US Department of Health and Human Services

Centers for Disease Control

National Institute for Occupational Safety and Health

Advisory Board on Radiation and Worker Health

Los Alamos National Laboratory Work Group

Thursday, November 29, 2018

The Work Group convened via teleconference at 10:30 a.m. Eastern Time, Josie Beach, Chair, presiding.

Present:

Josie Beach, Chair
Bradley P. Clawson, Member
James E. Lockey, Member
Genevieve S. Roessler, Member

Also Present:

Ted Katz, Designated Federal Official
Nancy Adams, NIOSH Contractor
Terrie Barrie
Bob Barton, SC&A
Catherine Christoffersen
Andrew Evaskovich
Joe Fitzgerald, SC&A
Jenny Naylor, HHS
Christopher Miles, ORAU Team
Jim Neton, DCAS
Lavon B. Rutherford, DCAS
Dan Stempfley, ORAU Team

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Proceedings

(10:30 a.m.)

Welcome and Roll Call

Mr. Mr. Katz: So, welcome, everyone. This is the Advisory Board on Radiation Worker Health. It's the Los Alamos National Laboratory Work Group.

And some preliminaries and then I'll get to roll call. But, the SEC petition we're discussing today, material related to that.

For the background materials for the discussion today are posted on the NIOSH website. If you go to this program, schedule and meetings, today's date you'll find I think all the materials posted there.

There's a very brief summary, just sort of handout just to get things rolling from the dose reconstruction and SC&A that's not posted there, but you'll hear it orally. So, it's probably not necessary.

And we also ask everyone who's on the line because we probably have some people on the line from the public, too, to please keep your phones muted for this call, if you don't, the petitioner will have an opportunity to comment later, but otherwise, the public shouldn't be speaking at all and most of the public then can just mute your phones. Press *6 you don't have a mute button to mute your phone, *6. And to take your phone off of mute, you also just press *6 again.

And, please, no one put this call on hold at any point because that causes grief for everybody on the call. So, hang up and dial back in if you have to leave for a piece.

Okay, that probably takes care of preliminaries, so, for the roll call, for Board Members, the Chair is now chaired by -- this Board is -- this Work Group is chaired by Josie Beach and has, Brad Clawson, Jim

Lockey and Gen Roessler on it.

None of the Board Members have conflicts of interest, so that doesn't need to be addressed for them. But they're all in attendance. And, for the rest of the roll call, please, people, speak to conflicts of interests when we get to you.

Mr. Katz: Okay, welcome to everybody. And, actually, you're not late, we're just getting started. So, we've gone through roll call and some preliminaries, Catherine, I've asked and maybe Terrie if you were late too, to listen background noise, please mute your phones.

Members of the public should have their phones muted the whole time except for the petitioner who can keep it muted until it comes time for the petitioner comments.

And, if you don't have a mute button, press *6 to mute your phone; *6 to come off of mute.

So, appreciate you doing that, thanks.

And with that, Josie, it's your meeting.

Chair Beach: Okay, thank you, Ted. And, welcome everybody.

We're going to go through -- SC&A is going to give us a brief status, I know Ted mentioned that.

And then, NIOSH will go through their White Paper with comments from NIOSH's -- or excuse me, SC&A's White Paper.

Questions from the Board Members, of course, are always welcome and then we'll have a time for petitioner's comments.

And then, we'll move to path forward and maybe some recommendations for the December 4th meeting.

So, Joe, if you're ready, I'll go ahead and turn it over to you for the -- thank you for preparing that brief status update. It's been a while since we've met.

SC&A Status Brief

Mr. Fitzgerald: Yes, thank you. Good morning.

This is Joe Fitzgerald. For those who don't have my one-pager, I'm going to go through that. And, literally, it's sort of a background piece on the milestones. There actually has been a lot going on for the last year and a half.

So, I think it's useful to revisit what's been going on and to bring it to the present.

And, I want to begin with the last SEC Class that was defined. That was back in 2012 for all employees at Los Alamos, January 1st of 1976 to December 31st of 1995 recommended by the Board in October of that year made effective by HHS in January of 2013.

