment was after 1962, which represented the residual period dates that were impacted. And then lastly, the EE was diagnosed with a cancer of the respiratory tract.

For Population 2, the first two selection criteria were the same as Population 1. And then lastly, the employment period needed to include time -- employment after 1977, when the particulate intake increased. This was -- this resulted from the residual period start date changed from April 1st of 1962 to July 1st of 1960, so larger intakes were associated with the earliest years, and therefore the total intake for a claim could increase or decrease depending on the energy employee's employment period.

Ooh, sorry about that. Oh, geez. What did I do? Okay. Are you seeing that now?

CHAIR BEACH: Yeah. We never lost it.

MS. BEHLING: Okay. All right. The reason I hit a wrong button here. Okay.

So, based on these selection criteria, NIOSH identified four claims for Population 1, but three of those were included in the SC& -- in the -- yeah -- SEC, and they had no additional non presumptive cancer. So, they reworked only one claim for this population, one that was less than 50 percent. And The result of that PO -- reworked POC was less than 50 percent.

So, for Population 2, NIOSH compared integrated intake rates for Rev.

2 and 3 for various employment start dates. And based on that, it was determined that EEs with employment starting after 1974 and continuing to the end of the residual period would have higher intakes under Revision 3. So, 32 claims were identified with employment after 1977. However, all those claims had start dates prior to 1975 and therefore, they were eliminated since their dose would decrease.

So, SC&A -- assessment of Subtask 3, and again, although we did not have access to the claims tracking system at the time to identify and quantify the cases, SC&A does agree with the screening and selection criteria that NIOSH used, and we believe that all applicable -- yeah -- applicable cases were identified. SC&A also independently compared the integrated intake rates for both Revisions 2 and 3, and we were able to confirm that workers with employment dates prior to 1975 would have lower total intakes. So therefore, we had no findings or observations for Subtask 3.

And this is easy. Under Subtask 4, there was only one case that was reworked. And so, that's the case we would like to look at.

And that's the end of the presentation. Any questions?

CHAIR BEACH: Thanks. Thanks, Kathy. Sounds fair enough to look at that one case.

MS. BEHLING: And --

Any questions or comments?

Go ahead, Kathy.

MS. BEHLING: Yeah, I was just going to -- I was going to quickly ask Lori a question. I don't mean to put you on the spot, Lori, but you and I had

talked that perhaps we were going to be able to get access to the BRS data. And this would reduce your workload, because we could go out there and find -- find that case and start reworking it if we had access to that. And I don't know if that's something that's still in the works or something we are going to be getting soon.

MS. MARION-MOSS: This is Lori. Yes, we're -- it's in the works. So, -- so, once it's finalized, I'll let you know.

MS. BEHLING: Okay. Thank you, Lori.

CHAIR BEACH: Okay. That would -- sounds like that would be helpful.

Any --

MR. BARTON: And this is Bob. Are -- are -- are we talking about the BRS or NOCTS here? Let's --

MS. MARION-MOSS: I'm sorry, Bob. I -- I knew what Kathy was referring to. It's the --

MS. BEHLING: Yeah.

MS. MARION-MOSS: -- application that we will be giving you guys access.

MS. BEHLING: Yeah, --

MR. BARTON: Okay.

MS. BEHLING: -- I apologize.

MR. BARTON: Thank you. Okay. Thank you.

MS. BEHLING: Yeah. I'm so focused on the BRS, I apologize. I meant to say -- yeah, there is a PER database out there that we always had access to. And -- and so, we could go out and find this particular claim, but we don't have access to -- access to it at the moment.

CHAIR BEACH: Okay. Sounds like --

MR. BARTON: Perfect.

CHAIR BEACH: -- it's in the works, --

MR. BARTON: Perfect.

CHAIR BEACH: -- which is great. And you wouldn't normally just go out and do that without -- I mean, you -- between you and Lori, you would -- she would know which ones you could just go find and start on, correct, --

MS. BEHLING: Yes.

CHAIR BEACH: -- once tasked? Okay.

MS. BEHLING: Right. And in the past, they could give us claim numbers, and we could just go into that database so we could get -- sometimes get the information we needed. Now that we don't have access to that -- no, I -- we -- we didn't do that on our -- on our own or go out there and select cases. But when they were selected, we were able to find them from there.

CHAIR BEACH: Okay. Understand. All right.

Any other questions before we move on to PER-39?

Thank you, Kathy. Good reporting.

DCAS-PER-039, rev. 0 "Baker Perkins TBD Revision" Presentation

CHAIR BEACH: And I think, Amy, you're up.

You're going to get a bit of a rest, Kathy.

MS. BEHLING: Yeah. Okay. And I'm going to pull Amy's slides up here. And we are on -- let's see. PER-39. Okay. Okay. Are you seeing my --

MR. BARTON: Are we --

CHAIR BEACH: Yes, we're seeing them. Thank you.

MS. BEHLING: Okay. And Amy, are you there?

MS. MANGEL: Yep, I'm here. Thank you, Kathy.

Can everyone hear me okay?

CHAIR BEACH: Yes, I can.

MS. MANGEL: Okay. Great. So, I'm Amy Meldrum. I'll be presenting our review of PER-39 for Baker Perkins.

The purpose of the PER was to address the impacts coming from issuing Rev. 1 of the TBD for Baker Perkins on previously completed cases. For a bit of background on the site, at the site, they developed industrial mixing machines. They were initially intended for the food industry but were later used in the chemical industry processing. Baker Perkins produced mixers called the Ko-Kneader, and in 1956 this was tested to use for mixing uranium compounds for Fernald. The tests were performed for a few days in 1956, from May 14th through the 16th, and then afterwards the -- the equipment that was used in the test was decontaminated between May 15th through 18th. So therefore, the covered period extends from May 14th through the 18th of 1956, and there's no residual period as all equipment was decontaminated and cleaned after the test.

Back in 2011, SC&A did review Rev. 0 of the TBD, and in that review, there were four findings and six observations. And then Rev. 1 of the TBD was issued May 1, 2012.

For Subtask 2, there were changes made to some of the dose reconstruction methods that were incorporated into Rev. 1, and this resulted

in increased inhalation doses. Like I said before, we previously reviewed Rev. 0, so our Subtask 2 review for PER-39 is focused on just the changes that were made in Rev. 1 -- going from Rev. 0 to Rev. 1.

For occupational internal dose, the internal dose is based upon alpha air samples, both from the breathing zone and general air samples that were collected during all phases of testing. The biggest change going into Rev. 1 is that formerly there were four job categories and then this was condensed into three. So, previously, the categories were operator, laborer, supervisor, and clerical. And then now in Rev. 1, operator and laborer are together, there's a category for supervisor, and a category for other, and a more detailed timeline of the test was used to calculate the doses.

The operator, slash, laborer category is applied to workers who were more involved with the hands-on tasks, and the breathing zone air samples were used for the dose calculations for this category of workers. The supervisor category is used for workers who were in the vicinity of the activities, but not necessarily doing the hands-on work, and those dose -- doses are based upon the general air samples. And the other category is for workers who would not have routinely been directly in the area of the testing, but could have infrequently entered the area, and they were assigned 10 percent of supervisor category dose. NIOSH calculated both inhalation and ingestion intake rates for each category.

Our 2011 review of the TBD had two findings associated with internal dose: one having to do with the air concentration assignments and one having to do with using the 50th percentile values. And NIOSH had responded to these findings, and we responded to NIOSH's response and

found that NIOSH had adequately addressed all of our original concerns. So, we confirmed that the methods detailed in NIOSH's white paper were incorporated into Rev. 1 of the TBD, and we also confirmed that the resulting internal dose estimates were higher for all job categories, so we had no findings or observations on internal dose.

For occupational external dose, there were no external readings collected during the testing. The highest exposure potential would be from drummed uranium, so NIOSH calculated external dose assuming workers were 1 foot away from a 55-gallon drum of Uranium-238 for the entire day, and all worker categories received the same external dose estimates. And Table 5 in the TBD details the external photon dose, skin dose, and dose to the hands and forearms.

Our 2011 TBD review had two findings and one observation associated with external dose. One finding had to do with submersion dose. Another finding had to do with considering two drums of uranium and an observation of -- had to do with the inconsistency with the labor categories between internal and external dose estimates. Again, NIOSH responded in a white paper and in that white paper, it stated that dose from a drum of uranium was more claimant favorable than using surface contamination, and that all of the uranium that would -- that would use in the test could have fit into a single drum. So, no changes were made to the assigned doses from Rev. 0, but additional clarifying language was added into the document. So, we had no findings or observations about external dose.

There's no site-specific guidance for the site for occupational medical dose. It's stated to use OTIB-6 to assign medical dose and assume just one

chest X-ray for the year 1956. And we agree with this guidance to use OTIB-6.

For Subtask 3, all completed claims with a POC of less than 50 percent result -- was eight claims, and all eight of the claims were re-evaluated using Rev. 1 of the document. All eight of them had a POC below 45 percent and the highest was below 15 percent. The POC increased for three claims and decreased for the remaining five. We agree that NIOSH's selection criteria was broad enough to capture all the claims that could have been affected by the PER. And the PER was conducted in a timely manner. Rev. 1 was issued in May of 2012. PER was issued in January of 2013, so we have no observations for findings or observations for the subtask.

SC&A recommends that we select one of the cases where the POC increased, and one of the cases where the POC decreased for the audit of the DRs for this PER.

And that's it. Pretty -- pretty short.

CHAIR BEACH: Thanks, Amy. Pretty concise.

Comments or questions, subcommittee?

MEMBER VALERIO: Josie, this is Loretta. I have one question, I think. If we can go back, I believe it was (indiscernible) Slide 3. And then (indiscernible) take me a minute to focus on this. So, under the second bullet, it says if the tests were performed for May 14th through May 16th. Okay. But it also says that if the equipment was decontaminated and cleaned between May 15th through May 18th, so the 15th kind of overlaps with the -- the test period or the test date, I guess. And I'm just wondering, --

(Whereupon, there was an audio interruption from an attendee's telephone.)

MEMBER VALERIO: -- was the decontamination ongoing during the testing, and would it affect the breathing zone air samples at all?

MS. MANGEL: It's possible that this might have been a typo. I will double-check the dates and get back to you on that. And if it did overlap, I will let you know. But this might just be a -- a typo. I will check.

MEMBER VALERIO: Thank you.

CHAIR BEACH: And --

MEMBER FRANK: This is Arthur. I've got a question. Not specifically about this case, but do we know from other settings when you said there were no -- several badge readings done over this very short period of time, how much radiation would have been given off by, you know, a drum full of the U-238? Do we have any -- any sense from any other -- does anybody have any sense from other settings how much that would have been? You know, it seems like just a few days is very short, unless the exposures were very high.

MR. BARTON: This is Bob. There are studies that have been done, and they are documented in documents like TBD-6000 that talk about what -- you know, the 1 meter dose from a drum of contaminated material, uranium is. So, there are ways to do it. I'm not sure they've been approved for this specific site.

CHAIR BEACH: Yeah, I think --

MEMBER ZIEMER: Well, this -- yeah.

CHAIR BEACH: Go ahead.

MEMBER ZIEMER: Well, this is Ziemer. Actually, the calculation of something like a drum of U-238 at a particular distance is a fairly straightforward calculation for any health physicists. So, I mean, I don't have those numbers at my fingertips, but that -- that's like a health physics 101 calculation. So, the answer is yes, you can do that very easily. And for 238, it would be pretty low.

MEMBER FRANK: Okay. Thank you.

CHAIR BEACH: Thanks for jumping in, Bob and Paul. And good question, Loretta. Anything else?

I think we can go ahead and pass the cases for this, the two cases.

Okay. Let's do a check. Are we needing a break, or do we want to move on to NIOSH's responses, Section 3?

MS. MARION-MOSS: Hi, Josie. This is Lori.

MEMBER FRANK: It's up --

CHAIR BEACH: Hi, Lori.

MS. MARION-MOSS: I don't know about anyone else, but I could use a break.

CHAIR BEACH: Okay. I was assuming. We've been going for two hours, so --

MEMBER FRANK: (Indiscernible) --

CHAIR BEACH: -- Rashaun, can we go ahead and break? Oh, I'm sorry?

MEMBER FRANK: Yeah, I was going to say, --

CHAIR BEACH: Go ahead.

MEMBER FRANK: -- at some point, you need a break. I mean, it's -- if

the NIOSH response would be short, we could do that, but otherwise, a break would be appreciated.

CHAIR BEACH: Yeah, there's a couple. Let's go ahead and break here. And shall we go ahead and take a little longer break, Rashaun, and just stay connected?

DR. ROBERTS: Sure. So, how long would you like?

CHAIR BEACH: Thirty minutes works for me. Can everybody else get a bite to eat in that amount of time?

MEMBER ZIEMER: Yes.

MEMBER FRANK: Thirty minutes is a (audio drop).

MEMBER VALERIO: Yes.

DR. ROBERTS: Okay. Okay. So, around 1:36 Eastern?

CHAIR BEACH: Yes, that would be -- or one -- 1:40, just to round it off. That works great.

DR. ROBERTS: Okay.

MEMBER ZIEMER: Okay.

DR. ROBERTS: Sounds good.

MEMBER ZIEMER: Sounds good. Thank you.

CHAIR BEACH: Thank you.

(Whereupon, a break was taken from 1:08 p.m. EDT until 1:40 p.m. EDT.)

DR. ROBERTS: Actually, it's about 1:40 Eastern time, so let me get the (audio drop) Beach?

CHAIR BEACH: I am here.

DR. ROBERTS: Okay. Bronson's out. Frank?

MEMBER FRANK: Here.

DR. ROBERTS: Valerio?

MEMBER VALERIO: I'm here.

DR. ROBERTS: And Ziemer?

MEMBER ZIEMER: Yes, I'm back.

DR. ROBERTS: Okay, great. And just a quick reminder to everyone to please periodically check your phone and make sure you're on mute. And please do not put this call on hold.

Okay. Over to you, Josie.

MEMBER ZIEMER: Josie, this is Paul. Quick question -- comment. I am going to have to leave the call briefly about 2:45, and I'll come back as soon as I can, hopefully within a half hour. If there's any critical -- I think you still have a quorum, don't you? Rashaun, do we still have a quorum?

DR. ROBERTS: Actually, with Bronson out, let me think about this.

MEMBER ZIEMER: We still have -- we still have three out of five.

DR. ROBERTS: Yeah, yeah, I think --

MEMBER ZIEMER: Well, I was just going to say, if there's any critical votes, maybe you can hold -- or if -- if -- if there's a consensus issue during that time while I have to be out, we can handle it afterwards. But I'll have -- I have -- something critical has come up. I have to leave for about a half hour or so.

DR. ROBERTS: Okay.

MEMBER ZIEMER: But that'll be at 2:45. I'll let you know when I'm leaving.

DR. ROBERTS: Okay. Great. Thank you.

CHAIR BEACH: And if you find that it's a problem, let us know. Let us know, Rashaun.

DR. ROBERTS: Will do.

CHAIR BEACH: Okay. Thank you.

