CENTERS FOR DISEASE CONTROL AND PREVENTION

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

ADVISORY BOARD ON RADIATION AND WORKER HEALTH

LOS ALAMOS NATIONAL LABORATORY (LANL) WORK GROUP MEETING

WEDNESDAY, DECEMBER 3, 2025

The meeting convened at 11:00 EST

via teleconference,

Josie Beach, Chair, presiding.

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PO Box 72314

Marietta, GA 30007

678-646-5330 ext. 514

reporter@vetreporting.com

Members Present:

Beach, Josie, Chair

Lockey, James, Member

Martinez, Nicole, Member

Registered and/or Public Comment Participants:

Roberts, Rashaun, DFO

Adams, Nancy, NIOSH contractor

Adler, Tim, ORAUT

Barton, Bob, SC&A

Behling, Kathy, SC&A

Cardarelli, John II, NIOSH/DCAS

DeGarmo, Denise, Public/SEC Representative

Fitzgerald, Joe, SC&A

Holzberger, Malia, HHS

Marion-Moss, Lori, NIOSH

Merrell, Rich, ORAUT

Nelson, Charles, SC&A

Rutherford, LaVon, NIOSH

Ulsh, Brant, NIOSH/DCAS

TABLE OF CONTENTS

PROCEEDINGS

(11:00 EST)

WELCOME AND ROLL CALL

DR. ROBERTS: This is the good -- official good morning. The Advisory Board on Radiation Workers Health's meeting of the Los Alamos National Lab Work Group is the meeting that you're -- you're in now.

My name is Rashaun Roberts and I'm Designated Federal Official, or DFO, for the Board. And I just wanted to take a moment to express how very glad I am to be with you all today. As you may know, this is the first meeting that the Board has been able to have since last December since the new administration came in last January. There have been a number of changes, new requirements, and, of course, events to navigate to a place where the Board can begin to start meeting again. Now we're hopefully on an upward trajectory moving forward. We've been in the process of seeking approvals for meetings, and of late, those meetings have been approved.

This month we were approved, of course, to have this meeting as well as a meeting of the Idaho National Lab/Argonne National Lab West on December 17th at 11:00 a.m., and a full Board teleconference, which is scheduled for December 18th at 2:00 p.m. So, please keep an eye out on the NIOSH website for upcoming meetings and meeting materials. I do want to make you aware that some of the meeting materials for today were posted quite late, and that's largely because -- (audio interference) -- uh-oh. I'm not sure why I'm echoing. At any rate, it's largely because we have new clearance and approval processes for all materials, and those processes

stalled during the government shutdown and furlough. But looking forward, we do hope that those processes will move more quickly and that we -- and that we will be able to post everything in great advance moving forward.

So, with that, let's get started with the logistics for this meeting. There's an agenda and there are other meeting materials for today. And you can find everything on the NIOSH website under meetings for December 2025. Since Board Members who have conflicts with regard to this site can't sit on this work group, there are no conflict of interests for any of the work group members. Other staff, as I take roll call, will need to state any relevant conflicts as I -- I do the roll call.

So, let's go ahead and start with the work group chair. Beach?

CHAIR BEACH: I am here. Good morning.

DR. ROBERTS: Good morning.

Lockey? I thought I did see Jim earlier. Jim, can you unmute?

MEMBER LOCKEY: Can you hear me now?

DR. ROBERTS: Yes, I can, --

MEMBER LOCKEY: Same here.

DR. ROBERTS: -- great. Okay. Thanks.

MEMBER LOCKEY: Great to be back.

DR. ROBERTS: Yes, great to have you back.

MEMBER LOCKEY: Good to see you, Rashaun.

DR. ROBERTS: Thank you. You as well.

And Martinez?

MEMBER MARTINEZ: I'm here. Good morning.

DR. ROBERTS: Hi. Good morning. Okay. So we've got all our work

group members. I will go ahead and open the roll call to DCAS first. And, again, state any conflict of interest that you might have.

MEMBER LOCKEY: Rashaun, where's Brad?

DR. ROBERTS: So, -- so, Brad, we're working on some membership issues for -- for him, so currently it's just the three of you.

MEMBER LOCKEY: Okay.

DR. ROBERTS: Okay. So, roll call for DCAS.

MS. MARION-MOSS: This is Lori Marion-Moss, and I have no conflicts.

DR. ROBERTS: Okay.

DR. NELSON: This is Charles Nelson; I have no conflicts.

DR. ROBERTS: Okay.

DR. ULSH: Brad Ulsh, no conflicts.

DR. CARDARELLI: John Cardarelli, no conflicts.

MR. RUTHERFORD: LaVon Rutherford, no conflicts.

DR. ROBERTS: Okay. Let's -- anybody else for NIOSH/DCAS? Okay. Let's move to SC&A.

MR. BARTON: Bob Barton, SC&A, no conflicts.

MR. FITZGERALD: Joe Fitzgerald, SC&A, no conflict.

DR. ROBERTS: Okay. Anyone else for SC&A today?

MS. BEHLING: Kathy Behling, no conflict.

DR. ROBERTS: Okay. If no additional for SC&A, let's move on to HHS and contractors.

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

MS. ADAMS: Nancy Adams, NIOSH contractor, no conflict.

MR. ADLER: Tim Adler, ORAU Team, no conflict.

MR. MERRELL: Rich Merrell, ORAU Team, no conflict.

- DR. ROBERTS: Okay. Anybody else, HHS and contractors? Okay. Hearing none, are there any -- is there any participant from the departments, DOL, SEC

, on the call today? Okay. Hearing none, let's move to members of the public who would like to register their attendance today.

DR. DEGARMO: Denise DeGarmo, authorized petition representative for 0256 Pinellas and 0266 Hematite.

DR. ROBERTS: Great. Thank you and welcome.

Anyone else, members of the public?

Okay. Well, thank you so much. And, again, welcome to everybody today. I do need to go over a couple of additional items before I give the floor to Josie. In order to keep things running smoothly and so that everybody speaking can be clearly understood, please mute your screen if you're on Teams or your phone, if you're on the phone when you're speaking. Typically the mute button is in the lower left-hand side of the screen, although that might vary. But if you're attending by telephone, press star 6 to mute. If you don't have a mute button and if you need to take yourself off mute, press star 6 again.

So, again, the agenda and presentations, etc, that are relevant to today's meeting can be found on the NIOSH website. If you are on Teams, you should be able to see the presentations and follow along that way. If you're participating by phone, then you'd have to open the presentations from the website. And all materials were sent to the Board members who participate on this work group and to staff prior to this meeting.

So, with that, I will go ahead and turn the floor over to Josie.

CHAIR BEACH: Thank you, Rashaun.

PREPARATION FOR DECEMBER 2024 FULL ABRWH MEETING: REVIEW OF TECHNICAL GUIDANCE DOCUMENTS READY FOR FULL BOARD APPROVAL

CHAIR BEACH: Good morning, everyone. Everybody should have all the agendas up if you're looking at that. I believe Joe is going to do a -- just a quick overview of where we've been. We haven't met since 2022. So, I'm going to turn it over to Joe in just a second.

But before I do that, are there any additions or corrections to the agenda as it's posted?

DR. CARDARELLI: Hi. Hi, Josie. This is John Cardarelli.

CHAIR BEACH: Hi, John.

DR. CARDARELLI: I just wanted to give heads-up that we have a very high-level, overarching presentation on Reports 101 and 102, and just touching on 103. We will not have a presentation on the full Report 103. We will be seeking to have a future meeting to go over that in detail. So, when we get to that part of the agenda, we can discuss that issue further.

CHAIR BEACH: Okay. That sounds great. And with that, my plan is to just go forward, and we'll just take a break as we decide where we're -- where we are in the agenda. Nothing's hard scheduled, if that's okay. If somebody needs a break, raise your hand, and we'll take a comfort break. Does anybody require a lunch break? I know it's 11 o'clock on your time, most of you.

MEMBER LOCKEY: I'm good, Josie.

CHAIR BEACH: Okay. If not, we'll just take comfort breaks as we need them throughout the morning and the afternoon.

All right. Joe, would you like to tee us up?

MR. FITZGERALD: Thank you, Josie. It's been --

CHAIR BEACH: Yes, thanks.

MR. FITZGERALD: -- a long time.

CHAIR BEACH: It has. Thank you.

MR. FITZGERALD: Good morning, everybody. I'm going to give you just a brief general overview, since it has been a while, from our vantage point. And -- and Bob Barton, not to mention NIOSH, will provide probably more detailed background on the -- on the individual reports when their presentations come up, so this is more of an overview. The last work group meeting was on March 23, 2022, almost three years ago. And the one before that was in July of 2019. So, it's covering a lot of ground here.