And, I just want to mention from the Board's letter, the key basis for that SEC. And it was the National Institute of Occupational Safety and Health review of all monitoring data as well as available process and source term information for this facility, meaning Los Alamos, found that NIOSH lacked the sufficient information necessary to complete individual dose reconstructions with sufficient accuracy for internal radiological exposures to fission and activation products and various other radionuclides of concern.

Which colloquially, we're calling sort of that entire group exotics. So, again, that's sort of a shorthand for the mixed activation, mixed fission products as well as several other exotics such as curium that were cited at that time.

So, that was the scope in 2012. Since then, on March -- in March of 2017, jumping quite a bit ahead, SC&A, we issued a memorandum report to the Work Group

at the Work Group's request in terms of open Site Profile issues.

And, the notion was to begin dispositioning those but with the April 2017 ER addendum, we -- the Work Group decided to put those aside for now and focus on the SEC.

So, again, in April 2017, shortly thereafter, NIOSH did, in fact, issue its Evaluation Report addendum for the SEC-00109 petition addressing the 1996 to 2005 period. And that was the period for evaluation.

I think the original petition was '96 to 2011, but the period for evaluation was '96 to 2005.

And, SC&A was tasked in May, the next month, May of 2017, last year, with providing a review. And we did so in a July 27th review which reviewed the addendum and for which we made a presentation at a Work Group meeting in August of 2017, not '18, August of 2017 as well as a Board presentation along with NIOSH in August, about a week later, August of 2018 in Santa Fe.

And, again, a lot of the issues were revolving around the question of presumption of compliance as well as the -- as well as reviews that spoke to program adequacy and completeness.

So, that was much of the discussion last year.

The week of March 2018, this year, based on some feedback we received from commenters at the Board meeting in Santa Fe, NIOSH led a group, including myself and Josie, as I recall, to conduct interviews with Los Alamos County workers as well as some of the other commenters.

And, that was done in Santa Fe back in March of 2018. So, that was a follow up to the Board meeting previous. I think it was August of 2017.

Now, bringing you up to the current discussion, on

September of 2018, a few months ago, NIOSH issued its response to our review of last year from July and that's much of what we're going to go into in terms of the details.

And, we, in turn, a few weeks ago, a couple weeks ago, November 16, issued our response to NIOSH's response of -- in September. And that's much of what we're going to, again, address in today's meeting.

So, that's kind of -- that's a thumbnail of where things stand.

Any -- I guess, Josie, if you have any questions or if the Board -- the Work Group has any questions on that, I think that's pretty much the background.

Member Roessler: Joe, this is Gen, I don't have any questions, but thank you for putting that together. That's so helpful.

Member Lockey: Yes, Joe, Jim Lockey, I don't have any questions either.

Chair Beach: Brad, anything from you?

Member Clawson: No, I'm good.

Chair Beach: Okay, yes, it was very appreciative that you did that. It does help kind of bring it all back together. So, thank you.

No questions, then, NIOSH, if you're ready to go through your White Paper? I guess, LaVon, you're going to take that?

Mr. Rutherford: Yes, this is LaVon Rutherford and I am doing that. I am the SEC health physicist, lead health physicist. I'm lead health physicist for Los Alamos, too.

I got this slide up, can everybody see that now on Skype?

Chair Beach: Yes, I actually don't have Skype up, so I'm just going to follow through with your paper.

Mr. Rutherford: That's fine. I'm just -- okay, so those of you have Skype, can everyone see that?

Chair Beach: Can I ask, LaVon, did you send that out? Your slides?

Mr. Rutherford: Yes.

Chair Beach: Can we send it to my work, my RL email, Ted? I don't think I got it there.

Okay, thanks, LaVon, you can go ahead.

Mr. Katz: LaVon, it's showing in Skype.

NIOSH Response to SC&A review of SEC-0019 LANL Addendum White Paper (Sep. 2018)

Mr. Rutherford: Okay, all right.

So, I'm going to give NIOSH's -- an overview of NIOSH's response to SC&A's review of the LANL addendum.

So, I'm not going to go through the background because Joe did a wonderful job of doing that and I -- just a few minor bullets, he went through much more detail than I did.