NIOSH RESPONSES TO SC&A REVIEWS

Battelle-TIB-5000, rev. 00 "Default Assumptions and Methods for Atomic Weapons Employer Dose Reconstructions"

CHAIR BEACH: All right. Let's go ahead. And it looks like we're at Section 3, NIOSH responses. And I know we don't have any presentations. Are you just planning on doing a verbal on those? And I don't know if it's Brant or who's...

DR. ULSH: It's me, and yes, I think those are just verbal.

CHAIR BEACH: Oh, I think you're on the computer again, Brant.

DR. ULSH: I'm sorry. I --

CHAIR BEACH: I'm not hearing you on the phone.

DR. ULSH: You're right, you're right.

CHAIR BEACH: Okay.

DR. ULSH: Yes. It's just going to be verbal.

CHAIR BEACH: Okay. Perfect. If you're ready to start, I think we're ready.

MS. MARION-MOSS: Before we get -- (audio drop) Lori. Can you hear me, Josie?

CHAIR BEACH: Yes. Go ahead.

MS. MARION-MOSS: Would you like me to share the BRS, because we're going to be speaking from the BRS.

MS. MARION-MOSS: You know, that would be great. Thank you.

DR. ULSH: All right. I guess, while Lori is pulling that up, John, if you can -- you're on deck, so...

DR. CARDARELLI: Roger that. Thank you. I'll wait for Lori to show it. And, Lori, when you do get it up, just if you could go to Observation 6 first. There's only two observations that we need to go over for this part of the agenda.

CHAIR BEACH: Yeah. And I think I read, it's listed under 6, correct, your response?

DR. CARDARELLI: Yeah. Well, we have our response on Observation 5 and Observation 6, but Observation 6 should be literally almost a 30-second kind of summary, and then the rest of it belongs on --

CHAIR BEACH: Oh. Okay.

DR. CARDARELLI: -- Observation 5. That's why I was going to go --

CHAIR BEACH: Okay.

DR. CARDARELLI: -- a little out of order.

CHAIR BEACH: Makes sense.

DR. CARDARELLI: Okay. So, Lori, if you can, hit the plus button on the lower left corner of Observation 6.

MS. MARION-MOSS: Can you see my screen?

DR. CARDARELLI: Yes, we can see your screen.

So, for -- without going into too much background, the bottom line is that there was a comment that the GSD of 10 being excessive, and NIOSH

concurred with that and also followed up and said we don't even use the TIB-5000, nor do we use GSD of 10 in our current. We do apply a GSD of 5 and SC&A concurred with our response to that, but they kept this observation open because it somehow -- it is somewhat linked to Observation No. 5, which had about -- a discussion about GSD for the biokinetic internal dose models. So, the -- there is no discrepancy from the finding -- or from the observation between NIOSH and SC&A on Observation 6. So, at the conclusion of the next part, I would hope that we could just at least close out Observation 6.

So, let's go to Observation 5. Observation 5, the comment was we lacked technical written protocols for how we apply the -- the geometric standard deviation for our ICRP-60 internal dosimetry models. And NIOSH had first said that we will respond with a report. You will see in the BRS there and under attachments that a report has now been made available. It is on our website, and it's Report-0109, Rev 0. Uncertain --

There -- yeah, thank you.

"Uncertainty in Fitted Dose and Internal Dose Assign -- Assessment." The bottom line for this is that we've done the analysis, and we can show that the overall internal biokinetic models for the geometric standard deviation all fall under 3, and we apply a dose -- a GSD of 3. So, we're being claimant favorable in that aspect.

So, we've responded to Observation 6, and this is our response to Observation No. 5. And that really is the summary. We would hope that we would be able to close these out. If that is successful, we would then move to close to T -- TIB-5000 since it's no longer being applied or used in our

program. Are there --

CHAIR BEACH: Okay. That makes --

DR. CARDARELLI: -- any questions?

CHAIR BEACH: -- sense. And yeah.

Any comments from SC&A?

MS. BEHLING: Yes, this is Kathy. Yeah, I did look over their response, and I -- the only thing I have to say is -- to Report-109, we have not reviewed that yet. So, I -- I realized that GSD of 3 is pretty standard to be used in this program, but for us to feel that we can resolve Observation 5 and Observation 6, I think, because when I read your Observation 6, it seemed to also refer to -- it referred to NIOSH's response that they were going to have -- put together a report, and this report is now out. But I would just suggest that we get an opportunity to look at that before we completely close this up, these observations.

CHAIR BEACH: Okay. I am in agreement with that. Is that a separate tasking that we would need to do, Rashaun, or would it fall in under this?

DR. ROBERTS: I think it falls under this.

CHAIR BEACH: Okay. Then I would -- as far as I'm concerned, other subcommittee members chime in, I think we can go ahead and agree to let SC&A look at this Report-0109. And then at our next meeting, we can just cross the T's and dot the I's and close these out unless there's something else, Kathy?

MS. BEHLING: No, it's just that if we get cast for this, we usually get, like, a six-month time period to review that and submit a report. Unless you

want us to just review this, do -- I don't know if we can do a focused review on -- maybe not (indiscernible) that better, but do you want a full review or a focused review? I'm not even sure if that's possible to just answer or to --

CHAIR BEACH: No, (indiscernible) --

MS. BEHLING: And I can --

MEMBER ZIEMER: Well, this is Paul. Oh, go ahead.

MS. BEHLING: No, I'm sorry. Go ahead. I can --

MEMBER ZIEMER: This is Paul. I would suggest that they just focus on this issue and close it out, if possible.

CHAIR BEACH: So, you're saying --

MEMBER ZIEMER: -- the report --

(Whereupon, Chair Beach and Member Ziemer speak simultaneously.)

MEMBER ZIEMER: The report's not that long, is it?

MS. BEHLING: Forty-three pages.

DR. CARDARELLI: No, I --

CHAIR BEACH: Yeah. I -- I'm wondering, Kathy, if we can do like a two-step -- do a focused review with this issue, and then if it's -- if it feels like it needs a full review, then we could come back and task a full review. Does that make sense or not?

MS. BEHLING: That makes sense to me.

CHAIR BEACH: Subcommittee members --

MS. BEHLING: And I just --

(Whereupon, Chair Beach and Ms. Behling speak simultaneously.)

MS. BEHLING: If I could ask NIOSH a question, I apologize. I could -- I see you didn't put any response to Observation 6. Does the response for

Observation 5 also -- it seems to me like it does also apply to Observation 6, but I didn't see it.

DR. CARDARELLI: No, I --

MS. BEHLING: I (indiscernible) -- okay.

DR. CARDARELLI: Observation 6, we do have -- well, our response is actually built into your -- your notes there, where it says (reading): NIOSH concurs with the use of GSD of 10 for an entire site is -- is excessive. So, there's no -- no difference of -- we've already concurred that. So, if you want something more official, I can add that in there. And it was only kept open because you wanted to have Observation 5 also available because of the potential link to the modeling aspects and how geometric standard deviations are applied. Observation 6 is more from an environmental standpoint, and Observation 5 was an internal dosimetry standpoint. So, --

MS. BEHLING: Okay. I --

DR. CARDARELLI: -- 6 is somewhat irrelevant to -- to the big issue since we're already in concurrence. Observation 5, you're right, Report-109 is our response to that. And if you want to review it, you're certainly welcome to do so.

MS. BEHLING: Okay. Thank you.

CHAIR BEACH: Okay. So ,I'm assuming --

(Whereupon, there was audio interference from an unmuted attendee.)

CHAIR BEACH: -- we're going to leave these open until -- who -- who's speaking? Okay. I thought I heard someone.

So, we'll leave these open, do a focused review on 109, and then

maybe get back to us on if we need a full review. But if -- see if you can determine if it covers this five -- Observation 5.

MS. BEHLING: Okay. And Josie, can we put this in progress --

CHAIR BEACH: Yes.

MS. BEHLING: -- while -- okay.

CHAIR BEACH: Yeah. Yeah. I would say so.

MS. BEHLING: That's typically what we do.

CHAIR BEACH: Okay. That sounds great.

Any objections? Comments?

DR. ULSH: This is Brant. My only comment is you might -- Lori, you might want to keep the BRS open, because I think Alek is going to talk about Report-87 next.

CHAIR BEACH: Yep, yep. That's what I was just going to ask. Sorry, it's too late.

DR. ULSH: But I mean, do it -- do it in the next three minutes because it's about to sign --

(Whereupon, multiple attendees laugh.)

DR. ULSH: Thanks, Lori.

CHAIR BEACH: Okay. So, we're -- if we're done with TIB-5000, we are moving on to Report-87.

ORAUT-RPRT-0087, rev. 00, "Applications of Regression in External Dose Reconstruction"

CHAIR BEACH: We had one observation -- or eight observations, and I believe NIOSH responded to all of them.

MR. KRANBUHL: Yeah. So, this is Alek Kranbuhl from NIOSH. And I'm going to kind of go through some of our -- well, all of our responses to the SC&A comments on Report-87. So, Report-87 deals with applications of regression analysis and external dose reconstructions. So, Lori, I think I'm going to start on Page 3, if you can get to that.

But kind of -- kind of big takeaways to begin. First and foremost, most of the comments were essentially beyond the scope of the intent of this document. A lot of them are very specific. And -- and I think at NIOSH, we agree that they should be taken into consideration with dealing with a specific site or a specific -- you know, but -- specific application, not necessarily this report, which is more general.

So, -- so, we'll start. I can't actually see where we are, but if we are on Page 3, I'm looking at SC&A observations with responses. Observation 1, I don't know. Can someone kind of give me a --

UNIDENTIFIED SPEAKER: (Indiscernible) 1 open.

MR. KRANBUHL: Okay, perfect. So, Observation 1 was basically comments that the report would benefit from more guidance on how to use the statistical analyses to determine which models are best for the different data sets, you know, for different practical scenarios. And our response was that essentially, as we mentioned in the report originally and in the introduction of our response, Report-87 is intended to be a reference for statisticians who are going to use the report and isn't necessarily prescriptive. So, we really are going to -- when -- when we're using it, when we're applying Report-87, it requires statisticians and subject matter experts to determine the best way to analyze the data that we have on a case-by-

case basis and determine which models are most -- most appropriate and which regression methods are most appropriate.

Observation 2, again, just a -- sort of a suggestion that would it would benefit -- the report would benefit from a more extensive discussion of the different pre analysis methods, like your Q-Q plots, histograms, box plots, tools that should be used prior to selecting a regression method to sort of inform the -- the analyst of the distribution of data. And our response is that we agree with suggesting or the suggestion that we use some of this exploratory data analysis. They're certainly helpful in determining which models should be used for a given data set. And again, Report-87 is a reference for statisticians who use the methods in the report and it's not -- again, it's not prescriptive. So, essentially, very similar response to Observation 1.

Observation 3: So, the -- deals with goodness of fit analyses, basically suggesting that they be expanded and formalized for accurate determination of the quantile -- quantile regression method suitability and goodness-of-fit analysis and post analysis methods like cross-validation statistical testing of the predicted results, which would sort of demonstrate, you know, the appropriateness of the chosen regress -- regression approach. And again, we agreed with -- with the suggestion, very similar to our first two responses that, you know, we agree to very specific sort of suggestion. And again, because Report-87 is more general, and when we actually implement it, we -- we will certainly do these things.

Observation 4 says that final quantile regression method is appropriate and flexible for regression analysis. It's less appropriate than other

regression models with the sample size is small. And, again, we -- our response is that we agree. There are some drawbacks to quantile regression with -- when you have a small sample size or if the underlying distribution is normal lognormal. Again, statistician has to take those factors into consideration when determining how to analyze the available data. Excuse me.

Observation 5: These observations were mostly editorial in nature, so I'm going to skip through reading through each specific one. Just to understand that our response is that Report-87 -- I think it may have been revised already. I'm not sure. Don't hold me to that. But essentially, when -- in our revision process of Report-87, we are going to take the editorial comments into consideration.

Observation -- so, Observation 6 is on the usefulness of covariant information being considered when you determine that -- the form of the quantile regression model that's most appropriate for a given analysis. Again, our response is that we agree that covariant information should be considered, including -- you know, in any analysis including our quantile regression, if you have the information. I think the observation was made previously on a NIOSH white paper. And again, that -- that previous report, Report-60 is under revision with plans to address the covariants, if available, in regression analysis. Excuse me -- in the analysis for -- for the revision of -- of Report-60.

Observation 7 is, again -- this is also from the 2019 NIOSH white paper essentially says to -- in order -- basically, to provide readers with quantified evidence of quantile regression being the accurate method of

analysis. So, the 2019 NIOSH white paper, it should measure the precision of the neutron-to-photon ratio estimates and provide results of statistical testing of the quantile regression fit for the neutron-to-photon ratio estimates. So, our response to this was, again, we basically agree there -- there's essentially -- part of Observation 7, there's two quotes of partial sentences that led to the observation. So, we sort of presented those sentences and bolded some of the text that was -- that I think there's some context that needs to be filled in there. So, these were written by health physicists, not necessarily statisticians. So, you can see the sections that were quoted by SC&A. And sort of some clarification on what we were intending to say. So, basically to -- to close this out, you know, because there's some imprecise language in there, the testing (indiscernible) requests for more evidence that the quantile regression is accurate and for a measure of the precision of estimates. As we sort of mentioned in our response Observation 6, the white paper was more formalized into a report, Report-60, which has updated language and -- and hopefully clarifies some of that misunderstanding.

And then the last observation, Observation 8, was that -- basically, states that NIOSH should consider constructing clear and practical guidelines for intended analysts that outline situations when quantile regression -- regression is and is not appropriate. And again, back to some of our earlier responses, the -- the main focus here is that Report-87 is for statisticians and needs -- every sort of individual case needs to be evaluated individually by statisticians and the subject-matter experts to determine the -- the best way to analyze the available data, so.

And that is pretty much all of our responses to the eight observations. So, hopefully, if there's any questions, I will try to answer.

CHAIR BEACH: Okay. It looks like Bob need -- has his hand up. So, Bob, if you want to go ahead.

MR. BARTON: No, I'll let -- let the subcommittee go first. But I -- I do have a comment.

CHAIR BEACH: Okay. Any questions for subcommittee? I should say from subcommittee members.

MEMBER FRANK: No, nothing from Arthur.

MEMBER ZIEMER: This is --

UNIDENTIFIED SPEAKER: And Arthur, --

MEMBER ZIEMER: -- Paul. Thanks, Brant (sic) for clarifying those. I'm good with it. Thank you.

MEMBER VALERIO: Okay. I have no questions. I have no questions or comments.

CHAIR BEACH: Okay. Great. Thanks, Loretta. And I think this is great moving forward with you being able to pull the BRS up. It's very helpful. Thanks for that, Lori.

And Bob, you're on.

MR. BARTON: All right. Just a general comment. I think a common theme today and elsewhere is that some of these documents are overarching for the entire program. They're not necessarily supposed to be procedural or prescriptive, but more, I guess, philosophical. This is the way we'll approach it, but each individual situation, which we often find, at each of these sites, in each of these individual claimant pages, requires a little bit

of fine tuning to the situation.