For the 2022 meeting, NIOSH presented its reports 101 -- I'm sorry, 0101 and 0102. And these were the reports, bounding intakes of exotic radionuclides. That was 10 -- 0101. And 0102 was assessment of Los Alamos' plutonium bioassay programs, '96 to 2001. And as Mr. -- Dr. Cardarelli said, report 0103, potential exposure to exotic radionuclides, came out after the 2022 meeting. And we developed a response, but that actually was never presented formally to the work group, so that's the basis for doing so today.

And just going back to the 2022 meeting, I think Josie had started that meeting noting that the -- that these analyses, as reflected in these reports,

the -- the -- the review that was -- had been done wasn't the one that was expected by the work group in terms of the sampling plan that the work group had reviewed before that. But I think it was clear that NIOSH had decided at the time it made more sense to review all of the available RWPs that were -- you know, that were given by Los Alamos -- that Los Alamos had. And from that review and evaluation, the conclusion was that a coworker exposure model can be based on the relatively larger number of plutonium bioassays available. So, that was how that was left. And certainly that was a lot of the discussion in 2022.

And further, that NIOSH at that time had concluded their approach as part of an overall weight of evidence assessment, provides a basis for dose reconstruction with sufficient accuracy for the SEC period that we're certainly reviewing, which is 1996 to 2005.

And just again, going back to the last two work group meetings, I think it's really important to recall that the -- the root of this current issue largely stems from the findings of a noncompliance report, NCID 484 -- 484, which incorporated or reflected a 1999 Los Alamos self-assessment. And that assessment, if you remember, identified programmatic deficiencies, including those in SC&A's judgment anyway, which impacted Los Alamos' ability to monitor workers likely to receive 100 millirem CEDE per year, which is the threshold that we've been -- and NIOSH has been looking at as a basis for dose reconstruction.

And SC&A viewed that particular review as significant because, given the status as one of the few independent in-depth validations of Los Alamos practice in terms of 10 CFR 835 program implementation in the late '90s,

there weren't a lot of comprehensive reviews that were done on how that 835 was being effectively implemented, but certainly that particular one, the basis for 484 in terms of the 1999 review was a fairly thorough and independent one. So, I want to point that out.

And finally, much of the current work group deliberation, what we had spent a good amount of time, certainly in 2022, centers on the bioassay data representativeness for exposure to exotic radionuclides and to a large extent whether data for primary radionuclides, principally plutonium, would be relevant to that question and would be applicable. And in conjunction and likewise, whether basically historic Los Alamos contamination control programs -- whether they would provide sufficient assurance as part of a weight of evidence argument that -- you know, that there's a sound basis for applying these bioassay -- this bioassay data in the -- in a co-exposure model.

That is a very brief outline of where things were left, and I -- I don't pretend that is sufficiently detailed for the kind of discussion that we need to have, but more details, I think, will clearly be provided in Bob Barton's discussion as well as in Tim Adler's discussion. So, those details will follow. That's the broad brush 30,000-foot overview. Thank you.

CHAIR BEACH: Yeah, Joe, that was perfect. That was what we were looking for is the 30,000-foot, as you call it, and we'll get into the details now if -- any questions for Joe or comments?

MEMBER LOCKEY: Joe, Jim Lockie. How are you?

MR. FITZGERALD: Good. Good. I'm still here.

MEMBER LOCKEY: You're still here. Just one question about the 484

compliance report. I -- I -- I don't recall -- I don't remember that in detail. Were there any major deficiencies, minor deficiencies? How would you describe that?

MR. FITZGERALD: Fairly significant programmatic deficiencies in terms of enrollments. That was one finding, and certainly some questions about whether bioassays, job-specific bioassays were being formed -- I mean, I'm sorry, were being implemented consistent with RWPs. Sort of a similar issue to the Savannah River issue but in a smaller scale. So, that was -- that was kind of the essence of it.

MEMBER LOCKEY: Okay. So, implementation and job-specific bioassays were the two main points, I think, right?

MR. FITZGERALD: Yeah, and I -- just a little more context. A number of the sites were responding to what was a broader enforcement caution that was being sent out by DOE headquarters, and this was on the heels of some issues at Mound Laboratory and Savannah River in terms of the actual implementation of job-specific bioassays and -- and bioassay enrollments. So, all the sites were taking a hard look. And Los Alamos went so far as to invite some outside experts to perform a self-assessment of its program just to provide some assurance that those issues weren't a problem, and there were some findings. That's pretty much how it went.

MEMBER LOCKEY: Thank you.

MR. FITZGERALD: Uh-huh.

CHAIR BEACH: Yeah, and those reports are all available too, the past documents we've reviewed. Okay. Anything else?

Thanks, Joe.

ORAUT-RPRT-101 AND ORAUT-RPRT-102

SC&A Presentation: "SC&A Draft: SC&A Review of Remaining Internal Dose Issues for the LANL SEC-0109 Addendum Period 1996-2000" (April 12, 2024)

CHAIR BEACH: Let's go ahead, Bob, if you're ready. It looks like your slides are teed up.

MR. BARTON: All right. I guess I'm on. Can everybody hear --

CHAIR BEACH: Good morning.

MR. BARTON: Good morning, --

CHAIR BEACH: I -- I --

MR. BARTON: -- everybody. It's nice -- it's nice to hear familiar voices. It's been --

CHAIR BEACH: Yes, it is.

MR. BARTON: -- such a long time.

CHAIR BEACH: Yeah.

MR. BARTON: All right. So, Joe, thank you for really giving a great overview of what we're discussing here today. SC&A is going to be presenting its review of three reports, Report 101, which is "Bounding Intakes of Exotic Radionuclides at Los Alamos National Lab," Report 102, "Assessment of Los Alamos National Laboratory Plutonium Bioassay Programs 1996-2001," and Report 103, "Review of Potential Exposure to Exotic Radionuclides at -- Radiological Work Permit Data at Los Alamos." And these three reports are all tied together at the hip, so our review approach really consolidated them into one single SC&A document to try to

address all three, since, again, they're tied at the hip, so to do them separately would -- we thought would be kind of confusing.

It is a pretty lengthy review, something like, you know, 100 pages. I posted the link or attempted to post this review in the chat window, so hopefully you can all find that. And it's been so long, we tried not to dive too deep into the weeds for this. I guess it's sort of a kickoff meeting or restart of the work group after a lengthy halftime, to borrow another sports metaphor. One thing I'll note, and as you'll see in the agenda, we split 101 and 102, and as Joe indicated. And 103 is sort of a separate item on the agenda. And again, the reason for this is that NIOSH had already presented 101 and 102, however, has not had the opportunity to present 103. So, it seemed prudent to sort of split up our review based on that.

So, yeah, again, for proper order of operations, we broke out SC&A's review into two separate presentations, though it is really just one report from our camp, which, again, can be found on the website. And hopefully that link works. So, with that introduction or overture to the first of the two SC&A presentations, which it appears is working, I'll get started.

CHAIR BEACH: Sounds great. Thanks, Bob. And I thought the way you guys handled this report was perfect. It's very clear for me.

MR. BARTON: I appreciate that, Josie. Thank you.

Revisit, again, some background on SEC 0109. It has the end date of 1995 thus far, so the evaluated period is after this. And this is really based on the -- that assumed effective implementation of 10 CFR 835, which mandates any worker with the potential for 100 millirem of dose be monitored accordingly. So, really that is the main premise that is under

discussion, encompassing essentially all the material contained in these three reports and SC&A's review.

Prior to 1995, or really 1996, there wasn't enough confidence that 835 had been implemented, as you can see here, inability to bound unmonitored intakes of exotic alpha emitters, fission products, and activation products. So, again, the established SEC is up to 1995. And sounds -- the --

And I hear some background. Can people still hear me okay?

CHAIR BEACH: Yeah, I can hear you. I do hear the background, though.

MR. BARTON: Okay. Well, I'll --

CHAIR BEACH: Good reminder to mute, everyone.

MR. BARTON: All right. I'll carry on.

So, again, the established SEC is up through 1995. And basically found that the evidence was lacking to say that dose reconstruction is feasible for these exotics. However, it has been posited that programmatic controls, things like air samples, contamination controls, and other, what I'll call, indirect monitoring such as a regular surveys, swiping (audio break), moving around with an external monitoring instrument, there were self-monitoring stations, that -- exceeding 100 milligram and not being monitored for internal updates is unlikely.