So, a summary -- to summarize our conclusions in the addendum, if the site was compliant with the federal regulation 10 CFR 835, then workers should have been appropriately monitored and their records should have been retained.

So, if those two requirements were met, then dose reconstruction would be favorable. NIOSH would review the radiation protection program required for a site and determine when DOE approved the RVP.

We would also review DOE non-compliance tracking system and the Occurrence Reporting system looking

for non-compliance as associated with 10 CFR 835.

SC&A, as Joe mentioned, issued their review and a general summary of their review is program compliance with 10 CFR 835, while necessary under DOE's Price Anderson regulatory framework, was not sufficient for demonstrating that actual radiation program practice was adequate.

Reliance on oversight findings based on non-compliances or incidents is likewise necessary, but not sufficient to validating that LANL or any DOE contractor had implemented 10 CFR 835 in a complete and substantial manner.

SC&A also noted that they indicated that inadequate consideration was given to exposures and missed doses from radionuclides other than those had been well documented, the exotics, especially mixed fission and activation products.

So, based on SC&A's review and the Advisory Board's reaction to that review, NIOSH decided to re-evaluate our approach to the 10 CFR 835 series.

NIOSH concurs with SC&A's assessment that compliance with the 10 CFR 835 milestone may not be sufficient for demonstrating actual implementation of the requirements and reliance on oversight findings may not be sufficient for validating LANL had fully implemented 10 CFR 835.

So, we determined that we would increase the weight of the evidence by doing additional data analysis.

So, our White Paper responsive findings provides you additional analysis to support the weight of the evidence. The White Paper also includes an appendix, Appendix A, which is titled SEC-00109 LANL Petitioner Issues.

That table includes the petitioner issues and NIOSH's response. The forum the issue was brought up in,

whether that be a Work Group meeting, Board meeting, whether it was with the initial petition itself and the supporting documents that were provided in that forum as well.

One of SC&A findings questions LANL's ability to monitor for mixed fission and activation products.

In our paper, we pointed out germanium detectors had been widely used at LANL for in vivo measurements since the mid-1970s.

LANL used germanium detectors extensively for whole body counts and LANSCE workers starting March 1979. This is a primary area where it depicts with mixed fission and activation products and where other exotics would be.

It's true that Phoswich detectors were used as late as 1998 and used in conjunction with germanium detectors and not exclusively relied upon.

Over 7,000 mixed fission and activation products in vivo records primarily for LANSCE workers were best using germanium detectors.

So, use of -- so in the White Paper -- did my thing jump here? Hold on a minute.

Okay, it did, it skipped a slide, I apologize.

So, use of exotic radionuclides, especially mixed fission and activation products were rare, especially for the period under evaluation, the 1996 to 2005.

As pointed out in SC&A's memorandum, LANL noted that internal dosimetry programs were established on an as needed basis and monitoring is only required for radiological workers likely to receive 100 millirem annually from internal exposures.

I want to point out, this is going to come up a few times during my presentation. And this is an 10 CFR 835 requirement. You are not required to monitor

individuals -- personal monitoring for individuals where they are likely to receive, unless they are likely to receive exposures of 100 millirem CEDE.

So, when we went back to look at what additional weight of the evidence can we provide, we thought that if we had reasonable evidence that a good field monitoring program existed, that was in place to routinely monitor for contamination, radiation and airborne radioactivity that would identify radiological areas where workers were likely to exceed 100 millirem CEDE, that would be good evidence that unmonitored workers did not likely exceed 100 millirem CEDE.

So, if we're establishing areas, our thought is, if we're establishing areas for -- based on the airborne levels and that would possibly give a person a 100 millirem CEDE, if we define them well and we control those areas, then unmonitored workers would not receive it.

So, if this is true, if this program existed, then it would make no sense for the -- that it did not exist for mixed fission and activation products or other exotics.

Additionally, we thought that it would be a good idea to compare the primary radionuclide exposure which we have a lot of data, 200 millirem CEDE, just to see how much higher or where they still -- when you compare them to the other.

So, next slide?