So, I think that's where a lot of these comments, which are observations come from our side, is that we're saying, okay, this kind of looks like it's a procedure, but maybe it's not. And I think that's what nick is saying. And I don't want to put words in their mouth, but this is the general way we would approach the problem, but that doesn't mean it's prescriptive. That's the only thing that -- that we would do; we would analyze it.

And again, I don't want to put words in NIOSH's mouth, but I think that's what this report is saying. I think that's what Report-0071 was saying. And then previously 0096, which was on imputation as well, was saying that, listen, this is the -- the best we got right now, but that doesn't mean we can't shift gears depending on the situation. And I -- and I think that's what the Board should take away from it is that we'll -- we'll be watching. So, this isn't just the rule. This isn't the rule. And depending on what situation is encountered by the program, you know, people will pivot, I think. I don't know. I -- I'd ask my interpretation of my comments just now.

MR. KRANBUHL: Yeah. I -- I agree with you. Excuse me. This is Alek, and I agree with you there. I think the big takeaway is that this report specifically, and a lot of the other reports, are sort of like a toolbox, essentially, if you want to think of it that way. You know, we had a lot of methods that we used early on, and this is a pretty advanced method for us compared to what we were doing previously. So, this is just -- it's a toolbox. It presents these methods for the statisticians and helps us to figure out on a case-by-case basis, you know, what's the best tool to -- to

do the job, right.

MS. BEHLING: And Josie, this is Kathy.

MS. BEHLING: Yep. Go ahead.

MS. BEHLING: All right. Yeah. Bob Barton and I review the responses and pretty much agree with everything. And as Bob mentioned, this is very similar to Report-71. And, again, I would just like to get -- and -- and we -- like I said, understand their responses and just I would like to get a confirmation again that the statisticians who -- who work with this report, that they see our -- our report and they're aware of our observations. That was affirmed by -- under Report-71 and I assume, but I would like to get some confirmation that that is the same -- it's the same here with Report-87. I don't know if anyone is on the line that can confirm that.

DR. ULSH: Well, this is Brant. I was looking at the attendees to see if Nancy Chalmers is on the line, and I do not see that she is. But Kathy, you have my commitment that I will send your report to Nancy, and then you can say that the statistician has your report.

MS. BEHLING: Okay.

(Whereupon, multiple attendees speak simultaneously; whereupon, there is audio distortion.)

DR. ULSH: Okay. Yes.

MS. CHALMERS: Brant, I'm on the phone. I'm not on Teams. I'm on the phone, but yeah, I wrote those responses, and so I'm aware of them. We will make sure -- yeah, we will make sure we take all that into account when we do the analyses.

MS. BEHLING: Okay. Very good. Thank you. And I think the -- the other thing that Bob was alluding to is that we have to try to be cognizant and -- and -- and watch for when -- the implementation of Report-87 and, you know, pay attention to that. The only other thing -- I'm willing to sign off on these, but Observation 5 there was listing of things that I -- I -- if I understood NIOSH correctly, that -- and I did check, there is a Revision 1 of Report-87, and perhaps if we could get an opportunity just to briefly look that over, again, a little bit of a focused review, to find out which of those comments that we had were actually incorporated into the report, and how many were, how many weren't. And not that that's going to change our opinion or agreement, but before I sign off on this on the BRS, I'm just wondering if you would suggest that we look at that.

CHAIR BEACH: Yeah, I'm in agreement with --

MS. CHALMERS: (Inaudible.)

CHAIR BEACH: Yeah, Report-0087, Rev. 1, yes, I total -- when did that come out, Kathy?

MS. BEHLING: That was -- that came out in September of 2025.

CHAIR BEACH: Okay. Yeah. I and -- other subcommittee members, I agree that you should take a look at that before we close these out.

MS. BEHLING: Okay.

DR. ULSH: Well, (indiscernible) Kathy said that applied to Observation No. 5 only; is that right?

CHAIR BEACH: Yeah, I think so, but --

MEMBER ZIEMER: (Indiscernible) --

CHAIR BEACH: Oh, go ahead Paul.

MEMBER ZIEMER: I think -- I think it does only apply to 5. Basically, for practical purposes, 6 is really close, I think. In my mind it is, but.

CHAIR BEACH: Yeah. Well, and I -- I have no problem waiting until you update the BRS with your comments on each one of NIOSH's comments and reviewing the Rev. 1 and closing out all of them together.

MS. BEHLING: Okay. (Indiscernible) --

CHAIR BEACH: That's just on SC&A to -- to do and then for us to formalize it, if --

MS. BEHLING: Okay.

CHAIR BEACH: -- everybody's in agreement with that.

MS. BEHLING: And perhaps that's something of a carryover item that we can do. Not going to take a lot of effort, but I would like to get to -- just to look at Rev. 1 before we completely sign off on everything.

CHAIR BEACH: Okay. I think that's a good idea. And so, that -- consider that tasked, along with what you've already been tasked with.

MS. BEHLING: Okay. Thank you.

CHAIR BEACH: Okay. If there's no other comments or questions -- and I think, we can move on to 92.

(Whereupon, the was an audio disruption.)

MS. BEHLING: I'm going to attempt to see here -- there we go. I'll show these slides for Ron Buchanan.

SC&A ISSUED REVIEWS

ORAUT-OTIB-0092, rev. 00 "Correction Factors for Neutron Dose Measured With Nuclear Track Emulsion, Type A Film" Presentation

CHAIR BEACH: And I think we have some NIOSH responses too that were put in on that. I don't know if --

MS. BEHLING: Yeah.

CHAIR BEACH: -- Ron wants to do his report, or is that incorporated in his report? I guess we can get to that when we get to it.

MS. BEHLING: Okay. Are you seeing my screen?

CHAIR BEACH: Yes.

DR. BUCHANAN: Yes.

MS. BEHLING: Okay. I'll turn it over to Ron.

CHAIR BEACH: Morning, Ron.

DR. BUCHANAN: Okay. Morning/afternoon. This is Ron Buchanan with SC&A. I'm a bearded guy in your lower right screen there. I'm going to be presenting a review of OTIB-92, which is "Correction Factors for Neutron Dose Measured With Nuclear Track Emulsion Type A Film." Now, before I get into this -- this is a very detailed presentation. So, before I get into this one, I just want to say that where this comes from is the IAEA, the International Atomic Energy Agency, issued a technical report, Series 318 back in 1990 or so that gave neutron energy spectrum.

Now, a little sideline -- unfortunately, unlike gamma rays which has a certain energy, like Cesium-137, it gives a monoenergetic 662 KeV, most all neutron sources give off spectrum a neutron all the way from thermal up to, say, 20 MeV of our area ventures. And even if it's given off as a monoenergetic neutron, the time it exits and gets into a body, it has underwent moderation, scattering, and a number of reactions, which changes its energy spectrum. And it degrades the energy spectrum all the

way down to thermal, which is, you know, less than an eV. So, it is a harder animal to qualify and quantify than for gamma radiation.

And so, you have neutrons. Most workers in a DOE site are exposed to a wide range of neutrons. And so this presents a problem. (Indiscernible) NTA film back in the early days -- and it goes back about 80 years -- in that NTA film has some limitations on its lower and higher energy. And it's also a response function as -- as the energy spectrum changes.

And so, what has been generally accepted is you divide these -- this widespread of energy from thermal to, say, 20 MeV up into small energy bins, and that's about the best you can do. There's discrete points, of say 100 KeV wide or something. And so, that's the way it's usually attacked.

And so, you have to know a number of things before you can assign dose from an NTA film. And that's what we're going to get into today. Now, the overarching idea of this is to provide the dose reconstructor a summary of correction factors to apply to already recorded, you know, dose -- neutron dose from NTA film in the past. And this OTIB did a very good job of that. They spent 34 pages with some fairly complicated science, and they get to Appendix C. I just want to point out that that is the crux of the matter. It's a one-page appendix, and it is what the dose reconstructor will use to calculate the correction factor if it's needed. And so, I will go into some of the details on what brought us -- on what -- how they derived Appendix C in this presentation today.

Now, they did put out -- the IAEA put out a Report 318, and it listed a number of variables. Two things that -- that are important. They listed the

tracks for neutron as a function of neutron energy bin, and it also listed the dose equivalent as a function of neutron energy bin. Now, later on they issued -- 2001 they issued another report, 403. And in that, they -- they measured a number of different neutron sources and some the same, some different than 318, but they didn't include any tracks for neutron or dose equivalent values. They just listed energy bins as they measured them.

And this is kind of a problem because they use different -- some different energy bins, so you can't just do a direct transfer from 318. And also, some of their energy bins are different, and then they also start to lower energy as, what they call, the main energy bin, and 318 uses the upper energy. So, you have to be aware of that.

I just want to emphasize we're not changing anything in 403. It's just additional data. But we're adding two columns, so to speak, to those -- to those tables. And that is the tracks for neutron and the dose equivalent. And so, those are needed if you're going to do -- determine these correction factors. And so, that's essentially what this presentation will get into some detail about.

Next slide.

Okay. So, this okay was issued by NIOSH in 2024 for the recent document. And it allows the dose reconstructor to apply a neutron energy spectrum correction factor to record the neutron doses measured using the NTA film. Now, the NTA film's been used, like I say, about -- since 1944, since World War II, and the development of nuclear material. And Eastman -- Eastman Kodak was the original one that produced the fine grain into a film in dental packs for use for personnel monitoring in 1947.

Next slide.

Okay. Now in general, just a little bit about this method of measuring neutrons generally were worn mid chest. It detects neutrons reflected back by the body called albedo neutrons. In other words, it doesn't detect the ones impinging on the front like the gamma monitor. But this actually detects the reflected neutrons. It hits the hydrogenous material in the body, thermalizes or decreases the energy of the neutrons reflected (indiscernible) what causes a track -- or sometimes (indiscernible) stars in the emulsion, and that has to be read by the microscope.

And so, this is -- works very well, except, you see, it has a -- an ability to read the stars and diminishes as the energy decreases because it creates less charged particles, so the tracks are shorter. And so, you look through a microscope and read them down. But pretty soon, they become a dot, and you don't know if a dot or a star. So, anything below about a half of MeV is not registered, just a sharp drop-off point.

And that creates problems in a lot of dosimetry because a lot of your -- your moderating neutrons are below half MeV. Fortunately, the dose equivalent for lower energy neutrons is small at the lower energies. But anyway, that's a problem in NTA film. And then you get greater than 20 MeV, and you -- they pass through it, and so you don't get these tracks registered above that.

And so -- next slide.

So, as that would indicate that the NTA film response that tracks for neutrons changes as a function of energy. And so, you want to try to calibrate the badge in the lab with a neutron standard that closely matches

the energy output of the environment the worker will be in where he's wearing the badge. But this is not always possible because often you have multiple exposure sources and a worker out in the field has multiple exposure sources. Neutron energy spectrum is -- the exposure is uncertain, and the fact that the neutron spectrum determined after the NTA film is recorded. So, some of these were recorded 40, 50, 60, 80 years ago, and you're not sure of what the exposure was.

And next slide.

So, the dose recorded is usually on the worker's record as units of -- of rem at the time of processing, and the dose reconstructor can apply correction factors to try to get a better estimate of the neutron dose. And this correction factor in the past we've used a lot is the geometry and the fading, these tracks fade as (indiscernible) time, and the ratio of energy, as I talked about.

Okay. Next slide.

Okay. So, this is a recent 2024 document. It's used to calculate and apply a correction factor to the already recorded NTA film, and so that this compares -- the correction factor is to compensate for the neutron energy spectrum that a worker was exposed to compared to the calibration in the lab of the NTA film.

Next slide.

So, now go down into some of the details here. I'm glad this is not the last talk of the day so everybody's good and awake. So, we have this OTIB in Section 3, it lists a brief history of NTA film, like I just recapped. And then the main parts are Section 4.1, which has a method of calculating. And

these are the four variables I'll be talking about because the end result is CF, correction factor, that we want to put in to Appendix C where the worker (indiscernible). To get there we have to go through some steps.

And so, these variables is the spectrum-weighted response, SWR, and that is the number of tracks per neutron. In other words, how many tracks, readable tracks, you get on a nuclear emulsion film under a microscope per neutrons impinging. And then you have the spectrum weighted dose equivalent, SWDE, and that is the rem per neutron per centimeter squared. In other words, what -- what did the body see as a function of neutron energy bind per each neutron for centimeter squared that impinged on the emulsion. And then you have the dose equivalent spectrum weighted response, DE SWR. And this is the tracks per centimeter squared per rem. So, this is -- and so, if you count field tracks, take it times the calibration (indiscernible) factor, then you have -- excuse me -- the dose received at that particular energy bin.

And like I say, the -- the bottom line is we want the CF, correction factor, and we use the IAEA 1990 technical report series. We used to call it Report 318 data. Now, this is useful, but then they come out in 2021, as I said, with Report 403. And it gives the energy, the neutron energy, the number of neutrons per energy bin. It doesn't give the SWR and SWDE. So, that's what -- we want to take the data, and like I said, we're not changing 408 -- or 403. We just want to take the response function and dose equivalent from 318 and apply it in two more columns in their list of neutron energy bins.

Next slide.

And we see that overall view here we have that -- we have three attachments in this OTIB. And Attachment A is two examples of common calibration exposure scenario give the reader an idea of how to apply these. And this is -- was useful. And then in Attachment B, it gives comparison of the results of this RD, risk determination, correction factor which (indiscernible). And then in Attachment C, as I've said, it gives you the tables of the important stuff for the DR that's doing it.

Next slide.

Okay. So, I want to look a little bit about the two different reports. 318 covers neutron energies from thermal, which is 0.025 eV up to 435 MeV. And generally, most of the exposures don't go over about 20 MeV except that accelerators, then you can get up to whatever the energy of the bin is. And they -- they use the upper energy value to label the energy bin. In other words, if you're -- if they're looking at energy bin 0.794 MeV to 1 MeV, they'll label that as the 1 MeV energy bin. Now, in contrast, Report 43 (sic) covers a little lower energy and a little higher energy, which really doesn't create a problem. But the problem is they use the lower energy bin to designate that energy bin. In other words, the 0.794 to 1 MeV would be called 0.794 MeV energy bin. So, yeah, they used a different nomenclature to talk about the title of the energy bin.

Now, to complicate that a little further, is that Report 40 -- 403 uses some of the same energy bins, but it -- they use different values for some of the other energy bins. So, that's what creates all the interpretation and interpolation problems that the -- that we'll briefly touch on.

So, next slide.

Okay. So, this is a recap of what I said in Section 4.1. It defines these variables we're talking about. And we have our neutrons (indiscernible), or the tracks for neutrons for SWR. SWDE, we have the rems for neutrons per centimeter squared. And DE SWR is the tracks for the squared per rem, and we -- fortunately, there's really only two variables. The first two, we see that the DE SWR is derived by dividing the SWR by the SWDE. If you work out the -- the units there, that (indiscernible) comes up in the rem, and so that's the rem per each energy bin. And so, you got, like, 100 energy bins or something.