And the second facet is the abundance of bioassay data available. And this conclusion is that there was a paradigm shift based on 835 after 1995 to assure that any doses can feasibly be reconstructed either based on the bioassay data itself or the 100 millirem threshold assignment. Okay.

Well, as stated on the previous slide, the conclusion of the evaluation

report for the post-1995 period is that one can use that 100 millirem as a bounding approach for any unmonitored or partially monitored workers. So, that's basically -- we usually -- used to call it a coworker model. Then -- now it's a co-exposure model. I'm going to call this a co-exposure framework. But that's how you -- it's being proposed to assign unmonitored doses.

So, the genesis of SC&A and the work group's initial concerns, as Joe indicated, is simply having a lot of bioassay data. It doesn't necessarily mean that 835 wasn't effective immediately at this time. Clearly, there are unmonitored workers. Otherwise, there wouldn't be any need to assign dose to them. And this comes back to NCID 484. You're going to hear that a lot in our presentations, which happened back in 1999. That identified a potential problem with completeness, data gaps for enrollment, and also radiation work permit-specified bioassay sampling.

And this would be essentially nonroutine bioassay sampling based on some specific job, such as, maybe, removing a glove box or any modifications to the process areas, etc. And NIOSH agreed that follow-up was needed with the site to see how extensive any potential issues that were identified in that document with the internal monitoring program -- that might affect the ability to reconstruct dose.

So, the results of the interviews, or interview results, basically characterize it as there was no real process to assess if individuals were leaving the required bioassay. The adequacy of the radiation work permits, RWP, checklists, prescribing bioassay was only really done going forward, so they didn't look backwards once it was identified. And obviously, some of

you are familiar with the similar situation at Savannah River, where they did actually retroactively sample for at least the previous year once this sort of complex-wide issue was identified. So this, again, would have been in 1997 at Savannah River.

So, similar to that situation, the path forward was to sample the RWPs, again, radiation work permits, to see if you could match them up with the available bioassays. It was originally going to be a statistical sampling, however NIOSH eventually elected to just grab all they could, so all the -- all the available RWP -- RWPs they could find for analysis, or further analysis anyway.

So again, these are the two reports that I mentioned earlier, so we don't really need to spend some time on this slide moving along.

SC&A, again, as Joe mentioned, was tasked in March of 2022 to assess the RWPs in the context of job-specific bioassay. In particular, the exotic radionuclides, which are loosely defined as "other than plutonium." And as I mentioned earlier, one of these evaluative reports was 103. And we're on 101, 102 right now, but 103 later. And that -- that's later, again, on the agenda today.

So, some comments on SC&A's review approach. Again, in a general sense, we examined how this trio of reports are complete and representative, which is the question of the day. This is the question for SECs. And as you know, complete and representative are key components to NIOSH's guidelines for how they can justify and construct a co-exposure model. Also included was a review of the programmatic documentation. Essentially, how effectively were radiation protection policies, the

procedures, and such, how effectively were they implemented actually in the field. Obviously, specifically by 1996 and on, which is the period we're concerned with today.

Okay. On to the findings and observations for the first report, which is 101. So, we have finding 1, which is basically pointing out that the evaluation of survey data, like smears and air sampling, are not a random sample, but were meant to be illustrative of the program in general and in place. So, really the main takeaway from this slide is, again, it's not a random sample, nor necessarily representative. And I think this is actually echoed in Report 101 by NIOSH.

Finding 2 is sort of a corollary finding to the previous one, finding 1, in that we really don't know how complete the dataset evaluated is. There's no currently known way to compare the data collected, captured, to how much should exist. This would be accomplished by things like periodic health physics reports, and such documents from the site saying something like, you know, in the first quarter of 1996 we took X measurements in Y area, that sort of thing. So, that's really finding 2.

Finding 3, keeping -- keeping in mind that the purpose of Report 101 was meant to be illustrative. However, many of the examples put forth were not in effect until the year 2000. So again, we're starting in 1996 and looking forward. Examples were given of documented incidents of contamination detected with things like fixed monitoring stations. However, the ones at the start of the period of interest were really associated with the main plutonium facility. And plutonium is really not the area of concern here today. As many of you know, plutonium was the main purpose for LANL.

So, it is reasonable -- it's reasonable to assume they concentrated their rad. protection on those areas.

We have three observations for Report 101. And again, these observations may be beyond the scope of what was intended for Report 101. But again, all these 3 reports are tied together, so we felt that they were relevant.

So, the first observation was that there was no actual designation on which unmonitored workers would receive this proposed 100 millirem assignment. I mean, is it all workers? Is there a way to delineate between exposed and nonexposed workers? But this would really be something to hammer out if a 100 millirem framework is acceptable -- deemed acceptable.

Observation 2 simply notes that there were duplicate entries included in the dataset that NIOSH put together. But it was a pretty small percentage, and we don't really feel it was likely to affect the analytical results. But we thought it worth noting.

Observation 3 -- excuse me -- notes that in technical area 53, there are a couple of years early in the period of interest, which is post-1995, that would indicate conditions that may (audio break) doses greater than 100 millirem. So again, this is looking at the engineering controls, air samplers, that sort of thing. And working back, it's a -- it's a day one health physics calculation. But we noted that there were a couple of periods or years where it looked like 100 millirem may not actually be bounding for unmonitored workers.

So, our conclusions in our review of Report 101, I mean, the report

posits that the weight of evidence supports the premise that unmonitored doses can be bounded by 100 millirem. And SC&A's conclusions from its review, basically it's not a complete dataset captured from the site, either by year or location. So -- so, the actual completeness of it is rather unknown, or at least uncertain.

And again, the programmatic documentation that was captured is largely dated much later in the period, at least the period of interest, i.e., the year 2000 or later. And that the radiological controls, such as the use of portal monitors, certainly is useful. But the real question is, does it matter -- does it answer the mail as far as actual internal monitoring. This goes back to the weight of evidence, a term you're going to hear at least 100 times today, which is weight of evidence is ultimately a professional judgment call for the Board. Okay. So, that was Report 101.

Like I said, --

CHAIR BEACH: I was --

MR. BARTON: -- all three of you -- oop.

CHAIR BEACH: Oh, I'm sorry. I was going to say, do you want to pause and see if there's any questions before you move on?

MR. BARTON: Sure.

CHAIR BEACH: So, any -- any -- Nicole? Jim? Or are you ready just to keep going?

MEMBER MARTINEZ: No questions for me currently. Thank you.

CHAIR BEACH: Thanks, Nicole.

MEMBER LOCKEY: Can I --

CHAIR BEACH: Okay. I --

MR. BARTON: I'm sure NIOSH will have -- well, they'll have their presentation themselves --

CHAIR BEACH: Yeah, well, and they'll have a --

MR. BARTON: Maybe it's a --

CHAIR BEACH: Yeah.

MEMBER LOCKEY: Bob?

CHAIR BEACH: -- their presentation.

CHAIR BEACH: Go ahead, Jim.

MEMBER LOCKEY: Hey, Bob. Can you hear me, Bob?

MR. BARTON: Yes.

MEMBER LOCKEY: Yeah, thanks for a nice presentation. On -- on -- on slide 15, where NIOSH says that it can be bounded, not likely exceeded 100 millirems per year, would there -- and this might be a dumb question, but the previous statement that there were some samples 32 or 32 percent above that figure, right?

MR. BARTON: Yes.

MEMBER LOCKEY: Is -- is that -- does the bounding take in this -- does NIOSH bounding take into consideration those instances where it exceeded that by that percentage?

MR. BARTON: Oh. That -- that was basically an evaluation of area monitoring. So, air samplers, swipe data, stuff like that, that when you put it through the calculation of what resulting uptake might be from that, for at least a few periods, it looked like it exceeded 100 millirem. So, it's really -- we're looking at indicators, which is why it's a weight-of-evidence argument. But in certain instances, it doesn't look like 100 millirem might actually

bound doses. But again, I mean, this is a really complex issue, and we're only in the first report. I think maybe your question might get answered later on. But if -- if not, certainly through discussion or further analysis.

But --

MEMBER LOCKEY: The way I -- maybe you can say if I'm in the ballpark or not. If it exceeded third -- exceeded 32 percent on an ongoing, regular basis, then that 100 millirem would not apply. But this might have been an incidental exposure on a one- or two-time basis that did that.

Is that what you're sort of saying?

MR. BARTON: It very well could be. Again, the whole -- the whole concept is a weight of evidence. What data do we have to try to reflect what could -- could -- the potential exposures to the unmonitored workers.

MEMBER LOCKEY: Right.

MR. BARTON: Yeah.