So, we started with the field monitoring program. It appears from our review the health physics program had matured over time from the late 1980s when DOE Order 54.8011 came out in the early '90s when the DOE Rad Con Manual came out.

Each of these required routine monitors to identify and control radiological areas and those

requirements ultimately became part of the federal regulation.

It identified over 60 procedures addressing radiological protection covering program administration, exposures, contamination control, monitoring, instrumentation, protective equipment, emergency response and ALARA, As Low As Reasonably Achievable.

Additionally, area specific procedures and instructions existed.

We also reviewed field monitoring data from the period under evaluation. We looked at the radiation work permits, so a monthly and quarterly contamination surveys, area specific contamination surveys, area specific monitoring data quarterly reviews, area sample analysis data, air sampling, monitoring technical evaluations, airborne radioactivity investigation reports.

We wanted to look at how work controls were established and felt from a field monitoring perspective, it would be good to look at the radiation work permits.

So, we've done multiple -- many data captures at LANL over, you know, the number of years. In that time, we found many boxes of LANL work permits.

We didn't capture all of the work permits, but we did capture quite a few of those that were representative sampling.

We also focused on the issue with mixed fission and activation products and other exotics, we focused applying RWPs that involved non-routine radionuclides. Although, we did capture a number that included the time we're in.

From our review, the RWPs we found that most require pre-job and/or post-job contamination

surveys. Most of them specified respiratory protection. Most of them required RCT coverage including stop work or hold points for additional evaluation.

Most of the work areas included CAMs. Many required job specific air monitoring or breathing zone air monitoring and associated monitoring were included. Several required nasal smears.

The RWPs generally did not include bioassay requirements. The RWPs appeared to have been designed to minimize the likelihood of intakes via engineering control, PPE and respiratory protection.

The RWPs were also designed to detect material release via air monitoring and smear surveys. Elevated surface or airborne contamination would trigger an assessment of the need for bioassay.

So, you had this whole package, it's -- you're doing pre-job surveys, you're doing post-job surveys. You're doing surveys while their job is going on. You're looking to identify airborne areas which would -- which could raise to the level of requiring bioassays. You're doing those things.

So, in the White Paper, we provide a couple of examples of occurrence reports where field indicators included CAM alarms, personal contamination surveys and nasal smears led to bioassays.

Now, I want to talk about our comparison of monitored worker dose to the 100 millirem CEDE.

I think it's important to look at the dose of monitored individuals to see how the site was controlling the dose to those individuals.

These were the individuals the site felt were most likely to be exposed and they determined that their field monitoring program -- and they determined that from their field monitoring program and verified it

through bioassay when necessary.

So, as pointed out earlier, LANL noted that its internal dosimetry monitoring programs are established on an as needed basis. Monitoring is only required for radiological workers likely to receive 100 millirem annual for the internal exposures.

They further noted LANL has an in vivo monitoring program established for fission and activation products and has historically used in vivo monitoring for these nuclides -- radionuclides.

A spectral analysis of each count was performed by an in vivo staff during each review, all peaks were identified and accounted for.

NIOSH received the LANL Bioassay Repository Database. The database includes 106,950 in vivo records.

Now, as expected, most of them are associated with plutonium-239 and americium-241, 82 percent. U-234 and thorium-234 made up 10 percent. But, the bulk of the remaining records are the 7,000-plus records are primarily comprised of fission and activation product radionuclide for the LANSCE employees that were required via germanium protectors.

Primary radionuclides, tritium, plutonium and uranium, there were over 450,000 LANL urinalysis dating from 1945 to 2008.

As previously mentioned, we had over 100,000 in vivo records. The data are presented and evaluated in the internal dosimetry coworker data for LANL.

We pulled tables -- the tables in our White Paper, 5-1 through 5.- are pulled from OTIB-0062 which is that coworker data. And they show for the primary radionuclides, dose per workers generally goes down over time. And dose for monitored workers are less

than 100 millirem CEDE with one exception.

So, basically, what they've shown is that, over time, LANL has taken actions to reduce the exposure to the monitored workforce. So, that in itself would make no sense if they wouldn't also be reducing the exposure to the unmonitored workforce.