And then the correction factor of course what we want, CF, and that's equal to the DE SWR of the calibration source used in the lab before the film goes out in the field, divided by that variable of the exposure source. So, that -- so, you find out what your energy, your calibration type is in lab, you go out and try to estimate what the exposure neutron spectrum is, and then you calculate the DE SWR of the calibration source and the exposure source and divide one by the other, and that gives you a correction factor. Of course, you're going to come out with a value that is say 1.0, 1.1, 0.9, 0.8, 1.5. So, that's what you would apply to the recorded dose. If a person had recorded dose for the month of 100 millirems, you had correction factor of 1.1, then you'd assign it 1.110-millirem in the dose reconstruction process. And if it's less than probably 1, or say 0.9, then you take it down to 0.9 and assign nine -- 90-millirem.

Okay. Next slide.

Okay. So, we evaluated Section 4.1 for Report 30-18 (sic), and I won't go into all the table details, but we reviewed that. We looked up the

tables in actually a copy of the report, looked up in the appropriate tables. And they had, for example, one example they gave was polonium-beryllium neutron source. And we calculated the see if it was correct. And we also determined the dose equivalent values for that source, and we checked that those calculations are correct in the OTIB. And we concur with the results in Section 4.1 of this OTIB and didn't identify any findings or observations. In other words, they went to back to the original Report 318, and we agree that the values listed in the OTIB matched those and are correct.

Next slide.

Okay. So, now we derive the neutron energy correction factor using that information and the -- the Report 43 energy bins, going to those energy bins --

(Whereupon, the was intermittent traffic noise audio interruption.)

DR. BUCHANAN: -- and then adding -- adding the response functions. So, we calculated the -- the SWR, which is -- tracks neutron and SWDE, which is rems for neutrons per centimeter squared using the 318 data. And these were correct in Table 4-4 -- they summarized in Table 4-4 of the OTIB. And then we calculated those same variables for the appropriate energy bins in Report 43 (sic). And then we looked at the interpolation results used to go from 318 to 403. And we looked at several conditions.

And so, the next slide.

There are two major conditions. A Condition 1 is whether the energy bins match. So, that's kind of a no-brainer. You just transfer it over. However, we'll look at Condition 2 in a minute, and we see that that's not as simple when they have condition -- when the energy bins don't match. So,

if the energy bins match, all we have to do is -- is shift the intervals because the energy intervals in 318 response functions are applied to one lower in 408 because the energy inter -- the neutron energy interval is titled with the lower energy rather than the higher energy.

For example, say that 318 lists the response function as 2.87 minus 4 tracks per neutrons at 1 MeV, that's to cover the energy bin 0.794 MeV to 1 MeV, you would assign that response function in the Report 40 -- 403 chart to 0.794 MeV because they count that as 0.97 -- 0.794 to 1 MeV. And so, we did that for -- the OTIB did that, and we checked for the response function and also for the dose equivalent function. Those are the two items that need to be added to the 403 data to be able to be used.

Okay. And then we'll go to Condition 2. What happens when the energy intervals are different than 30 -- 318 to 403? Okay. This is where it gets a little complicated. We see that the NTA response and dose equivalent functions. Two things we need to add to 403 from 318 interpolated from the 318 information to match the corresponding inter -- intervals in Report 403. Now, this interpolation process used to calculate the value of the cumulative function at each endpoint of the energy bin in Report 318, and they fit a monochromatic cubic spline to the cubic -- to the cumulative function at the bin endpoints. That's all to say that it's a smooth fit to discrete points.

And then they took the derivative of this cubic spline function to calculate the underlying functions in that energy bin. And then that was between certain energy points. But then to go to 403, we needed to integrate that function over the new energy bin interval and divide by the width of the energy bin. So, that we wanted to use the energy bins in

Report 403 now. And so, they did that. And they -- the results of all this work is summarized in Table 4-5 of OTIB-92.

Okay. Now, for example, so let's say that Report 318 missed a dose equivalent function from 4.09 to the (indiscernible) rem for neutrons per centimeter squared at 10 MeV. That's for the energy interval of 7.94 to 10 MeV. Use the upper value in their nomenclature. So, then we looked at Report 403, and we see not only did they use the lower energy bin as the nomenclature, but they also do not have as many energy bins as 318. 318 or -- at 10 MeV, it goes 10 MeV to 12.6 MeV, 12.6 to 15.8. So, it has two energy bins there. However, 403 uses one energy bin, 10 MEV to 1.58 MeV. So, we have to interpolate over those two energy bins from 318 to be able to derive a value for 4 -- for 403. And we see that then at 10 MeV then we have a dose equivalent function 4.15 minus 8 neutrons per centimeter squared for the interval of MeV to 15.8.

Now, you see it doesn't change a lot. That's only about 1½ percent change from 4.09 to 4.15. So, it -- it isn't a lot of change, but it's something that NIOSH felt they need to refine, so they went -- when they interpolated for these different energy bins, it would be as close as possible.

Okay. So, we can go to the next slide.

Okay. So, we evaluated Section 4.2 for the Report 43 data. And again, I won't go -- we pulled up and downloaded in Report 403 and looked at it. And -- and it shows -- this slide shows some details, but we won't go into all of it. We use the tables from 318 for the dose equivalent and the neutron or the NTA film response. We verified the values in Table 4 -- 4-4 and Column 2, 4 of 92, and we agreed with them. We reviewed the NTA

response dose equivalent function fitted to the spline plots in the spreadsheet. Fortunately, NIOSH sent us some calculational spreadsheet and while we didn't go through and do all the re-calculations, the differentiation, integrals, and everything, we found that the interpolations fit well with the data, and they did not show large deviations from norm. And just like I said, you know, it was a small percent when they changed energy bins, but we didn't see anything that stuck out that was an issue. And so, we concur with the math as a result in Section 4.2 and didn't identify any findings or observations. Okay. Next slide.

Okay. Now, there is a Section 6 in this OTIB that we reviewed and essentially find it gives an accurate -- it's kind of in the middle of the OTIB, but it gives an overview of kind of what I presented the first of the OTIB. And we found that it gave an accurate overview of the previous sections. And we had no findings or observations in Section 6.

Okay. So, then we'll go into three attachments. We see that Attachment A, like I stated earlier, lists some common calibration exposure scenarios. And these were helpful. We evaluated the calculations technical aspects of at least three examples in this attachment. We found them helpful, concur with the math, and results, and we don't have any observations or findings.

Now, B is benchmarking spectrum-weighted response methods of published literature. So, to check and see if some of the results were in line with what's been published -- previously published, they present in Attachment B, several published documents analyzing NTA film response of various neutron energy spectrum. And the -- these benchmarks indicated

that the estimated dose from the procedure 92 -- OTIB-92, resulted in predicted doses within less than plus or minus 200 on the factor of 0.5 to 2.0. Now, at first you might think, oh, that's not good. And that made may be not good in X-ray world or gamma ray world, but neutron dosimetry, this is not a bad agreement considering all the different variables that are in locations and stuff that this was done by.

And so, we reviewed B and concurred that the method in this OTIB produces compatible results, not identical, but compatible results to those cited.

Okay. Next slide.

Okay. This is the crux of the matter. I went through all this. A summary of the various SWR and SWDE values. Table C-1 provides the most important data in the OTIB for dose reconstructions, and they -- they summarized these three variables. Now, they don't give the correction factor because they don't know what the exposure and the -- and the -- the calibration spectrum is, but they give you those three variables that you can calculate for the correction factor. So, they give you SWR and SWDE. Those are the two variables that change the neutron energy. And so, you can calculate the DE SWR and then take a ratio of those, can find out what the correction factor is.

We verified the samples of the recommended values and found them correct and had no findings or observations in Attachment C.

Okay. Our conclusion is we reviewed the methods in this OTIB and the relevant data in the Report 318 and 403, evaluated the derivation of the variables we have been talking about, and verified various numerical values

in all the tables, 4-1 through C-1. We found that they use technically sound methods, present very complex subject in a concise and illustrative manner, and we found that they present useful enough data as summarized in C-1 for the dose reconstructor. However, did have one observation.

Next slide.

Okay. There's limited application of the NTA correction factor, we feel, that table C-1 provides a wider range of neutron exposures that potentially can be present at DOE facilities, along with the variables we talked about to determine the NTA correction factors. Usually, the neutron energy spectrum of source -- a source is used to calibrate neutron detector at a facility is usually fairly well known and a reasonable degree of accuracy has been studied in different location and stuff like that, PUVE source or whatever. However, in many cases, neutron energy of the exposure field varies. Even if the neutron energy sector is measured at several locations in the field, the actual neutron spectrum to the worker exposed can be influenced by such factors as the list in the following slides.

Okay. So, influencing factors is that the neutron source, especially if you're working around a high-end geo accelerator or most any accelerator, change in voltage and target material at the accelerator will change. So, even if you measured it for one target, you'll change it for another target or (indiscernible) accelerating energy. And the shielding material, the thickness layer and the angles of neutron can verse the shielding influence neutron energy spectrum. Because neutrons interact different with hydrogenous material, which is waterproof and cement, earth, than it does steel (indiscernible). And so, the access ports, you can have a moderated

neutron field at one place and, you know, several inches away at the seam or a void or a -- an access port where you put the samples in and out can greatly increase in energy at that point. So, you have spot -- spots of higher energy neutrons.

Also, especially at high energy accelerators, you have sky shine, which is the neutron reflected back from the atmosphere. And that changes in ground shine, which is projecting neutrons up from the ground but angled from source. And also, probably most importantly is the backscatter neutrons from the material behind the worker. So, if he's working in front of a neutron source reactor or accelerator target and the material behind him is wood, it would be completely different neutron spectrum than if it -- concrete or steel or some other material.

Next slide.

So, the changing parameters, we see that exposure parameters can change significantly as the worker moves around an area. And further complicated when attempt to recreate neutron dose and exposure situations took over 40 up to 80 years ago when the NTA film was first used. And some parameters derived from using neutron correction factor can be determined with greater accuracy and actually the neutron exposure spectrum can be known in the field.

Next.

Okay. So, our evaluation recommendation is that it should be -- this correction factor should be used with caution, because it could lead to a false sense of being able to derive and assign neutron doses of greater degree of accuracy than is warranted. We showed the, you know, calculations varied

by 1.5 percent for the one of the variables put out in the field. When you measure neutron energy spectrum and dose, it's going to vary a lot more than that. So, you don't -- you've got to keep your overall picture in mind. And so, we recommend that given the uncertainty that only a spectrum correction factor greater than 1 be applied to a worker's recorded neutron dose, unless it can be very well shown that, you know, it's reasonable to assume the exposure conditions are well-documented. And of course, this would require, just like discussed in previous reports, should be determined if this is warranted on a case-by-case basis.

Next slide.

So, summary of our evaluation. We had no findings. It was very well written and had one observation, which were just discussed about the limited application.

Okay. Open for questions.

CHAIR BEACH: Thanks Ron. Very complicated subject matter, if I might say. I know that NIOSH has a -- a response, but any subcommittee members have questions or thoughts?

MEMBER FRANK: That's to say --

MEMBER ZIEMER: This is --

MEMBER FRANK: -- (indiscernible) --

MEMBER ZIEMER: This is Paul. I have a comment.

CHAIR BEACH: Okay. Go ahead, Paul.

MEMBER ZIEMER: Yeah. Well, first of all, Ron, very good summary on a very complex topic. You -- you cover neutron dosimetry issues pretty extensively, and that was very well done. And of course, your conclusions

are what one would expect for neutron dosimetry. But I think you -- you certainly showed both what NIOSH is doing and what you guys are doing to -- to verify. It's very well done. Thank you.

And -- and incidentally, I -- I'm off now for a bit, and I'll be back.

CHAIR BEACH: Okay. Thanks for the comment, Paul, and we'll see you when you get back.

DR. ROBERTS: Okay. Josie, I did confirm what constitutes a quorum. We're going to have to pause this meeting because the quorum is four.

CHAIR BEACH: Okay. I --

(Whereupon, there was an audio interruption by an unmuted attendee.)

DR. ROBERTS: I'm sorry, I -- I thought I heard something. So, what would you like to do? Do you want to -- I believe Paul had said 30 minutes.

CHAIR BEACH: That's what he indicated, yes.

DR. ROBERTS: Okay. So, what we could do is just reconvene at that point and see if he's back.

CHAIR BEACH: Okay. That sounds good. And maybe someone could let him know that we're offline until he comes back. I don't know if that's possible.

(Whereupon, there was an ongoing traffic audio interruption.)

DR. ROBERTS: Well, I think he assumed that we would -- you know, he would just rejoin and --

CHAIR BEACH: Right.

DR. ROBERTS: -- continue --

CHAIR BEACH: Yeah. I thought -- I think he thought we would

continue though, so. Okay. Yeah. I say take another 30-minute break and come back, see where we are.

DR. ROBERTS: Okay. Great. Okay. So, --

CHAIR BEACH: Thank you.

DR. ROBERTS: -- 3:15 -- 3:15 Eastern.

CHAIR BEACH: Okay. That sounds good.

(Whereupon, a break was taken from 2:49 p.m. EDT until 3:15 p.m. EDT.)

DR. ROBERTS: And let me do roll. Beach?

CHAIR BEACH: I'm here.

DR. ROBERTS: Bronson? Oh, I'm sorry, he's out. Frank?

MEMBER FRANK: Here.

DR. ROBERTS: Valerio?

MEMBER VALERIO: I'm here.

DR. ROBERTS: Okay. And of course, I heard that Ziemer was back, so great. Over to you, Josie, to continue.

CHAIR BEACH: Thank you. Thank you. And thanks for coming back, Paul.

We can go ahead and go back and finish up 92. Did NIOSH want to present their -- their response to the observation?

DR. ULSH: Oh, yes. If Ron is done with his presentation, then, yes.

CHAIR BEACH: Yeah. I think, Ron, you were done, weren't you or not? Did I miss something?

DR. BUCHANAN: No, I'm done.

CHAIR BEACH: Yeah, that's what I thought.

NIOSH response to OTIB-0092 Observation

DR. ULSH: Okay. Lori, --

CHAIR BEACH: Lori, do you mind putting up the -- oh.

DR. ULSH: Right. Exactly, Josie. I was asking Lori to pull up the BRS.

CHAIR BEACH: I was. Thank you.

DR. ULSH: So, on a Friday afternoon in the summer, you all are relegated to me, which is the third team here. Mark Rolfes is on leave today and Alek had to leave, so you get me. But I think the response is easy enough that I can field it for us as soon as Lori gets it up.

(Whereupon, there was an audio interruption.)

DR. ULSH: It's coming. Okay. If you could open up, I guess, the attachment. And by the way, when you see my name in the BRS, that's just because I'm the BRS monkey; that doesn't mean I wrote it. That just means I know how to put it into the BRS, so. Oh, wait, just --

CHAIR BEACH: The same goes for Kathy, I'm sure.

MS. BEHLING: I was about to say that, yes.