MEMBER LOCKEY: So, in order -- in order for that not to be bounding, an unmonitored worker would have to be exposed to that figure over a prolonged period of time to exceed that 100 millirem more likely. That's how I sort of hear what you're saying.

MR. BARTON: I would say that's accurate, yes.

MEMBER LOCKEY: Okay. Thank you very much.

CHAIR BEACH: All right. Thanks, Bob. Go for it.

MR. BARTON: All right. Moving on to the second report here, assessment of Los Alamos Laboratory plutonium bioassay programs from '96-2001. And like I said, what we just went through with Report 101, but since all three of these are tied together -- this is why it might be confusing

why we're starting on finding 4, because there were three findings in Report 101. Report 102, we just started sequentially on finding 4. And really, again, the findings and observations are sequential across all three. So, I hope this doesn't trip anybody up on this meeting.

So finding 4. This has to do with how workers were considered compliant with the RWP-assigned bioassay program. In Report 102, workers were considered compliant if any of the RWP-required bioassay were facilitated during the year. So, it wasn't specific to any one job. But if, in 1996, they signed in on an RWP and provided a bioassay, they were considered compliant for the entire year. And again, this is for creating summary statistics to try to evaluate how effective the RWP-assigned bioassays were. And I note that this is really primary -- primarily plutonium-related work.

But I guess the question is, what if -- you know, what if the worker left the site before submitting the required sample. And we don't feel this actually demonstrates a compliant RWP program. So really, it's just -- it's one of the assumptions or factors in Report 102 that was used to try and quantify how many of these workers or RWPs actually submitted their required bioassay. And we just disagree with that assumption.

Finding 5, again, relates to the criteria used to evaluate these RWPs and their directed bioassay. Specifically, if a bioassay was submitted the end of the year after the year in which the work was done, we don't feel this really illustrates whether the RWP program was functioning appropriately. We feel it should at least be within one year of the end of job-specific work, not the end of the year after the year in which the job was done. So, it's

kind of a -- stretching the goalpost, if you will. Sorry for all the football metaphors.

Also, if a worker submitted a bioassay during the work but not after the work, does that actually demonstrate a functional RWP-directed bioassay program? So again, are -- are those potential exposures actually being captured?

Finding 6, one of the concepts in this analysis is that if a worker signed the same RWP, then they had the same exposure potential. And so, it doesn't really matter if they were monitored because their co-workers may have been monitored. So, those -- those would be -- those would feed into any potential exposure model. The concept is known as effective monitoring in this program, the program being EEOPA.

It's essentially what we used to refer to as the side-by-side concept. If a worker is monitored and doing the same job as the unmonitored worker, the unmonitored worker is represented in any resulting co-exposure model. And as Joe mentioned, this concept really came to light for Savannah River but was not accepted for at least some time periods by the board.

Okay. The observations. So, observation 4, the lowest observed compliance that was evaluated in NIOSH Report 102 was for a maintenance contractor known as Johnson Controls. And we saw 45 percent compliance even in 2001. Though we also know that another maintenance contractor, KSO Services -- and we assume they're a maintenance contractor, I don't think we definitely nailed that down, but it's logical to assume that -- actually had the highest compliance rate at about 89 percent.

Observation 5, it was posited, again, that the majority of unfulfilled

bioassay were for, quote, legitimate reasons. SC&A, we understand that there are understandable reasons that bioassays went unfulfilled. However, the question is whether the exposures or exposure potential was properly monitored. In other words, it doesn't really matter why the bioassay wasn't submitted, whether appropriate or inappropriate, only to what extent it wasn't submitted.

Observation 6, one part of the analysis considers what is termed "the open window." And this is, again, one of the assumptions that was used to evaluate the available data. It's not to be confused with an open window dosimeter measurement, which is something quite different, but rather the time frame for which the analysis is considered. I mean, for these long-lived radionuclides and really, I mean biologically long-lived, such as plutonium, which the body has a very difficult time excreting. You can measure it many, many years after the actual exposure.

So, we agree, SC&A agrees, with this concept for an individual. But when you actually create a co-exposure model, it is very time-dependent. In other words, a sample taken in 2000 might reflect that worker's exposure in 1996 but would really only apply to unmonitored workers in 2000, because that's when the sample is dated. So, there's -- while we agree it provides a metric that can be useful in evaluating this weight of evidence concept, when you go to actually calculate the statistical distributions and such, that worker's sample only applies to workers in 2000, even though the exposure reflects the work in 1996. That's a hypothetical, but something to consider.

So, conclusions: So, NIOSH concluded that the weight of evidence,

again, you're going to love -- love that term, supports the idea that the highest-exposed workers were included in the bioassay program. Thus, a claimant-favorable and bounding model is possible. SC&A, we agree, we tacitly agree, but since there isn't a co-exposure model yet, I don't know if it's in development or not, it's difficult to say until we can actually see that -- the results and all the hurdles to -- to get through before you can have a -- really a plausible, feasible claimant-favorable model.

And Joe mentioned NCID-484, which raised the questions regarding bioassay completeness and representation. And again, the completeness and representation are the key facets to NIOSH's guidelines on creating a co-exposure model. There are certainly illustrative and weight-of-evidence-type arguments, but the actual weight of those arguments is really a matter of professional judgment for you all, the Board. That's it on Report 102.

CHAIR BEACH: Thank you, Bob. Good presentation. And realizing -- I know NIOSH has a presentation. I don't know if they've been able to address all the findings and observations at this point, and I'm sure they will fill us in on that. Questions from Board members?

MEMBER LOCKEY: Hey, Bob, Jim again. This is, again, just for my education. On page 18, your finding 5 -- it's -- it's my ignorance here -- the last sentence there, SC&A believes the only appropriate time window for submission should be one year after expiration of the RWP. Can you explain that to me?

MR. BARTON: Sure. So, if you have -- if you're working under an RWP which requires you to submit a bioassay sample,

MEMBER LOCKEY: Okay.

MR. BARTON: -- that's really what we were trying to look at. You know, were these sort of non-routine specialized jobs which required internal monitoring actually being fulfilled? So, what Report 102 analyzes is did that happen, or, as in some other circumstances at other sites, they just simply weren't leaving the bioassay sample. So, you have to come up with some sort of metric to gauge that by.

So, what was chosen was that, say, a particular worker submitted a sample at the end of the year of the next year after the work was done. So, it could be two years. It could be 366 days, you know. So, we didn't think that was really appropriate and that it should be more stringent. And that's why we brought it up. How that affects the numbers, we're not really sure. But we thought it was a little too broad of an assumption that that means they were compliant with the RWP prescribed bioassay requirement.

MEMBER LOCKEY: I see. So, you're saying it should be at least up -- at least a maximum one year after you left the RWP and not two years or three years. That's what you're saying, I guess, right?

MR. BARTON: That's what I'm saying. Yes. Correct.

MEMBER LOCKEY: Okay. Gotcha. Now I understand.

MR. BARTON: Thanks.

CHAIR BEACH: Yeah, and Bob, this is Josie. There's absolutely no way of knowing what's missing, right? I mean, you mentioned that it's a weight of evidence, but it's -- we haven't really established if all -- or if everything was collected. It's probably more of a question for --

MR. BARTON: It's --

CHAIR BEACH: -- NIOSH.

MR. BARTON: It's complicated. And I --

CHAIR BEACH: Yeah, I know.

MR. BARTON: We don't know. Well, there was definitely a significant effort to look at the captured RWPs and see if there was a monitoring requirement and then to see if we can find that person's bioassay result. And again, in context, almost all of these RWPs were plutonium-based, which, as I think we'll get to later, we didn't find much of a problem with the plutonium program. We think because it was their primary activity, the vast majority even, that they kept a close eye on it. The question is, some of these sort of laboratory experiments and such with exotics, which did occur at LANL, whether those were actually monitored appropriately. So, --

CHAIR BEACH: Right, right.

MR. BARTON: Yeah. I mean, we'll get to it, I think, later in 103. But yeah, we don't really have a problem with plutonium. We think that's going to be fine. And see --

CHAIR BEACH: Okay.

MR. BARTON: -- if NIOSH --

CHAIR BEACH: Fair -- fair enough.

MR. BARTON: -- elects to construct a co-explorer model. Okay.

CHAIR BEACH: Gotcha. Thank you. Thank you.

NIOSH/DCAS Presentation: "NIOSH Response to SC&A'S Review of Remaining LANL SEC-00109 Internal Dose Issues for 1996-2005" (April 23, 2025)

CHAIR BEACH: Tim, are you going to present at this -- now?

MR. ADLER: Yeah, I could --

DR. CARDARELLI: Josie, --

MR. ADLER: Oh, hey, John. Go ahead.