And, doses for the monitored workforce is already less than, for the most part, less than 100 millirem CEDE required for monitoring.

We also included in the White Paper, as I mentioned, an Appendix A, a table. A number of issues have been identified by the petitioner over the course of several years.

Mr. Evaskovich, who's on the line now, has been very active in this process. In the initial petition, he provided a 102-page written narrative with a CD with a number of documents.

He's provided other documents over the years. And he's, as I mentioned, been very active in Advisory Board meetings, Work Group meetings and others.

So, Appendix A identifies the petitioner issues and provides NIOSH's response to those issues.

As mentioned earlier, it also indicates the forum that the issue was identified in, whether that be a Work Group meeting, Board meeting or in the initial petition.

So, in conclusion, the field monitoring and contamination control programs at LANL were well established and formalized by January 1, 1996 to ensure areas where workers were likely to exceed 100 millirem CEDE were well identified and controlled.

Based on review of existing bioassay results, workers monitored for the primary radionuclides were unlikely to have received intakes exceeding 100 millirem

CEDE.

So, based on our evaluation of the routine monitoring program and the comparison of the monitored worker dose to the 100 millirem CEDE, NIOSH found -- has found no evidence to suggest that unmonitored workers were likely to have received 100 millirem intakes for the common radionuclides or the exotics.

And, that's the end of my presentation.

Chair Beach: All right. Thanks, LaVon. A couple things jumped out at me when I was reading your White Paper.

Mr. Rutherford: Okay.

Chair Beach: Back in August 23rd to be exact, we had a full Board meeting with presentations from both you and SC&A.

One of the big things that came up was the 1999 LANL Self-Assessment. And in that, NIOSH had agreed to go and look at that and report back to the Work Group. What happened to that planned follow-up?

It was important to know whether those findings were real issues, bioassay data, completeness in 1990s. And do you have any plans to resolve this concern over the --

Mr. Rutherford: Yeah.

Chair Beach: -- adequacy and completeness?

And then there's another one, too. In that same transcript when I was reviewing it, we had, you had mentioned the PAAs of, that were completed in October of 2000. And there was a plan. Apparently, there was some data from the Denver Federal Records. And you were working on retrieving that information.

And you were also going to report back to the Work Group with an update on that. So those two things just to start with.

Mr. Rutherford: Okay. Well, I will agree that we did not do a really good job of coming out with a response to NC ID, the non-compliant 484 for in this White Paper. And that is one action that we need to complete.

I will say, though, that, you know, my general review of the response -- we did get the, roughly 150 pages of, back from, between Los Alamos and the other record center that we went to.

And my general review of that, it did not drive a broad revamp of the bioassay program. What was driven was additional administrative controls and to ensure that individuals could be identified that were on bioassay programs, whether it be for a plutonium, americium, or whatever.

And it also provided a management tool for them to go back and look at which individuals were on it. And it helped them to ensure that management could get those people to do their proper bioassay. And that was done.

Initially, they were going to do that with bioassay cards. Ultimately, they moved to a more electronic approach for doing that.

And again, I agree. We did not respond to that well. And we will provide a formal response to that. And I see no problem with getting that formal response together before the April Board meeting.

Chair Beach: Well, the April or --

(Simultaneous speaking.)

Mr. Rutherford: Excuse me?

Chair Beach: The December or April?

Mr. Rutherford: Well, I don't know that we can --

Chair Beach: Oh.

Mr. Rutherford: Actually, after reviewing -- and I'm not going to jump into Joe's presentation. He actually identified a couple of things that I'm not sure we had looked at. And so I think when we do our proposal as well we could --

Chair Beach: Okay.

Mr. Rutherford: -- when it comes to assessments.

But the issue of the, you know, the assessment that was completed, we will provide a actual formal response to that.

Again, I do not believe that the corrective actions that were taken -- I want to point out that the corrective actions that were taken none of, at no time did they change how they would identify individuals that required bioassay.

They still used a work package. The internal dosimetrist would identify if bioassay was required based on a threshold quantity. And then the routine monitoring program, the field monitoring program would verify this when the activities occurred.