DR. ULSH: And this attachment is actually the one that Ron wrote, or it's not the right attachment. Yeah. The response there, is that what's attached there when you click on the response to SC&A's review, --

CHAIR BEACH: Right.

DR. ULSH: -- the one you just opened? Well, that attachment is wrong. So, it looks like the monkey screwed up. I will have to load that into the BRS and take down that one. But I can tell you what our response is. And it's basically that we agree with Ron's observation. And we will not use

a DCF less than 1. So, it's pretty easy.

CHAIR BEACH: Yeah, that was very easy. And I thought that opened when I went and looked at it, but maybe not.

DR. ULSH: Well, I --

MR. SIEBERT: Hey, Brant. I'm sorry, this is Scott. I just wanted to let you know, it is there. You have to -- the response is underneath that. That's the attachment on Kathy's. There is an attachment.

DR. ULSH: Well, --

MR. SIEBERT: -- response to SC&A.

DR. ULSH: Yeah.

MR. SIEBERT: I'm looking at it right now. I know it's -- I know it's there.

DR. ULSH: Well, I can't explain it, because that's what I see too, but when Lori clicks on it, it opens up Ron's report. So, I don't know.

MS. MARION-MOSS: No, this is Lori. Is she (audio distortion). Can you hear me? This is Lori.

DR. ULSH: Yes. Yes, Lori.

MS. MARION-MOSS: The attachment that I just shared is the response (audio echo) to the observation. I apologize, (audio distortion) response to the observation. It is (audio distortion) report, as Brant indicated. I stand corrected.

DR. ULSH: So, I'm going to --

(Whereupon, the was an audio interruption.)

DR. ULSH: -- have to fix that. Somehow or another I put in the wrong report when I meant our response to Ron's report. That's what it

says, what our response is, so.

CHAIR BEACH: Okay. So, that --

MR. SIEBERT: Lori, Lori, --

CHAIR BEACH: -- will be added?

MR. SIEBERT: Based on -- Lori, I -- I'm sorry. This is Scott. Just are -- are did you hit the little plus to open up Brant actual response and then the attachment to his response?

DR. ULSH: Yes.

MR. SIEBERT: Because that's what I'm seeing the actual response being.

CHAIR BEACH: That -- I see that as well. Yep. You can see it there in the -- on the page. Oop, you're going past it.

MS. MARION-MOSS: Yeah. Thank you, Scott.

MR. SIEBERT: Always here for you.

DR. ULSH: Oh, hey, there it is. Look at that.

CHAIR BEACH: It takes a village and a team.

DR. ULSH: I guess so, especially on a Friday in summer. Okay. So, thank you. That's the cover page. Can you, yeah, roll down just a little. There's Observation 1, Observation --

MR. SIEBERT: Brant? Brant? I -- I -- I hate I hate to be a pain since I did not announce because I wasn't planning on speaking at all, this is Scott Siebert with the ORAU Team just for the court reporter. So, there's not just this random Scott in the transcript.

DR. ULSH: All right.

MR. SIEBERT: And then --

DR. ULSH: Thank you, Scott.

MR. SIEBERT: Sorry about that.

DR. ULSH: Oh, goodness, now it's -- okay, here it comes. I think it's coming. Oh, oh, no, it's gone. Boy, it seems like we've had just about every flavor of technical and logistical difficulties today.

MS. BEHLING: Excuse me, this is Kathy Behling. If you want, I believe I have it on my screen. I could pull it up for you if -- if you're still interested in doing that. I can attempt to.

DR. ULSH: Give us --

MS. BEHLING: Actually, --

DR. ULSH: -- 30 seconds, because I think Lori's almost back.

MS. BEHLING: Okay.

DR. ULSH: If you're seeing what I'm seeing. Okay.

MS. BEHLING: Yep.

DR. ULSH: The document is open. We're just getting bigger. There it is. Okay. So, if we can -- there's Ron's observation, so hopefully, our response follows. There it is. Okay.

So, the money statement there is in the second paragraph, right above the conclusion, we acknowledge -- you know, we agree with -- with Ron's observation, and there it is, limiting the method of OTIB-92 to neutron dose correction factors equal to or greater than 1 would be the most conservative and --

(Whereupon, there was an audio interruption.)

DR. ULSH: -- favorable. We agree.

CHAIR BEACH: Okay. That was easy enough. Well, after we got

there, any --

UNIDENTIFIED SPEAKER: (Indiscernible) actually.

CHAIR BEACH: -- comments or questions? Yeah. Any comments or questions, subcommittee?

MEMBER BEACH: None for me. Frank.

CHAIR BEACH: Okay. Thank --

MEMBER VALERIO: None from --

CHAIR BEACH: -- you.

MEMBER BEACH: -- me. Loretta.

CHAIR BEACH: Great.

MEMBER ZIEMER: None for -- none for me -- Paul -- at this --

CHAIR BEACH: Thank you, and --

MEMBER ZIEMER: -- time.

CHAIR BEACH: -- SC&A, you're in agreement with this conclusion and, I'm assuming, ready to close this out?

DR. BUCHANAN: This is Ron, --

MS. BEHLING: (Indiscernible) --

DR. BUCHANAN: -- yes.

MS. BEHLING: Yeah.

CHAIR BEACH: Okay. Then that is unanimous. And 92 is closed out. Now, Kathy, you need to pick between 92 and 71 or else present both of them in August.

MS. BEHLING: I think 92 will be quite a challenge, but --

CHAIR BEACH: Yeah, that's kind of what I'm thinking. We'll save -- let's save 92 to December.

MS. BEHLING: Right.

CHAIR BEACH: Okay.

MS. BEHLING: And Josie, if you don't mind me asking, could we perhaps rearrange the schedule a little bit here?

CHAIR BEACH: Sure. What would you like?

MS. BEHLING: Okay. I was hoping -- Amy has to disconnect at four o'clock, so perhaps she could do PER-69.

Amy, are you okay with that?

MS. MANGEL: Yeah, that's fine with me.

MS. BEHLING: Okay. And then we'll do OTIB-34 after that, because we want to get that in before 4:30, and then we'll go to Steve -- Steve Ostrow's, because I would like to make sure that we get that one in also. Are you --

CHAIR BEACH: Yes, I --

MS. BEHLING: -- okay with --

CHAIR BEACH: -- agree.

MS. BEHLING: -- that?

DCAS-PER-069, Rev. 0 "Jessop Steel Company" Presentation

CHAIR BEACH: Yes, absolutely. So, we're moving on. And 69, Jessop -- Jessop Steel?

MS. BEHLING: Yeah, PER-69. Let me see if I can find this. Here we go. Okay. Are you seeing my screen?

CHAIR BEACH: Yes.

MS. BEHLING: Okay. Go ahead, Amy.

MS. MANGEL: Okay. So, I will present our review for PER-69 for Jessop Steel Company. The PER was issued to address changes as a result of Revision 1 to the TBD for Jessop Steel Company, which is Appendix BL of TBD-6000.

The site is located in Washington, Pennsylvania, and made stainless steel piping for Fernald, and it used uranium-contaminated nickel scrap. There was a request for 2 tons of nickel scrap to be sent to the site. That request was dated December 2, 1952. One -- 1 ton was sent that first week of December, and the second ton was believed to be sent soon after. The material was nickel trays from Lake Ontario Storage Area, and they likely originated from Harshaw Chemical Company.

The site also shared an unknown number of uranium plates -- plates for DuPont on March 2, 1954.

There is no residual contamination period after March of 1954 due to the low potential for contamination. The recovery period runs from December 1, 1952, through March 31, 1954, and again, no residual period after -- after March 1954.

Revision 1 came about. It included changes based on TBD-6000 revisions and the changes were also to make the dose estimates more consistent with the -- the existing techniques. Job categories were eliminated for the internal and external dose estimates and the inhalation intakes increased. SC&A had not previously evaluated the TBD Appendix BL, so as part of our review for PER-69, we also included an evaluation of the document for its dose reconstruction guidance.

For occupational internal dose, the -- the nickel activities, NIOSH

didn't find any data for airborne uranium contamination at the site. However, Huntington Pilot Plant operations were similar to what was done at Jessop, so NIOSH used the 95th percentile airborne nickel concentrations from Huntington Pilot Plant as part of the -- the dose reconstruction, and they assumed 1 percent uranium by weight, assumed it was 2 percent enriched uranium, assumed the work took a full week, which was assumed to be 44 hours, and this resulted in a total inhaled activity of 622 dpm.

For the occupational internal dose after the nickel activities, TBD-6000 was used to calculate the surface contamination level based off of the air concentrations. It was assumed that the airborne contamination was allowed to settle for 44 hours, resulting in a 1,399 dpm per square meter. And after including the resuspension factor, the airborne concentration would be 0.014 dpm per cubic meter.

For occupational internal dose from the plate-sharing activities, they also use TBD-6000, Table 7.5 for cutoff, milling, and slotting as a claimant-favorable assumption. It was believed that these activities would produce a higher airborne activity than shearing. Used the 95th percentile of the distribution and assumed that the shearing took place for one full day of 8.8 hours, resulting in a total inhalation of 6,706 dpm.

For occupational internal dose, after the plate shearing, TBD-6000 was used to calculate the surface contamination based off of air concentration again. The airborne contamination was assumed to settle for 24 hours or three full shifts. This resulted in a contamination level of 41,148 dpm per square meter, and when adding that to the surface contamination from -- from shearing, it was a total of 42,547 dpm per square meter. And after

including the resuspension factor, the airborne concentration would then be 0.425 dpm per cubic meter.

For ingestion, NIOSH calculated the rates using NUREG/CR-5512, did not use TIB-0009. The time frame at Jessop was significantly less than the 30 days that is assumed in TIB-9. The ingestion rates are given in a table in Appendix BL, Table 2.

For SC&A's review, we were also unable to identify any airborne uranium data at the site, and we agree with NIOSH's determination to use the Huntington Pilot Plant TBD. We confirmed the total inhaled activity of 622 dpm, and the surface contamination level and the resulting resuspended airborne concentration.

Observation 1: The assumed exposure time may be underestimated. So, there's a memo dated December 2, 1952, which requested 2 tons of nickel scrap be sent to Jessop. There's a weekly progress report dated the week of December 5, 1952, which states that 1 ton was sent to Jessop, and NIOSH assumes that the second son was sent soon after the first ton. The time period for the dose assessment is one week. If 1 ton was sent during the first week, December 5th -- the week of December 5, 1952, and the second ton was sent after, it could be reasonable to assume that the total time for the scrap-nickel operations was two weeks. We reviewed some operational reports and didn't find any information confirming when the second ton of material actually made it to the site. So, we believe in the absence of definitive information, stating that nickel-scrap work at Jessop didn't proceed until both tons of material were received, it -- it would be more claimant favorable to assume that the work took two weeks instead of

just one.

For the plate shearing activities, we agree with NIOSH's assumptions of a period of 24 hours for the settling of the airborne contamination, and we confirmed the surface contamination and airborne concentration levels as a result.

For our Observation 2, additional information should be included to use surrogate uranium operational data and modeling. NIOSH has stated the air concentrations associated with uranium cutoff, milling, and slotting from Table 7.5 and TBD-6000 should be higher than what you would expect from shearing, and we just request additional information to support that assumption. It wasn't exactly clear why that would be the case.

Observation 3: Some clarification is needed for the assumed work hours. It's not clear how the values in the other work hours column of Table 1 in the TBD were calculated for December 1952 and the first three months of 1954. Assuming 8.8 hours per work day, we just weren't able to match -- match the values in that table, so we just request some clarification on how those were determined.

For occupational external dose, there was no external data at Jessop, so NIOSH used TBD-6000. NIOSH adjusted the dose rates for uranium metal to reflect the composition of the nickel scrap. That was 1 percent uranium, 2 percent enriched. Excuse me. The specific activity of the 2 percent enriched uranium is 1200 picocuries per milligram, so therefore, the nickel-scrap activity is assumed to be 12 picocuries per milligram. And NIOSH divided the specific activity of the nickel scrap by that of natural uranium, and this produced a factor of 0.0175 that was used to reduce the

TBD-6000 dose rate.

For external dose from uranium, the highest 1-foot photon dose rate from Table 6-1 of TBD-6000, was 2.08-millirem per hour. The 1-foot beta dose rate is assumed to be ten times higher, and the contact beta dose rate was 230-millirem per hour. And then NIOSH applied the reduction factor previously discussed of 0.0175. So, those dose rates then become 0.036-millirem per hour for the 1-foot photon dose rate, 0.36-millirem per hour for the 1-foot beta dose rate, and 4.04-millirem per hour for contact beta dose rates.

NIOSH cited a survey from Harshaw Chemical for a surface dose rate of 0.06-millirem per hour gamma and 1.94-millirem per hour beta-plus gamma, so NIOSH's assumed dose rates appear to be comparable and favorable, and the assumed exposure time for this is the 44 hours in December of 1952. For the uranium plate shearing activities, TBD-6000, Table 6.1 was used, and it was assumed that the workers were exposed for half of the day. NIOSH used the surface contamination levels and dose conversion factors from Table 310 of TBD-6000, and those were applied to the dose rates -- applied these dose rates to the time periods between the uranium operations.

So, SC&A also did not find any external data for Jessop. And we agree with NIOSH's determination to use TBD-6000. We were able to match the factor of 0.0175 that NIOSH had calculated as well.

For Observation 4, clarification for adjustments for shielding and external dose modeling. So, in Revision 0 of Appendix BL, the difference in atomic numbers of nickel and uranium was also factored in during the

calculation of the -- the reduction factor. And so, previously the -- the factor was 0.0549. And in Rev. 1 it's 0.0175. So, we just request clarification on how it was determined that this additional factor accounting for the difference in atomic number was no longer necessary when calculating this -- this factor.

We verified the calculated 1-foot photon dose rate, the 1-foot beta dose rate, and contact beta dose rate. The assumption that the operator would spend half of their work day at a distance of 1 foot from the metal, is in accordance with TBD-6000.

For residual contamination, it potentially existed between the uranium operations and after. The uranium work was limited, so therefore, the potential for contamination to remain was low after it -- the potential for contamination to remain after operations was low, so doses are not assigned after March 1954. And we agree with this. These doses would be extremely minimal from a dose reconstruction perspective.

For occupational medical dose, there's no site-specific guidance. So, OTIB-6 is used for assigning medical dose, and we agree with this guidance. So, the PER selection criteria: All completed claims that had POC of less than 50 percent. This was eight claims. And all eight claims were re-evaluated using Rev. 1. They all had a POC less than 45 percent. And we believe that NIOSH's selection criteria, you know, captured all potentially affected claims, and the PER was conducted in a timely manner. Rev. 1 was issued in October 2015, and the PER was issued in April 2016.

For evaluating some of these cases, SC&A recommends selecting however many cases is necessary to assess the changes that were

introduced in Revision 1 of Appendix BL, so, however many cases it takes to evaluate the internal dose, external dose, and the residual -- the residual period between uranium operations for the internal and external dose associated with that as well.

Any questions?

CHAIR BEACH: Thank you, Amy. Good reporting.