DR. CARDARELLI: Yeah. I just wanted to jump in here real quick and give a --

CHAIR BEACH: Oh. Go ahead, Joe (sic) --

DR. CARDARELLI: -- for Tim, if you don't have a -- objections to that, Josie.

CHAIR BEACH: No, no, not at all.

DR. CARDARELLI: So, I'm going to be running --

CHAIR BEACH: John, go ahead.

DR. CARDARELLI: -- the PowerPoint slide for Tim, so I'm going to share my screen here, once I figure out which one I'm going to share. I think it's this one.

MR. ADLER: It's the -- yeah, great.

DR. CARDARELLI: And with the discussion, this is kind of one big, large PowerPoint presentation. And I think, Tim, let's just go through to the point where we covered reports 101 and 102. And when you get to the summary slides for 103, I think we should take a break there and have a discussion on that before we get into any 103 discussions.

Is that -- Josie, is that okay?

CHAIR BEACH: That's what I was going to suggest also, John. Thank you.

DR. CARDARELLI: Okay. And I just wanted to briefly make a note before we get started that, obviously, this is the first time -- this is the first

time I'm engaged with the LANL site. I've been newly appointed as the DCAS site lead, so I'm getting up to speed as well as some other members as well. Tim has been fairly involved over the past several years, so we've asked him -- since he knows a little bit more of the history, will I get brought up to speed on this -- and he's graciously agreed to give the presentation on my behalf.

So, Tim, thank you for that.

MR. ADLER: Sure.

DR. CARDARELLI: And when we get to 103, I think that I would look forward to having discussions before we go further, Josie. And that's really all I have to say at this point.

CHAIR BEACH: Okay. So, you're -- you're thinking we'll have discussions on 101, 102, and then you'll get -- move to the slides for 103 because this is your presenting time also, correct, or?

DR. CARDARELLI: Yeah. Because we do --

CHAIR BEACH: Okay.

DR. CARDARELLI: -- not have a presentation to give all the details about 103, I wanted to --

CHAIR BEACH: Oh. Okay.

DR. CARDARELLI: -- at least have a discussion about whether or not it would be appropriate for SC&A to give their response to 103 before we have a chance to give our presentation on 103.

CHAIR BEACH: Oh. Okay.

DR. CARDARELLI: We do have a very high level, 30,000 foot, as was mentioned earlier, presentation about 103, which may be helpful and -- and

set the stage for the next meeting where we might get into the details.

CHAIR BEACH: Okay. And I expect there's going to be a couple more documents that you guys have released that SC&A hasn't been tasked to review, and those all pertain to 103. So, I feel like we'll have some tasking and better able to handle 103 at our next meeting. So -- so, I'm understanding --

DR. CARDARELLI: Okay.

CHAIR BEACH: -- of what's happening.

DR. CARDARELLI: Okay.

CHAIR BEACH: Okay. We'll let you start, Tim. Thank you.

DR. CARDARELLI: It's all yours, Tim.

MR. ADLER: All right. Thanks, John.

Yeah. Hello, everybody. As noted, my name is Tim Adler. I'm now the lead for ORAU Team. I took this over actually about a year and a half ago, John, succeeding Mike Mahaffey (ph). And as John said, he has just now very recently succeeded Brant Ulsh as the lead for DCAS, so I'm helping out.

Let's go to the next slide, John.

Okay. Though the primary focus of today's discussions are on reports 101, 102, and 103, I do think it's worth noting that other reports exist and also play roles in NIOSH's dose reconstruction feasibility conclusions. These documents include report 107. And I guess the title isn't on this slide, but it's "Dose Estimation for Intakes of Exotic Radionuclides at the Los Alamos Neutron Science Center, the LANSI, from 1996 to 2005." And then two so-called weight-of-evidence memos that both have a focus on technical

area 53.

As previously mentioned, SC&A's review of the three reports produced a total of about eight findings and 10 observations. All these documents should be available on CDC and NIOSH websites.

Next slide, please. Are we there? Yeah.

This slide is simply a listing of the actual complete report titles along with their issue dates. Note that going forward in this presentation, I'm simply going to be referring to the said of reports as 101, 102, and 103, dropping off the "O" in front. I'm not sure what that's for anyway, but let's just go with those.

Next slide, please.

Okay. As John mentioned earlier, this presentation was configured to be an overarching reorientation of sorts of where we left off and a summary of where NIOSH -- NIOSH now stands on the evaluation of Petition 109 at this point. I would say the altitude view level of our presentation is maybe a bit above Joe's and Bob's, maybe even a little above 30,000 presentations, but I do hope it captures the essence of the reports, SC&A's views, and NIOSH's positions on their views. Certainly observation-specific and finding-specific responses are currently available in NIOSH's response document to SC&A's review, which is on the CDC's NIOSH website.

So, for each of the subject reports, I guess now just 101, 102, but we can do 103, as John mentioned, each of these reports being discussed, we have assembled just three slides to present. The first slide, like this one for 101, is intended to just very briefly summarize the goal of the subject report, the data and information utilized in the report, and the report's

conclusions. You'll see soon the second slide summarizes, for lack of a better term, the theme or themes of SC&A's review of the port -- the report.

In this presentation, we aren't getting so granular as to list each specific SC&A observation and finding, as SC&A has now done, just the overarching points. With SC&A having presented first today, I suppose everyone can judge for themselves if we've done a reasonable job of summarizing their specific observations and findings. The third slide for each report will briefly summarize NIOSH's positions and responses to SC&A's review as -- as we've captured them.

So, staying on this slide and moving this discussion along, the goal of Report 101 was to assess the ability to bound 1996 to 2005 doses from exotic radionuclides at 100 millirem per year committed effective dose. The report focused on Technical Areas 3, 48, and 53, which were areas known to have involved exotic radionuclides. Surface contamination survey and air monitoring data were used. We should have noted on the slide routine survey and monitoring data. Additionally, we assessed and discussed LANL's workplace radiological controls.

The Report 101 effort concluded that routine contamination in these three technical areas were controlled and that the radiological control program was structured and implemented such that the weight of evidence indicates doses to unmonitored workers can be bounded at 100 millirem per year CED.

Next slide, please.

Okay. SC&A's review of Report 101. SC&A's review of this report identified three findings and three observations, as you saw earlier. As

mentioned earlier, without presenting each specific issue in entirety, SC&A commented that Report 101 does not assess data randomly from all facilities or from clearly specified job types. SC&A also states that the report does not address bioassay completeness and does not confirm that LANL adequately assessed internal exposure potential to exotics at 100 millirem per year CED.

SC&A does, however, agree that the reported sampling surveys indicate no likely exposure potentials above 100 millirem per year CED for the three targeted areas were likely. The footnote on the slide is just an acknowledgement that SC&A reviewed Rev. 0 of the report and 101, you know, versus Rev. 1, but their conclusions don't appear to materially have been affected.

All right. Now to slide 6.

Okay. Our response to their review of that Report 101, to summarize NIOSH's position here, NIOSH concludes that LANL implemented the necessary administrative and engineering controls to determine when and what type of internal dose monitoring was required to comply with the 100 millirem per year CED monitoring threshold requirement at all site areas. NIOSH's position is based collectively on the weight of evidence obtained from thousands of captured data and documents, interviews with LANL radiation protection personnel, and the absence of direct evidence to the contrary.

If there are no questions, we'll go on to 102. Any comments? Okay.

CHAIR BEACH: So, I've got a -- I've got one question.

MR. ADLER: Okay.

CHAIR BEACH: So, you're basing this on the program, and trust me, I didn't get a chance to read this when it was delivered just this morning. Is there anything backing up the program? Are there results?

MR. ADLER: The program --

CHAIR BEACH: Are there interviews? You just -- you just said there was interviews.

MR. ADLER: Yes.

CHAIR BEACH: Are there notes that can be reviewed?

MR. ADLER: Yes. Of --

CHAIR BEACH: Are there bioassay data that --

MR. ADLER: Yes.

CHAIR BEACH: -- backs this up?

MR. ADLER: Yes. There's a lot of that information available. A lot of it has been incorporated, or at least described, in our response to SC&A, which is, you know, their -- their paper was 103 pages or something. I think ours was 55 or something like that. It goes into quite a bit of detail.

CHAIR BEACH: Right.

MR. ADLER: And you can find that there. We're not really quite ready --

CHAIR BEACH: Okay.

MR. ADLER: -- to go into that level of detail right now.

CHAIR BEACH: Okay. So, that's to come. Thank you.

MR. ADLER: Yeah, that can come.

CHAIR BEACH: Go ahead.