That did not change after the 1999 assessment. Also, the methods of doing personal monitoring did not change. They did not change from the 1999 assessment how they monitored for mixed fission and activation products. And they did not change how they would monitor for other exotic radionuclides.

But again, I will -- I did, I agree that I did not provide a good response to that in this White Paper. And that will be done.

Chair Beach: Okay. So, my last question, then I'll let someone else take us, some questions if they have any.

Slide number 10, and it kind of follows up on what we were just talking about. NIOSH is emphasizing that LANL's field monitoring programs are well established and formalized by January 1, 1996. So it seems like that's the, what you're falling back to.

Does NIOSH also consider whether these programs are actually carried out according to the requirements and procedures to also be relevant to the question of program performance?

So you've got the procedures. You've got --

(Simultaneous speaking.)

Mr. Rutherford: Yeah, Josie, I can respond to that question. Yeah, that's, the idea of looking at the field monitoring data was to see if they were actually doing some of these things they committed to in their program procedures.

So I'm looking at the air sampling data, looking at the RWPs, looking at the quarterly contamination surveys. All these different things we were looking.

That's where you're implementing those things in the field, or at the field level. You're implementing the field monitoring program. So, yes, we did look at those things.

Chair Beach: Okay. But it just keeps bringing me back to those 1999 results. But I'll let someone else -- does anybody else have any questions for NIOSH?

Member Roessler: Josie?

Chair Beach: Yes.

Member Roessler: This is Gen. I have a question.

Chair Beach: Okay. Go for it, Gen.

Member Roessler: Okay. My slides don't have numbers for some reason. But I think it's slide

number 7. I counted in. And the title on the slide is NIOSH response to SC&A issues continued. If you could find that, that's where I have the question.

Mr. Rutherford: Okay. I'll see if I can put it up on the Skype. Okay.

Member Roessler: And it's the first bullet that says technical capabilities, et cetera.

Mr. Rutherford: Yes.

Member Roessler: And then under that, you say use of exotic radionuclides at LANL were rare especially up into the 1990s.

Well, it seems what we want to know is what was the use from '96 on. This kind of implies that they might not have been there in the period that we're interested in.

Mr. Rutherford: Well, I apologize. That actually was noted after I had already completed the presentation.

The actual, the use of exotic radionuclides was rare from '96 till the end of the -- or was rare for the entire period we evaluated. You could basically look back and you'll actually see some of that pointed out in Joe's presentation.

You can see how for LANSCE. The exposure potential dropped off increasingly over the years, especially when they approached 1995, '96.

Member Roessler: Okay. Okay. That helps on that.

But then just a little bit of follow up on the exotic radionuclides, the slide before that, you're talking about the germanium detectors being used. And somewhere in here you talked about the fact that they could identify all the peaks.

And I think what you're trying to say is by these measurements that if there were any radionuclides of

interest present except, of course, the beta emitters, but that they could see it.

Mr. Rutherford: That's correct.

Member Roessler: Okay.

Mr. Rutherford: They -- somebody started to say something?

Chair Beach: Yeah, this is Josie. I was going to say something, but I'll let you finish on that topic.

Mr. Rutherford: You know, and I will, you know, I'll just say that's correct.

Member Roessler: So, if they were monitored, then they should have been able to see any of the exotic radionuclides.

Mr. Rutherford: Yes, with the germanium detectors.

Member Roessler: With the -- yeah, okay. Good. That's all for me.

Chair Beach: Yeah, and this is Josie, again. Isn't it true on that same topic if they were asked to look for them, if they were, they could do it, but they weren't always asked to look at that? Is that correct?

Mr. Rutherford: So I would say that that's true. I think that was, I think that's what Joe points out in his --

Chair Beach: Yeah, okay.

Mr. Rutherford: And I will -- but I'll also respond to the fact that, you know, if you have a LANSCE employee and you have air sampling data that supports that we need to do a bioassay on that employee, that obviously the internal dosimetrist is obviously going to look at mixed fission and activation products, the nuclides of concern for that area that that individual is working at.

Chair Beach: Okay. Thank you, LaVon. Any other questions for --

Member Clawson: I did. Josie, this is Brad.