Subcommittee, anybody have any questions?

MEMBER FRANK: No. It was a good presentation. This is Arthur Frank. Thank you.

MEMBER VALERIO: This is Loretta. No questions.

MEMBER ZIEMER: And this is Paul. I have no -- no questions. Good presentation.

MS. MANGEL: Thank you.

CHAIR BEACH: So, Kathy, do -- do we normally close out the observations before we move into the cases?

MS. BEHLING: No, no, we --

CHAIR BEACH: No, we don't.

MS. BEHLING: -- get the cases. Yeah.

CHAIR BEACH: Okay. Right. So, between one and three. And I think that -- that completes that one for today with no questions.

ORAUT-OTIB-0034, rev. 04 "Internal Dosimetry Co-Exposure data for Oak Ridge National Laboratory" Presentation

MS. BEHLING: Right. Okay. As I had suggested, if we can go on to OTIB-34, which is Rose. Are you prepared to do that?

MS. GOGLIOTTI: Yes. Just give me a second to pull this up. Can you see my screen? Everybody hear me?

CHAIR BEACH: Yes.

MS. GOGLIOTTI: And it's just the slides, not presenter mode, right? Okay. Hi, this is Rose Gogliotti, and today I'll be presenting SC&A's review of ORAUT-OTIB-34 and that is Revision 4.

Let me start with a brief overview of the document. 34 is currently titled "Internal Dosimetry Co-Exposure Data for Oak Ridge National Laboratory," and this is Revision 4, which was issued September 1st of 2020. It was previously titled "Internal Dosimetry Coworker Data for X-10," and I'll speak more about that nomenclature change in a moment.

The purpose of this document is to provide guidance for calculating and assigning co-exposure intakes for unmonitored Oak Ridge National Laboratory workers, based on data from workers with similar exposure potential. In other words, when a worker's individual monitoring data is unavailable, this segment provides the methodology for estimating internal dose.

SC&A was tasked with reviewing Revision 4 on July 28th of 2025, and we issued our review in January of 2026. Before I get into the substance of our current review, I think it's helpful to understand the history of the Board's involvement with this document. On behalf of the subcommittee, SC&A first reviewed OTIB-34, Revision 0 back in 2007, and that review identified four findings. And I can report that all four of those findings were resolved already by the subcommittee.

And then we reviewed Revision 1 in 2013, and that review identified

an additional four findings. And of those findings, Finding 1, 2, and 4 were closed by the subcommittee. Finding 3, which some of the transcripts and documentation also referred to it as OTIB-34-7 -- because it's the 7th finding associated with the document -- and that was left in abeyance. And I'll come back to that in a moment. And I also want to note that due to the timing of our 2013 review and the subsequent subcommittee discussions, some of the changes that appeared in Revision 2 were actually evaluated as part of the issues resolution process with the subcommittee.

So first, let's start with Finding 3. And this has been sitting in abeyance since it was last discussed at the August 2014 subcommittee meeting, and this finding dealt with the adequacy of guidance for finding the 95th percentile intake values for unmonitored workers. At the time that it was placed in abeyance, the subcommittee had agreed on very specific wording to be incorporated into an implementation guide, but that documentation had not been formally published. I did look into this, and since then, because IG-006, Revision 0, which is titled "Criteria for the Evaluation and Use of Co-Exposure Datasets." It was issued on March 6th of 2020, and SC&A reviewed that implementation guide in the context of this finding and confirmed that the agreed upon text regarding the use of the 95th percentile was indeed included, and that appears in Section 3.2 of that document. Accordingly, I -- SC&A is recommending that we close this finding.

Okay. So, our review focused specifically on changes that were introduced since our prior review. So, that's subsequent to Revision 0 in 2007 and Revision 1 in 2013, and then all the subsequent subcommittee

discussions that followed. So, this review kind of supplements those earlier reviews. It doesn't replace them, and it only addresses new content, not things that have already been resolved by the subcommittee. I also want to note that the review does not address Report-90, Revision one, which deals with exotic radionuclide monitoring at ORNL in the isotopes division, and that document is currently under active discussion with the ORNL work group, so we consider it outside of the scope of this particular review.

So, now let's talk about what actually changes in Revision 4. According to the document's publication record, the revision is a complete rewrite and incorporates intake rates for Type SS plutonium. However, when I did a direct comparison of Revision 1 and 4, we found that the vast majority of the guidance remained completely unchanged, and there were a few substantive changes that fell into three areas, either related to Type Super S plutonium, the handling of additional radionuclides, and basic nomenclature and formatting changes. So, I'll walk through each of those.

The most significant technical change in the revision was the addition of guidance for Type Super S, or Type SS Plutonium.

And just as a refresher, historical studies have demonstrated that in some cases, plutonium is removed from the lungs more slowly than Type S model predicts, meaning that organ doses over time were being underestimated using the Type S model absorption parameters alone. And that is a phenomenon that we call Type SS, or Super S. And the biokinetic model for evaluating how inhaled, very insoluble Type SS plutonium is deposited, retained, and removed from the body is described in OTIB-49 Revision 2. And that OTIB has already been reviewed by the subcommittee.

Prior revisions of 34 that SC&A reviewed did not include guidance for that. It simply noted that it should be considered without providing any corresponding co-exposure model. So, this revision did add those.

So, to accommodate this Type SS plutonium, Revision 4 added two new tables in a series of new figures. Table 6-8 and Table A-12 were both added to provide co-exposure model for the Type SS plutonium, including intake period and rates at the 50th and 84th percentiles, along with geometric standard deviations. And consistent with the method used throughout OTIB-34, NIOSH determined that those (indiscernible) were by dividing the 84th percentile intake rates by the 50th percentile values and SC&A independently confirmed those calculations.

They also added figures A-28 through A-31, and those were added to show the model fit for Type Super S material across each of the subset of years in intake periods, and then a composite graph is shown in figure A-32. We reviewed all those tables and figures and found the model fits to be reasonable in all cases. I will note that the Type SS figures do visually look different, and by "different," I mean different formatting from the other figures in the document. And that's because they were produced using the internal dosimetry tool or IDOT rather than IMBA. And IDOT was approved by the Board for use during the 2021 Review of OTIB-49. So, that difference in appearance is expected and entirely appropriate.

Okay. The second area involves how Revision 4 handles additional radionuclide. So that's beyond plutonium, uranium, Americium-241, and Strontium-90. In the earlier revision, ORNL parameter air monitoring data was used to develop isotope concentration ratios for each -- or for the other

radionuclide relative to Strontium-90. And Revision 4 changed that approach and now directs dose instructors to use intake mixture ratios from the latest revision of OTIB-54. And that covers fission and activation products assignments and instructs that OTIB-54 guidance applies to workers in the reactor division and the tank farm areas and explicitly does not apply to workers from isotope separation division or isotopic development center. And we agree that using OTIB-54 for fission or activation product mixtures in the reactor division is more appropriate than relying on the perimeter air monitoring data. However, we did have a concern regarding the tank farms. And that brings me to our first finding.

We question the applicability of the OTIB-54 data to the tank farm area. OTIB-54 itself, in Revision 2 explicitly states that it does not apply to situations where the radionuclides have been purposely extracted and concentrated or where waste handling operations cause significant alteration to the source term, and that's the source term that the workers were actually supposed to.

And we note that in OTIB-54 has been revised twice since 2014, but that exclusionary language has remained unchanged throughout. And the tank farms at ORNL accepted and stored waste from a range of chemical separation operations, and that includes business phosphate, REDOX, PUREX, THOREX, and fluoride chemical processes. Other research involved isolating americium and curium from irradiated fuels, and all these processes are designed to alter the source term, thus impacting the representativeness of the OTIB-54 data on the waste being stored. So, given that OTIB-54's own stated scope excludes the kinds of activities with the waste being stored

at the tank farms, we believe that NIOSH should clarify or at least justify its application to the tank farm areas.

Okay. And then the third area of change, which is more administrative than anything, Revision 4, replaces the term "coworker" with "co-exposure" throughout the entire document. And that's part of a broader programmatic change across all EEOICPA documentation. And that stems from an agreement reached during the December 2019 joint Savannah River and SEC Issues work group meetings. Similarly, the name -- oop, sorry -- X-10 was changed to ORNL for the consistency with DOE site names. And these are changes in terminology. They have no effect on the doses being assigned.

I also noted that the date ranges in the tables were expanded for clarity. So, the earlier revisions use shorthand. So, for example, it used a range 1951 through 1953 and Revision 4 now spells out the full date range. So, January 1, 1951, through December 31, 1953. And that reduces ambiguity, in particularly the transition years, but has no real effect on doses.

Okay. So, to summarize our conclusions, despite being characterized as a complete rewrite, we found that most of the guidance was materially unchanged from prior revisions. No co-exposure model values were altered beyond the addition of the Type SS plutonium model, and SC&A found that the Type SS modeling to be reasonable and consistent with the methodology used for other radionuclides in OTIB-34.

SC&A does recommend two actions for the subcommittee's consideration. First, we recommend closing Finding 3 since the agreed upon

language in the implementation guide has been included. And then secondly, as part of Finding 1, which would be, like, equivalent to OTIB-34-7 -- or not 7, sorry, 9, we are requesting that NIOSH clarify and provide justification for applying OTIB-54 to the tank farm areas, given the apparent conflict with the document-stated scope.

And that concludes my presentation. I'm happy to take any questions.

CHAIR BEACH: Thanks, Rose. That was really helpful, your background information on this one, since it does have quite a history. I found it to be helpful.

Any questions? Comments?

MEMBER FRANK: None for me. Frank.

MEMBER VALERIO: None for me. Loretta.

CHAIR BEACH: All right. Are we in agreement with SC&A to close Finding 3? That is in abeyance. I'm not --

MS. GOGLIOTTI: (Indiscernible) --

CHAIR BEACH: -- hearing anything. Go ahead. Arthur?

MS. GOGLIOTTI: I was just saying, it's the end of the day; everybody's out.

CHAIR BEACH: Yeah. If I hear no objections, I'm assuming we can go ahead and take SC&A's recommendation to close --

MEMBER FRANK: I'm sorry. I hit a wrong -- yeah, I hit a wrong.

CHAIR BEACH: No.

MEMBER FRANK: I hit a wrong button. No -- no objections. You can go ahead.

CHAIR BEACH: Okay. So, we're in agreement to close 07, which is

No. 3 in the old document. Okay. I am --

MR. BARTON: SC&A's in agreement.

CHAIR BEACH: Thank you.

(Whereupon, several attendees speak simultaneously.)

MEMBER ZIEMER: Josie?

CHAIR BEACH: Yes. Hi, Paul.

MEMBER ZIEMER: Hi. I just wanted to point out you were talking there, this last one was on Oak Ridge, correct?

MS. GOGLIOTTI: ORNL.

CHAIR BEACH: Yeah, yeah.

MEMBER ZIEMER: And so, I'm conflicted on Oak Ridge, so when -- when Rose started -- when Rose started, I turned my phone -- my phone sound off and --

CHAIR BEACH: You're right.

MEMBER ZIEMER: -- I stopped -- I stopped watching, --

CHAIR BEACH: Okay.

MEMBER ZIEMER: -- but I kept -- I kept my screen on. I just occasionally glanced over to see when -- when you got to the finish point, but I -- I --

CHAIR BEACH: I -- yeah. Thanks for that clarification. We appreciate what you -- that you disconnected from the -- the conversation.

So, we are all in agreement, and we can move forward.

And I'm assuming, NIOSH, Brant, if you have anything, you'll step up and make comments, correct?

DR. ULSH: That is correct. And I will --

CHAIR BEACH: Okay.

DR. ULSH: -- probably (audio distortion) closing items, so, yeah.

CHAIR BEACH: Okay. Sounds great.

DCAS-PER-078, Rev. 0 "Extrusion Plant" Presentation

Kathy, did you want to move on to 78?

MS. BEHLING: Yes. Let's start with 78, and hopefully we'll still have time to get back to Ron's PER-90. But I would like to do 78 next.

CHAIR BEACH: Okay.

MS. BEHLING: Steve, are you okay with that?

DR. OSTROW: Yeah, fine. Okay. Let me get the slides.

CHAIR BEACH: While you get that up, Rashaun, is there a time limit? Can we go to 5:00, or do we have to close out at 4:30?

DR. ROBERTS: See, the meeting scheduled -- in the FRN, it says it goes to 4:30. I think it could be a few minutes beyond that, perhaps.

CHAIR BEACH: Okay. I just would like to have time to talk about next meetings and things like that, which should only take a few minutes.

DR. ROBERTS: Okay.

CHAIR BEACH: Okay. Thank you.

DR. OSTROW: Okay. All right. Can everybody --

CHAIR BEACH: Oh, yeah.

DR. OSTROW: Can everyone see the screen?

CHAIR BEACH: Yes.

(Whereupon, there was an audio interruption.)

DR. OSTROW: Good.

CHAIR BEACH: Yes, we can.

DR. OSTROW: That's a good start. Okay. So, this is PER-078, which applies to the "Extrusion Plant." There we go. Okay. Perfect.

The -- the "Extrusion Plant" TBD, just one of them, site profile was changed from Rev. 1. It was revised to Rev. -- it was changed from Rev. 0 to Rev. 1. And the PER determines the effect on the previously proceeded dose reconstructions.

So, the timeline: January 2018, NIOSH issued the PER. The subcommittee -- the SPR reviewed it on July 28, 2025, and -- and assigned SC&A to do a review of the PER. And March 5th of 2026, we issued our report, and the slide presentation covers what we have in the report.

So, some background. The "Extrusion Plant" is located in Ashtabula, Ohio, operated from 1962 to 1968. And just like the title says, it was an extrusion plant. The main function was to process metals to extrusion, cutting, forging, and chemical treatment. So, it was a metals treatment plant. Metals of interest to the program were primarily uranium, almost exclusively, and somewhat thorium, which were processed for the government. And the plant also did on the side some commercial metal processing of other metals.

Just briefly, what programs did it support: The "Extrusion Plant" received uranium primarily from Fernald and Weldon Spring Plant for processing. Most of the feedstock were billets -- was billets. For the -- the Department of Energy, it did extrusion of depleted and enriched uranium for Hanford N-reactor. That -- the Hanford N-reactor produced -- was a plutonium production reactor, and Savannah River Site, and had a limited

extrusion (indiscernible). And it also did work for DOD producing depleted uranium for armor-piercing penetrators. And the reason they used uranium for this, very high density, 19 grams per cubic centimeter. So, it's good for almost piercing -- penetrators, like anti-tank rounds.

The timeline: The entire history of plant was from 1962 to 2006. The overall radiological production was 1962 to 1991. During that period, uranium either was extracted or could have been processed under NRC license. The production period, radiological production period, was divided into four different ones. The Savannah River production was 1962 to 1988. Hanford production in 1962 and 1988. The thorium production system, they didn't have to deal with -- that was 1962 to 1971. The penetrator work for DOD, 1974 to 1985. That was the end of the production period. Post-production was 1991 to 2006. So, the -- the extrusion was finished, and that was pre -- pre-decommissioning and decommissioning up until 2006. That's the timeline for the plant.