MR. ADLER: Okay. So, where are we now? We were at -- oh, 102.

Let's go to 102.

Okay. Summary of 102, focusing on plutonium bioassay programs, this report analyzed several available data sets searching for evidence that the most highly exposed workers were not monitored. Though not detailed on this slide, it's worth noting that, as Joe mentioned in his introductory overview, and then Bob again, this report stemmed from a 1999 audit of LANL's bioassay program that identified deficiencies which were of regulatory concern. The audit prompted questions of whether identified deficiencies might imply data inadequacy and incompleteness issues that might be significant enough to impair development of a plutonium co- -- of a plutonium co-exposure model.

So, for Report 102, after analyzing six health physics-related data sets to assess bioassay data completeness, NIOSH found that plutonium bioassay data for the assessed period included a significant portion of the most highly exposed workers. NIOSH concluded that the available plutonium bioassay data were adequate to construct a co-exposure model for plutonium.

Next slide, please, John.

Okay. SC&A's review of Report 102, 30,000-foot level. SC&A's review of Report 102 identified three findings and three observations. Their primary concerns were regarding how NIOSH determined whether submitted bioassay samples were compliant with LANL's bioassay program requirements, which could potentially impact data completeness. Despite their observations and findings, NIOSH wrote that they believe an appropriate co-exposure model for plutonium may be found acceptable, but such a determination would be a matter of professional judgment for LANL

Work Group and the Board as a whole. SC&A stated that they were also of the opinion that Report 102 conclusions are not transferable to nonroutine job-specific samples, sampling for exotics.

Next slide, please.

NIOSH's response to their review, to SC&A's review, NIOSH's positions are that a bounding plutonium co-exposure model is feasible, as NIOSH found no evidence that bioassay data from workers with the highest exposure potential are insufficient to develop a bounding co-exposure model. Additionally, NIOSH agrees with SC&A that the conclusions presented in Report 102 are not transferable to exotics. The reference citation you see in that last bullet is pointing to a 2012 Work Group transcript where this topic was previously discussed.

Now, at this point, we would be heading into a Report 103 summary, so do we want to do that now or not, at the same sort of level, the same sort of format?

CHAIR BEACH: Yeah. Any questions from the Work Group members so far on 101, 102 for NIOSH?

MEMBER MARTINEZ: I have a question. This is Nicole.

CHAIR BEACH: Hi, Nicole. Go ahead.

MEMBER MARTINEZ: Thank you. I -- I think I might be missing something maybe between 101 and 102, because I was -- as I was listening to 101, it seemed like we're looking for -- the idea is exotics and that bioassays were conducted for plutonium where you might also catch the exotics. Is that the idea?

MR. ADLER: No. Just the completeness of bioassay sampling.

MEMBER MARTINEZ: With the eventual trying to bound exposure to dose from exotics or just in general?

MR. ADLER: Let's say the relation is --

MEMBER MARTINEZ: Where -- where do (indiscernible).

MR. ADLER: That it's -- it's at least a statement, and Nancy wants to chime in on this, Nancy Chalmers, and correct me if I'm wrong, but it's at least an assessment of the program's ability to prescribe monitoring properly and monitor the highest exposed people and prove that that happened. And so, it's more of an -- as far as exotics go, I would say it's more of an indication of program integrity and whether or not they could.

MEMBER MARTINEZ: Okay. Okay.

MR. ADLER: -- weight of evidence.

MEMBER MARTINEZ: So, that's where that (audio drop). Okay. Thank you.

MR. ADLER: Uh-huh.

CHAIR BEACH: And Nicole, you're going to hear more about 10 -- exotics in the following reports.

How does -- so, this is not an in-depth report or presentation of your Report 103, correct?

MR. ADLER: Correct.

CHAIR BEACH: So, it's going to be an overview? So, I guess, let's keep that in mind as we move forward that we will hear this. SC&A will go through theirs. And then let's -- after both of those reports are done, let's talk about moving forward because I believe there's -- there'll be some more work to do. So, this is giving us a just a 30,000 foot, right, --

MR. ADLER: Correct.

CHAIR BEACH: -- and not specifics? Okay.

MR. ADLER: Correct.

MEMBER LOCKEY: Josie, can I ask a question?

CHAIR BEACH: Yeah, of course, Jim.

MEMBER LOCKEY: Would you go back one slide for me? Go back one. Where you say nobody -- there. A hundred -- 100 millirem per year CED. Compare -- okay. So, it -- when you looked at the exposures data at this facility during this time frame, were there workers who exceeded that?

MR. ADLER: Exceeded 100 millirem?

MEMBER LOCKEY: Yeah.

MR. ADLER: I believe there were.

Rich, are you on? Can you answer that question?

MR. RICH UNKNOWN: Yes, I'm on, but I do not know the answer to that.

MR. ADLER: No. Okay.

MR. RUTHERFORD: I can -- this is, this is -- this is LaVon Rutherford. I can answer that. There -- there were individuals that exceeded 100 millirem, a few individuals, but those individuals were monitored.

MR. ADLER: Monitored, yeah.

MR. RUTHERFORD: The idea -- yeah, the idea was to look at individuals that were not monitored. So, we would look at -- in 101, we would look at the contamination and air monitoring data to see, you know, what was the potential for individuals exceeding 100 millirem in those areas, so if people were in those areas and were not monitored. So, yes, there

were people that exceeded 100 millirem. Not very many, if you look at the data, but those individuals were monitored.

MEMBER LOCKEY: LaVon, you might have presented that data in the past. I can't remember back to 2022, but if you look at the whole workforce, what percentage would exceed that?

MR. RUTHERFORD: Well, if you looked at -- I, you know -- I don't remember that, you know. And like you said, I probably did present that in 2022, and I don't remember. But there was very few individuals that exceeded 100 millirem for internal exposure at that site.

MEMBER LOCKEY: Over that time period?

MR. RUTHERFORD: Yes, that were monitored.

MEMBER LOCKEY: That were monitored. That's what I'm asking. That was monitored. Okay. Thank you.

MR. BARTON: This is Bob Barton. Can I comment on that? Because I think we're --

CHAIR BEACH: Yes.

MR. BARTON: -- getting a little far afield on what the actual issue is. The issue is the potential for unmonitored workers. So, the number that exceeded that, I mean, we -- we don't know what we don't know because they weren't monitored. So, that -- that's really the question. And --

MR. ADLER: I agree, Bob.

(Whereupon, multiple attendees speak simultaneously.)

CHAIR BEACH: Thanks, Bob.

MR. BARTON: -- smoking gun. Okay. Thank you.

CHAIR BEACH: Thanks, Bob. I was thinking the exact same thing, but

I'm glad you jumped in.

Jim, anything else?

MEMBER LOCKEY: No. The reason I asked the question is it gives me an overall picture of the health risks at the facility from a scientific perspective. That's -- that's what I was trying to get a handle on.

CHAIR BEACH: Yeah.

DR. CARDARELLI: Dr. Lockey, this is John Cardarelli. I just wanted to add a few things. This was presented -- it comes from the presentation that LaVon gave back in 2022. There was well -- almost over 100,000 air sampling and surface sampling results, and 98 to 99 percent of those results were all below the threshold, which would have likely resulted in any potential dose close to the 100 millirem per year committed effective dose threshold. So, the majority of -- so, that demonstrates the -- the comprehensiveness of the surveys, which is one of the arguments used in our weight of evidence.

Then another overarching comment I want to make before we move on is that some of these same arguments being presented at the LANL Work Group were also presented at the SRS Work Group, and our position remains the same. There was a big, nice report that I would recommend the Work Group look at where the lack of compliance, if there is such, which there may have been, does not indicate that we can't do a dose reconstruction. And lack of completeness doesn't mean you can't do a dose reconstruction. In fact, if we had 100 percent complete data, we wouldn't need a co-exposure model.

So, as long as we can show, this is our position, that the highest

exposed potential population was exposed and properly monitored, we can do a dose reconstruction and do proper bounding techniques. And you'd take that logic to the worst case. If it's the one person out of the thousands was the highest exposed and we have that monitoring data, we could apply that to the other remaining workers. Now, that's not the case here in Los Alamos either, but the logic still applies. And I just wanted to give that concept of -- of compliance versus dose reconstruction capability. That's it.

CHAIR BEACH: John, it -- John, this is Josie.

Is that for plutonium and exotics or just plutonium?

DR. CARDARELLI: I think it would -- it -- it -- the concept would apply to all.

MEMBER MARTINEZ: This is Nicole. Just real quick, I just wanted to mention that I'm conflicted at Savannah River, so that's not for me.