Where did the uranium come from or how much did it come from -- so, divided into two periods 1962 to 70 and '71 to '90, three different types. Enriched uranium, which we'll see later, it's low enriched; normal, natural uranium; and depleted uranium. And this is metric tons, uranium. The -- in addition to the receipts for the N-reactor at Savannah River, the plant also received 9,488 metric tons in uranium -- depleted uranium from 1974 to '85 for the penetrator program. So, in total, it got about 76,000 metric tons of uranium, which is a good amount of uranium over the years.

General process description: The TBD, Revision 1, Attachments B, C, and D, they provide a lot of detail on production processes for the N-reactors

at Savannah River Site and the penetrator program. So, for anyone who's really interested in that, it's all there.

And in the simplest term, "Extrusion Plant" is metal fabrication. And they had a normal metal fabrication equipment; extrusion, forging, extrusion press, and run-out table, and so forth, and so on. And depending on what they were processing, they could also have some chemical processing steps.

Source terms: The -- the process depleted, natural, and slightly enriched uranium. By slightly about 2 percent. That's pretty low. And that's the uranium. And the thorium somewhat. The amount of uranium far exceeded the amount of thorium. The one of the tables was TBD -- the TBD Table 2-7 compares the masses of thorium to uranium. And the mass ratios of thorium to uranium processed per year are less than 0.7 to 2 percent, with the upper bound in 1963. So, it's less than 1 percent thorium to uranium ratio.

So, the source terms consisted primarily of contributions from uranium and members of its decay chain, of course, had a lesser contribution from thorium. It was mainly uranium.

Okay. This gives you -- this is sort of interesting to me, anyway. This shows the slightly enriched uranium, three different isotopes, U-234, 35, and 38, natural uranium, and depleted uranium for the different isotopes. And it gives activity fractions and mass fractions and so forth. And it’s sort of interesting to see, for example, natural uranium, U-234 has an activity fraction of almost exactly the same -- well, here's exactly the same -- as the natural 238 uranium, even though the mass fraction is much, much less. You know, natural uranium is almost all U-238, and hardly any natural

uranium. Well, the reason for that activity fractions being the same is that the U-234, which has a much shorter half-life than the U-238 correspondingly has a much higher specific activity. That's why when you're doing dose calculations, very often you just -- you assume the most of the dose comes from U-234, not U-238 when you have a mixture of isotopes. That's just a little -- little aside here.

Okay. X-ray equipment: No evidence of industrial X-ray sources were present at the plant. Occupational medical X-ray sources: The exams were conducted offsite at a nearby hospital apparently, until transition to onsite in 1981. So, it's not evident when the X-ray equipment might have been removed from the site. So, the TBD just assumed X-rays are taken on site from 1981 to 2006, when the site was decommissioned, even though there's no evidence about it, but there's no evidence the X-ray equipment was actually moved -- removed and not used anymore.

So, internal dosimetry for production period, which is '62 to '88, the -- you have urinalyses data. That was performed quarterly at least from 1962 to subsequent years for uranium. The frequency varied from -- from year to year, and it's not consistent. No evidence of any done for thorium. There was yearly in vivo chest count records for uranium. The TBD provides occupational exposure intakes from uranium dust for 20 different job categories, so they caught pretty much everybody. So, (indiscernible) since we don't have any thorium data, the thorium and recycled uranium intakes are derived from the uranium intake.

So, intake assume -- assumptions for uranium, the intakes are assumed to be Type M or S, primarily because the "Extrusion Plant" received

uranium in metallic form. That's sort of standard. Organ doses were calculated assuming the entire uranium intake was U-234, much higher specific activity. And most of the uranium came from Fernald. Since most the uranium came from Fernald, the ratio of recycled uranium, contaminated uranium is based on the Fernald TBD. They just took it straight from there. This is Revision 1 of the "Extrusion Plant" TBD. And the Revision 1 of the "Extrusion Plant" TBD notes that the -- there wasn't any -- it's not evident that site personnel from the remediation contractor or even RMI -- RMI is another name for "Extrusion Plant," Reactive Metals, Incorporated -- participated in internal or external monitoring program after 2003.

Okay. So, that's uranium. For thorium now. They didn't find any in vitro analyses for thorium and chest counts were not reported until 1979. The -- as we noted before, the maximum percentage of thorium received in any year was less than 1 percent the amount of uranium. So, the TBD guidance is to assume -- assume a thorium-to-uranium mass ratio of 0.01 to thorium processing period of May 1, 1953, to December 31, 1971. So, basically the thorium intake assumptions are based on the uranium. The -- little (indiscernible) math here. Specific activity of normal uranium is a factor of 1.7 greater than that of depleted uranium by a factor of 2.4 less than that of 2 percent enriched uranium. So, it works out that's claimant favorable to normal uranium in determining the relative activity of thorium. That's based on a comparison of masses.

Unmonitored internal dose: The -- based on breathing zone and general air sampling data, the TBD lists occupational exposure intakes of uranium dust for 20 job descriptions, so that's pretty thorough. And to be

expected, the highest doses go to personnel who work closest to uranium. In this case, look at the job titles, was the rod inspectors, stampers, saw man, and extrusion puller. I love the job titles.

And unmonitored uranium intakes are taken from the similar site, Bridgeport system. And that was the predecessor to the "Extrusion Plant", both facilities using the same expression, the same extrusion press, which was moved from Bridgeport Brass, the Adrian facility, and that was the present (indiscernible) to the "Extrusion Plant." All facilities either do the same express -- the same extrusion craft, which was moved from Bridgeport Brass to the "Extrusion Plant." So, that -- that makes sense since they just basically inherited some equipment and processes from Adrian. They used some of the same data, too.

Post-Production, which began in 1991, you had workers performing surveys and decontamination were exposed to some residual contamination on structures as well as contamination in soil. And it's not evident that personnel participating in internal dose monitoring program after 2003. You couldn't find any data on that. Intakes in soil to unmonitored personnel during soil remediation began in 19 -- in 2004, and they were -- the intakes were calculated assuming the exposures were to average soil concentrations similar to the average soil concentrations in locations in the main plant area. They assumed the -- whatever the activities were in the main plant area, they extended that to the offsite also from remediation.

External dosimetry: So, extrusion -- their workers were exposed to external radiation from uranium, thorium, and decay chain progeny. And the next bullets, this is standard assumptions: Photon energies are

assumed in the 30-250keV range, which is favorable to claimants. Shallow open-window doses are assumed to be from electrons with energies greater than 15 keV. They have a good amount of film badge and selected extremity dose information for monitored employees. And the estimate is about greater than 50 percent of the employees were monitored from -- during the -- from 1962 to the end of the production period and into the post-production period, they have some data.

This is sort of interesting. There were sort of limited penetrating neutron doses recorded, but they discounted as probably spurious for two reasons. They found there was contamination from improperly handling of the badge -- that wasn't a good deal -- and the absence of any neutron sources. If you don't have any neutron sources, then you shouldn't get any readings. I took a little more detail. It turns out that they used the -- several different badges, dosimeters over the years. And beginning from 1986 to 1988, there were new five element PLDs that also were capable of recording neutrons if there were neutrons, and that's when they got some neutron doses, sort of accidentally, because they weren't looking for neutrons, and they didn't think that was significant because there weren't any neutron sources in the plant.

The -- Attachment E to the TBD summarizes the dose assignment values of both unmonitored and construction work -- trade workers. It was pretty thorough.

All right. We're finally getting to the subject. Why did they do a PER? Well, the -- when they created the PER in -- I mean, the current version of TBD in 2017, NIOSH reviewed everything. So, they issued PER-078 to

assess the effects of the changes on prior dose reconstruction. the "Extrusion Plant" has very little work. There was no -- no one ever mentioned it looking at past transcripts and Board meetings. It's never been mentioned before in "Extrusion Plant." There's no SEC associated with it. And SC&A never reviewed the "Extrusion Plant" TBD, either Rev. 1 or the previous Rev. 0. So, this "Extrusion Plant" sort of flew under the radar, and as I think I mentioned earlier this morning, this was one of these cases. We never reviewed the SEC -- or not the SEC -- the TBD. We had to perform a focused review of the TBD in this case. Not a complete review, just a focused one.

And our comment: We assessed NIOSH's evaluation and characterization of the issues addressed in the PER and its potential impacts on dose reconstruction, and we concurred with NIOSH's determination that a PR -- a PER was required with no findings associated with Subtask 1.

Subtask 2: Corrective action that (audio drop). Okay. So, bullet two's the important one that we hadn't reviewed the TBD in general. So, we just performed a limited review here. The TBD, Rev. 1 made several changes to Rev. 0, but the PER confined itself to treatment of two things: recycled uranium component and environmental dose. And based on our limited review, it seems to be correct; those are the two main -- the two major changes from Rev. 0 to Rev. 1 that might affect the dose.

So, first, recycled -- in both revisions of the TBD, Rev. 0 and Rev. 1, rely on the same data, which is from a report, "DOE Ohio Sites Recycled Uranium Project Report," which is (indiscernible) report that addresses the generation flow of recycled uranium among Fernald, "Extrusion Plant," West

Valley, and Weldon Spring. And the two -- two B -- the two TBD revisions list supplied source terms at the "Extrusion Plant" and depleted, normal, and slightly enriched uranium, recycled uranium components, and thorium. Those are the five components.

Here we compared the treatment between Rev. 0 and Rev. 1 of the recycled uranium. Rev. 0 just pretty much states that NIOSH reviewed recycled uranium components at Hanford and Fernald and provided some guidance on assigning organ doses. Rev. 1, which is -- has a much longer section on this, it explicitly directs that dose reconstructors use data from the Fernald occupational internal dose TBD since most of the uranium received at the "Extrusion Plant" came from Fernald and would have the same recycled uranium contaminants. So, we felt that -- the (indiscernible) were extensified and more on point in Rev. 1.

The environmental dose, TBD, Rev. 0, the original one, doesn't provide any explicit guidance or include environmental exposures in the dosage reconstructions, and it's not clear to SC&A how any such exposures would have been accounted for. I mean, it isn't mentioned at all. But Rev. 1 is a substantial improvement. It devotes an entire section to unmonitored environmental dose and refers to Reports 197 -- '97 "Extrusion Plant Site Characterization Report," determined from environmental doses, and dose estimates were determined to be well below NRC and DOE limits at the time. They looked at the surface groundwater, air and soil contamination inside and outside the point -- the plant.

And a 1994 report providing guidance assuming average uranium dust air concentrations for unmonitored workers. Those are the two reports that

relied on it, and it gave a lot of information about environmental doses.

So, our comments: We reviewed the two revisions of the TBD and also the reference material that are pertinent. And we concur with the PER that increased the potential to recycled uranium using Fernald TBD data and environmental exposures have the potential to increase assigned internal doses to personnel.

Selection criteria: Okay. Started out with 348 previously completed dose reconstructions, 125 were removed for having probabilities of causations greater than 50 percent, 195 claims removed for having the word extrusion in the initial search, not referencing work in the "Extrusion Plant." The TB -- in the SRDB, did a word search and came up with one of the searches was extrusion.

Eight claims were removed from being in process; already completed using TBD, Rev. 1, or pulled from the department -- from the dose reconstructions by the Department of Labor. So, in total, out of the 348 initial dose reconstructions, 328 were removed, leaving only 20 claims to reconsider.

Those are the ones that we considered. SC&A believes the selection criteria used by NIOSH is valid, and they're reviewing -- they reviewed all affected noncompensated claims. The -- we believe again, the PER is conducted in a timely matter -- manner and with no findings associated with Subtask 3.

Finally, I think, audit of re-evaluated dose reconstructions, Subtask 4. Re-evaluation process found that none of the claims with POCs less than 50 percent now had POCs greater than 45 percent. Or another way of saying

that, they all have POCs less than 45 percent. So, we recommend that to extent feasible, the Board select for additional evaluations two reworked dose reconstructions with the highest POCs, preferably from workers with different job titles.

Okay. That's the end.

CHAIR BEACH: Thank you, Steve. Did you recommend any timing years for that, or does it matter?

DR. OSTROW: No, I don't think --

CHAIR BEACH: Like, earlier -- okay.

DR. OSTROW: (Audio distortion) matters -- matters (audio distortion). I don't think that's an issue.

CHAIR BEACH: Okay. Well, this -- this report brought up a lot of questions for me, which had me digging into the earlier reports, 56, Rev. 1 and Rev. 0. I'm going to hold my comments, though.

Any subcommittee members questions? Loretta, Arthur, or Paul?

MEMBER BEACH: Josie, this is Loretta. Yes, and I do have --

(Whereupon, there was a continuing audio interruption of an attendee unmuted.)

MEMBER VALERIO: So, before I ask my questions, I am going to state that of all the reading material for this meeting, this is the one that I found the most interesting. So, if we can go back, I believe, it was Page 5 or Slide 5.

DR. OSTROW: Okay. This one?

MEMBER VALERIO: Yes. So, maybe NIOSH or someone else can refresh my memory, but I don't recall another site where the Department of

Defense was covered as part of a -- you know, for purposes of this program, as part of a DOE site. So, that confused me. Is -- is Department of Defense covered from this site?

DR. OSTROW: This is Steve. SC&A doesn't have any clue for that one.

MEMBER VALERIO: NIOSH?

MS. MARION-MOSS: This is Lori, Loretta. Typically, I don't (audio interference) you know, the details of this offhand, but typically (audio interference) DOD operations (audio interference), but I will have to look into that further.

MEMBER VALERIO: Okay. So, then that brings my next question. So, on Page 5, it references the armor-piercing penetrator program for Department of Defense (audio interference). And then I believe on the next page, if you can move on to that, the last sentence, the paragraph, it says, you know, the -- the depleted uranium from 1974 to 1985 was for the DOE penetrator program, so that confused me. Was that for the DOE or the DOD penetrator program, or is that just a typo?

DR. OSTROW: It's a typo. It should be DOD.

MEMBER VALERIO: Okay. And now, if we go to Page 7.

DR. OSTROW: Well, so -- hang on one second. It possibly -- I -- I'll just theorize on this. I don't know the definitive answer, but if they were doing the work at the same time on the DOE program and the DOD program for the armor pierce -- piercing, the -- they might not be able to distinguish a worker's particular exposure from, you know, DOD or DOD -- DOE or DOD or uranium. That might be (audio interruption) there's no way to distinguish

them. And there's --

MR. BARTON: And if -- if I could -- this is Bob Barton. I've heard a lot of these discussions and, you know, some of these sites did, like, commercial work along with Department of Energy or AWE kind of work. And so, as Steve just said, if you can't distinguish where the source term was coming from, the program EEOICPA considers both of them. So, that's -- that -- I think that's the reason it's in the timeline. And if you look at the timeline, I mean, there's a lot of -- lots of overlap here with what was being done for DOE and what was possibly being done for DOD. So, I think --

CHAIR BEACH: Yeah.

MR. BARTON: -- I think that's where the confusion is coming from.

MS. MARION-MOSS: Again, and -- this is Lori. And that's (audio distortion) mentioned. When you can't distinguish and it is -- it's covered operational period.

CHAIR BEACH: Yeah. And this is Josie. I read 0056, and there is a paragraph around Page 15 or 16 that does cover that, because I made a note of it. So, it is in there. It -- like, the discussion that's been going on, so it's covered. All right. Loretta, do you have other questions?

MEMBER VALERIO: Yes. And -- and thanks, everyone, for clarifying that for me, because that did confuse me a little bit between Department of Defense and Department of Energy.

And it's -- it's more of an observation, not really a question. The amount of claims, the 348, a substantial of those, roughly a third of them, a little over a third of them resulted in a POC over 50 percent. And that's something that we have not seen very often. So, that's not really a

question. It's more a comment unless somebody wants to, you know, expand on that.

CHAIR BEACH: He's moving the slides to wherever that was.

DR. OSTROW: At the end --

CHAIR BEACH: I believe --

DR. OSTROW: It's at the end somewhere.

MEMBER VALERIO: It's at the end. It's right there.

DR. OSTROW: Oh, here we go. (Audio distortion) oh, maybe not. Let's see. Oh, I think it's a slide before.

MEMBER VALERIO: That's not it.

DR. OSTROW: Oh, it's --

CHAIR BEACH: No, I thought you had it.

DR. OSTROW: Here it is. It's --

CHAIR BEACH: You talked about --

DR. OSTROW: The second bullet.

CHAIR BEACH: Yeah, 125 claims. Okay. And that's probably nothing you can answer here. That came straight out of the documentation, correct?

DR. OSTROW: Yeah, I assume so. That's what the -- that's (audio distortion) dose reconstructions came out. We don't know the answer to that.

CHAIR BEACH: Okay. Anything else, Loretta?

MEMBER VALERIO: I think that's it. And, again, that -- and -- and let me just expand on that a little bit, Josie, I apologize. When I looked at the numbers and the fact that they all went through dose reconstruction, it just kind of makes me wonder the -- the -- maybe the exposure that these

people received, maybe. I don't know, but it just seemed like a high number for that were over the -- the 50 percent threshold for the number of claims that -- you know, for the 348. So, again, it was just an observation on my part.

CHAIR BEACH: Got it. Thank you.

Paul, Arthur, any comments or questions?

MEMBER FRANK: No, I don't have any comments. This is Arthur. Thanks.

CHAIR BEACH: Okay.

MEMBER ZIEMER: Yeah. Well, I think Loretta's right on that percentage. On the other hand, on some of these sites like this one, they do use a lot of claimant-favorable assumptions. So, that might be part of it.

My only -- I just wanted to request, could we see the -- your final conclusions, Ron (sic), again? I lost track of a couple of things here. Oh, no, it wasn't Ron, but yeah, the final conclusions.

DR. OSTROW: Steve.

CHAIR BEACH: Yeah.

DR. OSTROW: We have --

MEMBER ZIEMER: I forget what slide number it was.

DR. OSTROW: We have several final conclusions, depending on what --

MEMBER ZIEMER: Yeah.

DR. OSTROW: -- you're asking for. Okay. You want --

MEMBER ZIEMER: Just go to the -- toward the end there. Yeah.

DR. OSTROW: This was a selection criteria -- criteria that we had no

findings associated with Subtask --

MEMBER ZIEMER: I'm sure -- Right. Right.

DR. OSTROW: And I have to back to the Subtask 2 conclusions, which is a while back. Hang on.

MEMBER ZIEMER: Oh, there -- there we are, I think.

DR. OSTROW: Subtask 2 is that we -- that the PER increased (audio distortion) to recycled uranium using Fernald data and it --

(Whereupon, Dr. Ostrow and Member Ziemer speak simultaneously.)

MEMBER ZIEMER: Yeah. You have a comment there, Had the potential to increase assigned internal doses to personnel. That was -- that was a comment. I was trying to associate that with Loretta's question. Okay.

DR. OSTROW: And Paul, you're right, though, that the -- just the -- you know, why you have so many POCs greater than 50 percent could just be an artifact that the -- you know, they tend to use a lot of claimant-favorable assumptions. You know, when in doubt, assume something claimant favorable, and that could have driven the POCs greater than 50 percent.

MEMBER ZIEMER: Yeah. This was --

MR. SIEBERT: Hey, a -- just -- I apologize. This is Scott Siebert from the ORAU team. I can probably help out with this. I'm sorry. I've been furiously looking -- that -- that 348 is not -- there weren't 348 claims that had extrusion employment. They were 348 claims that initially met the requirements that we had to start pulling down the number of claims. There were only 33 claims that were actually extrusion claims -- "Extrusion Plant"

claims. That 350-ish number really reflects -- we did a search for the term "extrusion" --

MEMBER ZIEMER: Oh, yeah.

MR. SIEBERT: -- in all dose reconstruction reports, and that was a good 300 -- over 300 of those claims. When we pulled out the extrusion that had to do with any other site, which would have been any statement of extrusion, the type of work another site did, that pulled out a large amount of those. However, before we touch those to look for removing extrusion, the first cut we do is we pull out anything that's over 50 percent. So, a large percentage of over 50 percent have nothing to do with reactive metals because --

MEMBER ZIEMER: Yeah, I --

MR. SIEBERT: -- plants. They are just the initial numbers, and then we pulled those out. So, I hope that helps out.

MEMBER ZIEMER: Yeah, that helps a great deal. Thank you.

MEMBER FRANK: (Indiscernible) --

DR. ULSH: Yeah, this is --

MEMBER FRANK: -- (audio distortion).

DR. ULSH: Well, this is Brant. I'm looking in NOCTS right now, so Scott, if I say anything that needs correction, please jump in. But there are, in NOCTS at least, 39 total claims for the "Extrusion Plant." We've completed 37 dose reconstructions, and ten of those were greater than 50 percent.

MR. SIEBERT: That is correct.

MEMBER ZIEMER: So, that's 10 out of 39; is that -- is that right?

DR. ULSH: Yeah. Well, 10 out of 37.

UNIDENTIFIED SPEAKER: Because 10 were pulled.

DR. ULSH: No, 10 out of 37.

MEMBER ZIEMER: Well, that's not such a high percent then.

DR. ULSH: Less than a third if my math is right.

MEMBER ZIEMER: Yeah, yeah, yeah. Thank you.

CHAIR BEACH: All right. And when I went through and reviewed the earlier TIB -- O -- 0056, Rev. 0 and Rev. 1, Steve, you said you did a focused review, but we have not done a full review on that; is that correct?

DR. OSTROW: Yeah. For this one, for "Extrusion Plant," we didn't do any review previously. So, the --

CHAIR BEACH: Okay.

DR. OSTROW: -- the PER, we did a -- so, a focused review of Rev. 1, which is meaning we didn't dig into the -- all the nitty gritty of it, just basically to support the PER evaluation.

CHAIR BEACH: Yeah.

DR. OSTROW: In the past -- in the past with other PERs that we have looked at, or I have looked at in these cases, sometimes the -- the -- this work group goes ahead and asks us to do a full review of the TBD, but in this case --

CHAIR BEACH: Yeah. And --

DR. OSTROW: -- we haven't --

CHAIR BEACH: -- well, and --

DR. OSTROW: -- with that.

CHAIR BEACH: Well, and that's what I'm coming to now, because

reviewing on my own those two, I came up with several pages of questions and comments, which I'm not going to go through now, but I would like to task SC&A to review both of -- well, Rev. 1, I would say, we'd start there with the comparison between the two. I know that's out.

Is there any problem with that, Rashaun?

DR. ROBERTS: No. Is the rest of the work group in agreement?

CHAIR BEACH: Subcommittee members, do you agree with that?

MEMBER VALERIO: This is Loretta, I agree.

MEMBER FRANK: Yes.

CHAIR BEACH: Okay.

MEMBER ZIEMER: I think we can do that.

CHAIR BEACH: Thank you. And -- and the --

MEMBER ZIEMER: We are getting we are getting awful close on time here, so I'm going to have to --

CHAIR BEACH: We are --

MEMBER ZIEMER: -- be leaving --

CHAIR BEACH: We are.

MEMBER ZIEMER: -- shortly.

CHAIR BEACH: Okay. So -- so, you are tasked with that. And I'm not going to go through the tasking. I think, Kathy, you've probably got a few things that we talked about.

MS. BEHLING: I do, --

CHAIR BEACH: Rashaun, --

MS. BEHLING: -- yes.

CHAIR BEACH: -- can -- can we talk about the next meeting?

DR. ROBERTS: Yes, I --

CHAIR BEACH: And I know we won't be able to set a date, but maybe we can set a couple of dates because you'll need to verify with all the members.

DR. ROBERTS: Yeah, that's fine.

CHAIR BEACH: I was hoping to go into September, sometime towards the end of September, mid-September-end. And maybe not -- other than what we've tasked with, maybe try to do some cleanup and just kind of move forward. That way we have time to prepare for our December meeting. And I don't think we're going to need a full meeting. Well, we might based on what we didn't get to today.

Kathy, do you --

MS. BEHLING: Yeah, I --

CHAIR BEACH: -- have any ideas on that?

DR. ROBERTS: Josie, I'm sorry, I'm hesitant to schedule something that soon. I'm thinking it needs to be pushed back a little farther. And I know last time we had the subcommittee meeting, NIOSH had, you know, expressed some issues with their workload as well. So, you know, remember, these things have to get approvals and things like that.

CHAIR BEACH: So, would October --

MS. MARION-MOSS: This is Lori. This is Lori, Josie. I -- I wanted to -- was wondering if the subcommittee could consider some of the things that we're -- we're up against here, the latter part of the year, and especially with our contract issues that we have before us and -- and personnel issues. If we can look for -- if they could -- if you guys can consider scheduling the

next meeting, probably early part of next year, that gives us time to get -- hopefully come back to this subcommittee to discuss more documents where we have responses and closure information --

CHAIR BEACH: Just so -- if we --

MS. MARION-MOSS: -- (indiscernible).

CHAIR BEACH: Lori, thank you for that.

If we do that, Rashaun, this is a question for you, I would like to continue closing out documents like we have scheduled for August. It'd be nice if we could -- could we do it by email to bring the rest of -- we're almost to the end of our closeout documents. Is that something we could do via email for our December meeting without holding a meeting? Just Kathy, give us the list and we determine if we can move forward with those?

MEMBER ZIEMER: This is Paul. I'm not sure we can act independently of public meetings.

CHAIR BEACH: Yeah, that's what my question was. We already actually have the list. If we took a few --

(Whereupon, Member Ziemer and Chair Beach speak simultaneously.)

CHAIR BEACH: No, no, no, and I get that, Paul.

I'm -- now I'm asking, could we go through those potential for December and agree on them today, or -- or is that something we could do without having a meeting? That way we can still finish some work for December -- our December Board full meeting. And if not, that's fine; just let me know.

MS. BEHLING: This is Kathy Behling. And -- and not to contradict anyone here, I was just looking through a list of things I was hoping that

perhaps we could have maybe a September or October meeting where we don't introduce anything new, we just try to close out. I had been making a list, like I said, of NIOSH's responses that already exist in the BRS, and so there are several, like OTIB-92, and I have different ones listed here that we could perhaps close out. The other thing is, I took those -- we have two OTIBs that there was never a formal closeout process with the -- with the subcommittee, and that could be something that we would discuss. It would not burden NIOSH at all. And, in fact, perhaps by that point in time, Lori would even have some more responses, and we could help them to clear those off the board, you know, to clear those. And so, scheduling another meeting is not meant to impose more work on NIOSH, but rather maybe resolve some of these older issues. I don't know if that's something you would consider.

MS. MARION-MOSS: This is Lori. Yes, I would consider that.

DR. ROBERTS: Okay. And -- and again, the meeting could not be scheduled anytime in September. And that is -- that is per our FACA office. There are some closeout things that we need to be working on. And as I said before, you know, we do need to get clearances and things like that for these meetings. So, I would say October would be the soonest.

CHAIR BEACH: I would be in agreement with October if -- if everybody -- and keeping in mind what Kathy said, to just mainly continue to clean up and not burden NIOSH, at this point. I'm totally on board with that.

MEMBER ZIEMER: So, that's fine with me. I'm going to sign off now. Let's let Rashaun work out the dates later.

MS. BEHLING: Okay. Thank --

MEMBER FRANK: This is Arthur. I mean, I'm -- I'm gone a good part of October. There's an overseas meeting. The last week of October is about the earliest I could plan on doing this.

CHAIR BEACH: Okay. Thank you for that.

MEMBER FRANK: The 27th, 28th, and 29th are the three days that I've got open for this.

CHAIR BEACH: Great. And thank you, Paul.

Rashaun, can we just tentatively --

DR. ROBERTS: Yes.

CHAIR BEACH: -- look at those three dates? And then I know you need to check with Frazier.

DR. ROBERTS: Right. Yeah, I can send -- I'll do the usual polling. Okay. And I appreciate everybody working with us. We're -- we're not trying to burden. We are just trying to close out and move forward. Understanding, Lori, you've got your hands full also.

MS. MARION-MOSS: Yes.

CHAIR BEACH: Anything else for the good of the subcommittee? Kathy, do you know do we need to go through the tasking, or are you okay with everything we did today?

MS. BEHLING: I've been taking notes. I'm okay.

CHAIR BEACH: Okay, okay. Rashaun, I think we're ready to adjourn unless somebody else has something.

MR. BARTON: Yeah, it's Bob. I'm sure --

CHAIR BEACH: Hi, Bob.

MR. BARTON: -- hear my voice --

CHAIR BEACH: -- go ahead.

MR. BARTON: -- right now. On the --

CHAIR BEACH: Yeah?

MR. BARTON: -- on the tasking and everything, I -- I think we can probably handle it. You know, on -- on -- with what has been discussed today. But also keep in mind that there's a bunch of big meetings coming up, including LANL, Lawrence Livermore, --

CHAIR BEACH: Yeah.

MR. BARTON: -- I mean, a bunch of stuff that's coming up that's going to occupy everybody's time. So, I -- I've watched this kind of, you know, flounder and tread water, but I think we might be okay during the summer months, and it would be okay until, you know, the new fiscal year, I do.

CHAIR BEACH: Okay. Great. Thank you.

MR. BARTON: With -- with -- with what we discussed today --

CHAIR BEACH: Okay. Yeah.

MR. BARTON: -- as well.

CHAIR BEACH: Okay. Well, we won't burden you with any more then.

MR. BARTON: Oh, I'll take it on. I'll just find more people. All right.

CHAIR BEACH: Okay. Thank you.

Rashaun, are we good to adjourn?

DR. ROBERTS: You can do a motion and get a second.

CHAIR BEACH: Okay. I motion that we adjourn the subcommittee meeting.

MEMBER VALERIO: I will second it.

MEMBER FRANK: Second.

CHAIR BEACH: Okay. We got two seconds, so we're good.

DR. ROBERTS: Okay.

(Whereupon, the meeting was adjourned at 4:50 p.m. EDT.)