CHAIR BEACH: Okay. Thanks, Nicole.

MEMBER LOCKEY: Thanks, John. Appreciate that.

DR. CARDARELLI: Sure.

ORAUT-RPRT-103

NIOSH/DCAS Presentation: "Review of Potential Exposure to Exotic Radionuclides Using Radiological Work Permit Data at Los Alamos National Laboratory, Revision 00" (August 15, 2022)

MR. ADLER: So, John, did we want to stop at this point and not finish off this level of discussion for 103 or what?

DR. CARDARELLI: Well, Josie, I think you said you wanted us to give the -- the three slides on --

CHAIR BEACH: Yeah.

DR. CARDARELLI: -- 103 and then have --

MR. ADLER: Okay.

CHAIR BEACH: Yeah.

DR. CARDARELLI: -- even though we haven't given the Work Group our full assessment of 103?

CHAIR BEACH: Well, yeah, I'm okay for just the informational aspect of it, and we'll have to assign some reports for SC&A to task, and I'm assuming you'll do a full report at the next meeting also. So, --

DR. CARDARELLI: Yeah, we can --

CHAIR BEACH: -- unless somebody objects, I'm okay with just hearing the three slides that you have already.

DR. CARDARELLI: Okay.

MR. ADLER: Okay.

CHAIR BEACH: All right. Go for it.

MR. ADLER: All right. Let's find them. Okay. Summary of Report 103. This report supplements 101 in that it also assesses the ability to bound 1996 to 2005 doses from exotic radionuclides at 100 milligram per year. That introductory statement should actually say 100 milligram per year CED. Instead of assessing contamination survey and air monitoring though, as Report 101 focused on, 103 instead presents detailed evaluations of 24 radiation work permits.

Like 101, the assessed information, the RWPs in this case, were from Technical Areas 3, 48, and 53. As mentioned those were known to have some association with exotic radionuclides. The overarching goal of this

assessment was to determine if LANL monitored and assessed work activities such that they could identify which workers required bioassay monitoring per the 100 millirem per year CED monitoring threshold requirements.

As part of the RWP assessment process, NIOSH compared pre-job radiological protection requirements to final post-job reviews as well. The RWP -- RWP evaluation effort led NIOSH to conclude that LANL health physic personnel monitored workers for routine and non-routine radiological work conditions as required to comply with the 100 millirem per year CED threshold requirements.

Next slide, please.

SC&A identified three observations and one programmatic finding for Report 103. They reviewed the 24 RWPs within that report plus an additional 10 RWPs associated with the subject period of interest, '96 and 2005. SC&A's primary comments on the report were that there are apparent discrepancies between monitoring specified by the RWPs and actual monitoring performed. The report doesn't address nonroutine bioassay completeness, and it doesn't confirm that LANL adequately assessed internal exposure potential for exotics -- to exotics at 100 millirem per year CED.

Next slide, please.

Okay. Now, the NIOSH response is that their positions are as follows: There are no confirmed discrepancies in monitoring specified by the RWPs and the actual monitoring performed because worker signatures on RWP acknowledgment sheets simply indicate that the signing workers have read and understood the RWP, not that they actually performed the work under that RWP. In addition, various monitoring criteria must also be met for

bioassay and contamination follow-up monitoring, and these criteria can be found in LANL's technical basis document.

That's -- that's about it. No, wait. There was one other thing I was going to say. NIOSH's position, again, is that the subject reports plus additional information such as that document and the information weight-of-evidence memos demonstrate that LANL implemented the monitoring program that ensured workers requiring monitoring were monitored and unmonitored workers were unlikely to receive 100 million per year CED.

So, that is our conclusion. Reports 101, 102, 103 conclude that dose reconstructions can be completed with sufficient accuracy to support the EEOICPA compensation program.

CHAIR BEACH: Okay. Thank you, Tim. And thanks for jumping in. We appreciate that.

MR. ADLER: Sure.

SC&A Presentation: "SC&A Draft: SC&A Review of Remaining Internal Dose Issues for the LANL SEC-0109 Addendum Period 1996-2000" (April 12, 2024)

CHAIR BEACH: Rashaun, I think at this time we should save the 103 report that SC&A has. It's kind of getting the cart before the horse, and I think we should move into tasking and schedule another meeting. And if you don't agree, let me know what you're thinking.

DR. ROBERTS: No, that seems fine to me, provided the -- the Work Group agrees that that is the way to go.

CHAIR BEACH: Yeah, I think everybody --

MEMBER MARTINEZ: (Inaudible.) CHAIR BEACH: -- has --

MEMBER MARTINEZ: -- you'll get a (inaudible). Yeah. Thanks, Josie.

WORK GROUP DISCUSSION AND PATH FORWARD

CHAIR BEACH: Yeah. So, we do have two reports and they deal -- they're 103 -- so, the first one that SC&A has not reviewed is Report 107, "Dosed Estimation from Intakes of Exotic Radionuclides at LANL 1996 to 2005." That report came out on 9/15/23, so we need to task that to SC&A. And then the memo NIOSH put out February 22, 2024, the weight of evidence supports NIOSH ability to bound LANL TA-53 doses for 1996 to 2005. So, I think those two are important.

And then focusing on NIOSH answering the findings for Reports 101 and 102, hold off for any findings that were in SC&A's Report 103 at this time until after -- unless you want to incorporate it -- now, I -- never mind. Let's not do that. So, move forward with NIOSH completing their work for 103 and then scheduling a meeting. Any other ideas or comments on that?

MEMBER LOCKEY: Josie, what did you say about NIOSH reviewing 101 and 102 again?

CHAIR BEACH: The findings. So, they should be looking at the findings that Bob reported out for Report 101 and 102. Because we're at the step now where we -- we were presented from NIOSH in March of '22, Reports 101 and 102. So, this is our first meeting of the findings from those two reports. And it's clear that NIOSH hasn't really had a time -- had a chance to individually look at each one of those findings and observations and answer those.

DR. CARDARELLI: Hey, Josie, this is John Cardarelli.

CHAIR BEACH: Yep, hey, John.

DR. CARDARELLI: Some basic questions here. Are -- are the findings and observations for Report 101 and 102, have those been entered into the BRS, the board review system?

CHAIR BEACH: I have not. And Bob, do you know if that's been done?

MR. BARTON: Hi, Josie. I -- I can't verify that. I know we're really working to try to get that thing up to speed.

CHAIR BEACH: Okay.

MR. BARTON: As you're aware, that's kind of a new module.

CHAIR BEACH: Right.

MR. BARTON: So, --

DR. CARDARELLI: Right. Right.

MR. BARTON: -- nothing --

CHAIR BEACH: Well, and I -- I haven't checked it because I haven't gotten access to the -- the new site yet. So, I need to work on that with Rose.

MR. BARTON: Okay. Well, we do have --

CHAIR BEACH: So, I --

DR. CARDARELLI: I'm sorry, Josie. Go ahead.

CHAIR BEACH: Oh, no, that's okay.

DR. CARDARELLI: I would say we do already have responses that we could put in there once they're entered because we've already written responses to 101, we've written responses to 102, and we have responses to

103. So, for the next meeting, we'll get the BRS hopefully up and updated and all that will be there. The 107 and the weight of evidence, obviously when those tasks are done, we will respond when we get those responses or reviews from SC&A.

CHAIR BEACH: Okay. So, moving forward, we will expect a report from NIOSH with details answering the findings for Report 101 and 102, and then a presentation on 103, correct?

DR. CARDARELLI: Moving forward, I think we've already -- I thought we already shared our detailed findings, but we can put those together pretty quickly. We've already touched on them here. But yes, moving forward, we would present our 103 in detail. SC&A could then move forward, present their review of that, and then we could follow up with our responses to their review on Report 103. And --

CHAIR BEACH: Okay.

DR. CARDARELLI: And depending on when the next meeting is and how quickly a review can be provided on Report 107 and/or the weight of evidence. We may even be able to add responses to their review as part of the agenda in the next meeting, and that would be dependent upon when that meeting is scheduled and how quickly those products can be produced.

CHAIR BEACH: Okay. I --

MR. ADLER: Sorry, Josie. Go ahead.

CHAIR BEACH: No, go ahead.

MR. ADLER: This is Tim. I just want to confirm to you, John, and everybody that yes, we have provided a document. It's giving you a, you know, blow by blow, observation by observation, finding by finding response

to SC&A's review of those three reports. And it's on the website.

DR. CARDARELLI: Yes.

MR. ADLER: And --

CHAIR BEACH: Well, that --

MR. ADLER: It's 50-something pages, you know, but we have that. We have not presented those in that level of detail --

CHAIR BEACH: Okay. So, can we -- can we add that to the agenda for the next meeting and make that available? I don't believe I've seen that report.

MR. ADLER: Okay. It's there.

DR. CARDARELLI: You can definitely add it to the agenda and --

CHAIR BEACH: Okay.

DR. CARDARELLI: -- present that.

CHAIR BEACH: Okay. And can it be -- can it be forwarded to the Work Group? Can it be emailed since I need an email to my CDC?

DR. CARDARELLI: It's on our website, I believe. So, we can send the Work Group the link to the public website where --

CHAIR BEACH: Okay.

DR. CARDARELLI: -- that report exists.

CHAIR BEACH: Okay. And then, Rashaun, can we look at an April time frame? Does that give everybody sufficient time to -- to have a full meeting? Rashaun, did you --

MEMBER MARTINEZ: April --

DR. ROBERTS: -- like, my --

MEMBER MARTINEZ: -- whatever.

CHAIR BEACH: Go ahead.

DR. ROBERTS: I'm sorry, somebody was speaking, but I --

CHAIR BEACH: (Inaudible) yeah.

DR. ROBERTS: -- was going to say -- ask NIOSH, do you feel that that may be sufficient time to be able to present if we --

DR. CARDARELLI: Well, I think --

DR. ROBERTS: -- look at the April --

DR. CARDARELLI: I -- I think for -- for sure on that one presentation that's already up on the web, we will be prepared for that. Now, our ability to respond to the comments on Report 107 and the weight of evidence --

DR. ROBERTS: Right.

DR. CARDARELLI: -- would be dependent on how quickly SC&A can get us those.

DR. ROBERTS: Right.

CHAIR BEACH: Well, typically we would have a meeting, and they would present that also and then move on to those.

DR. CARDARELLI: Fair enough.

UNIDENTIFIED SPEAKER: Presented on 107?

DR. CARDARELLI: We -- I don't think we presented on 107 to the Work Group yet either. So, --

CHAIR BEACH: No, you have not.

DR. CARDARELLI: Yeah, I think we'd want to present the 107 and the weight of the evidence to the Work Group. And then if SC&A has the responses, they can certainly add that to put -- that meeting, and then we will follow up on the following meeting on our responses to their comments.

CHAIR BEACH: Okay.

DR. ROBERTS: So, are we thinking early, mid, or late April?

CHAIR BEACH: I was hoping for the first full week, but if that doesn't work...

MEMBER LOCKEY: First full week of what, Josie?

CHAIR BEACH: The first full week of April, but that's just because of my availability. But Tim, was that you or John talking about mid-April?

DR. CARDARELLI: That was me, and I was hoping for late only because we have a new review process that we are getting ourselves familiarized with that has significantly extended the review time.

CHAIR BEACH: Okay.

DR. CARDARELLI: Am I correct, Lori?

MS. MARION-MOSS: That's correct.

CHAIR BEACH: Okay. How does April 24th look? Does anybody have objections to that date?

DR. CARDARELLI: Friday, I --

(Whereupon, multiple attendees speak simultaneously.)

CHAIR BEACH: Yeah.

DR. CARDARELLI: I don't have a (audio drop) a Friday.

UNIDENTIFIED SPEAKER: When's Easter?

UNIDENTIFIED SPEAKER: We're looking up when Easter is. Hold on.

CHAIR BEACH: Yeah.

DR. CARDARELLI: Yeah.

CHAIR BEACH: Easter is the 6th. Easter Monday. Oh, it's the 5th. So, that's a ways away from there.

DR. ROBERTS: So, does the 24th work, or should we be looking at an alternative?

MEMBER LOCKEY: Jim Lockey. It works for me.

DR. CARDARELLI: John Cardarelli, --

MEMBER MARTINEZ: Nicole, it works for me.

DR. CARDARELLI: Cardarelli, it works for me.

DR. ROBERTS: Okay. Well, if there are no objections, we can -- we can schedule that tentatively, you know, provided we can get the approvals and everything that's -- that's needed in sufficient time. And the start time could be 11:00 a.m. Eastern again, if there's no objections.

CHAIR BEACH: Works for me.

DR. ROBERTS: Okay. Great.

CHAIR BEACH: So let's -- let's try to come up with an agenda ahead of time and what --

DR. ROBERTS: Yes.

CHAIR BEACH: -- what's going to be done and ready. And then the tasking, are we so moved on the tasking that I mentioned for SC&A for those two --

MEMBER LOCKEY: I so move.

CHAIR BEACH: -- reports, or actually the three. I guess, three reports.

MEMBER LOCKEY: I move that they be tasked with those three reports. Jim Lockey.

MEMBER CLAWSON: Thank you, Jim.

DR. ROBERTS: Hi, Josie, would you mind just sort of itemizing the

three reports again?

CHAIR BEACH: Yeah, I'm gonna itemize two of them, and then John will have to jump in with the third one since I don't have it in front of me. So, the ORAUT Report 0107 and then the memo of February 22, 2024. Those both pertain to 103.

And then John, what was the third one that you said is available?

DR. CARDARELLI: Well, it's our overarching response that's on the web to 101, 102, and 103, but the three presentations that NIOSH will work to provide on April 24th is the full report on 103, the full report on 107, and the weight of evidence that was mentioned is 2024. So, we'll present that to the Work Group and then we can hear SC&A's comments to those, and then we will determine from there. That -- that would be a pretty good lengthy meeting, I think.

CHAIR BEACH: Okay. And SC&A, Bob, is -- is -- that all sound okay for you guys?

MR. BARTON: Whatever the Work Group wants. If I may make a comment for the good of the group, you know, we're trying to put together an SEC issues Work Group which is gonna be very, very heavily involved with these concepts of co-exposure models with the highest individuals and weight of evidence that -- that's true. So, and I think that will hopefully occur before April, but that may inform discussions a great deal at that time.

CHAIR BEACH: Is that -- Bob, is that the SEC meeting?

MR. BARTON: Yeah, that's --

CHAIR BEACH: -- we scheduled already?

MR. BARTON: That's right.

CHAIR BEACH: Okay.

MR. BARTON: Yeah, it's the --

CHAIR BEACH: Well, that --

MR. BARTON: -- 2023.

CHAIR BEACH: -- that's scheduled --

DR. ROBERTS: Well, it's --

CHAIR BEACH: Yeah, it's scheduled for February.

DR. ROBERTS: Okay. But it's tentatively scheduled. We have to get -

CHAIR BEACH: Right.

DR. ROBERTS: -- approval for --

CHAIR BEACH: Right, right.

DR. ROBERTS: -- the meeting, --

CHAIR BEACH: Right, yeah.

DR. ROBERTS: -- but the tentative date, I believe, is February 11th.

CHAIR BEACH: Okay. And I haven't seen documents or anything for that yet, so.

DR. CARDARELLI: Josie, this is --

CHAIR BEACH: Yes?

DR. CARDARELLI: -- John. I wanted to -- instead of one thing on the weight of evidence, we actually have two memos associated with the weight of evidence, and we will combine those two in one -- in one presentation. So, if -- if -- for clarity, we'll just, we will present both weight of evidence documents --

CHAIR BEACH: Okay.

DR. CARDARELLI: -- in one presentation.

CHAIR BEACH: And can you make sure that those documents are emailed to the Work Group?

DR. CARDARELLI: Yes, I --

CHAIR BEACH: The -- the ones that are --

DR. CARDARELLI: -- will.

CHAIR BEACH: -- available now? Okay.

DR. CARDARELLI: Yes, I will.

CHAIR BEACH: And most of us don't have any access to anything other than our emails, so keep that in mind until we have that cleared up with the new site. I don't even know what you're calling it now, where you're keeping your documents.

(Whereupon, multiple attendees speak simultaneously.)

CHAIR BEACH: ORAUT? ORAUT, okay. Thank you, LaVon.

DR. CARDARELLI: Yeah. We'll get those documents to you.

CHAIR BEACH: Okay.

MEMBER LOCKEY: It's called the special place.

CHAIR BEACH: Yes. Yeah, I tried to get access, but I need to get my password fixed. So, anyway. Anything else for the good of this meeting or comments moving forward?

Rashaun, I think we are ready to adjourn.

Thank you, everyone, for being here, being back.

MEMBER LOCKEY: Nice to hear everybody.

DR. ROBERTS: Yes, thank you.

CHAIR BEACH: All right. I say we adjourn. Any seconds?

MEMBER LOCKEY: Second.

CHAIR BEACH: Okay. Thanks, everybody.

(Whereupon, the meeting was adjourned at 12:37 p.m. EST).