LaVon, I want to tell you something. I've got a problem right now. I know we've been through this numerous, numerous times.

But you're expecting us to be able to say that we are going to say that they will monitor because of the implementation of CFR 835 and stuff. You do realize that even in today's world we're still having trouble with companies not complying to that. But you're wanting us to be able to say, yeah, they were complying by this, so everything is wonderful.

I just want to be right up front. I really have a heartache with that, because even in today's world, we're still getting violations. We're having problems with interpretations still of this CFR.

So, for us, and also a few I -- to tell you the truth, I have not seen much of a change from what we discussed in the first go-around with this. You're still coming back to, well, 10 CFR 835 in our eyes LANL is doing it, so we're good with it. But I still really haven't seen -- it's the ones that we don't see.

And I just want to be up front of where I'm at on that. So I just, I've got a heartache with this, because you're wanting us to take a program, say, well, this was implemented. And we're still arguing over that program in today's world and still fighting with companies to comply with it because it comes down to some of their interpretations.

And if you look out there, we're still getting violations to it. So, for you to be able to tell us that this is, we can, it's not an SEC, but then all of a sudden, they're right there, I have a heartache with it.

And it's nothing against your work or whatever.

There's just a lot of void there. And I am not going to take it on blind faith that this was all implemented. And it's because of my background that I say that.

Mr. Rutherford: Can I respond to that?

Member Clawson: Sure.

Mr. Rutherford: Well, I understand your concern. And that's the reason why we went back and we actually did the additional work. I know you, you know, you don't think we did additional work.

But the idea is if they are implementing their field monitoring program -- and the way you're going to evaluate whether they're implementing their field monitoring program is to look at that field monitoring data and go down it and see if they're doing that.

So, if they're implementing a field monitoring program -- and clearly they were for the primary radionuclides because we verified that through the bioassay that we looked at.

You know, if they're implementing it through for the primary radionuclides, why would they not be implementing it for the mixed fission and activation products in the exotics? It's the same program and the same people in charge of the same program.

So, you know, I understand your concern. And, you know, we will do whatever is necessary to, you know, to resolve it. But I'll just leave it at that.

Chair Beach: LaVon, it goes back to they weren't doing it prior to '96. So why can we believe they were doing it after '96? I don't know if we've got the proof that shows --

Mr. Rutherford: Okay. Well, I'll respond to that, too, as well.

Chair Beach: Okay.

Mr. Rutherford: Okay. I admitted that their methods for monitoring in the '70s and that's why, you know, for mixed fission and activation products were not appropriate. That's why they changed in the late '70s and into the '80s and all the way up to the '90s to a degree.

But the requirements for routine monitoring that I can talk about, the field monitoring, they evolved over time. They weren't necessarily there in the '70s and the early '80s.

DOE Order 5480.11 came out with some of those hard requirements. Then the DOE RadCon Manual came out and followed that up with a little more detail. And all of these went into 835.

So programs progressed over time. And it's pretty clear that they did when you look at how doses dropped over time.

Again, I will do whatever is necessary but, to, but --

Mr. Stempfley: LaVon?

Mr. Rutherford: Yes.

Mr. Stempfley: This is Dan. We are in the process -- we didn't really verify compliance with 835. We're actually, as part of the SEC, we're evaluating the ability to reconstruct those with sufficient accuracy. So we kind of focused in on certain areas.

Mr. Rutherford: That's --

(Simultaneous speaking.)

Mr. Stempfley: -- did not identify anything that indicated that we, as the SEC group, could not bound those with sufficient accuracy, not complete compliance with 835, but just the dose reconstruction part that we're looking at, right?

Mr. Rutherford: That's correct. We looked at whether

the areas, the parts of 835 that we needed to, whether -- and those are the parts that were they identifying areas where the individuals were likely to exceed 100 millirem CEDE. We looked at that through the field monitoring program. And then are those records retained? And do we have those records? Yes.

Member Lockey: LaVon? Jim Lockey.

Mr. Rutherford: Yeah, Jim.

Member Lockey: I had one question to ask you. I don't know what slide it was anymore. I can't -- I didn't write it down.

But when you were talking about the doses for monitored workers, you said there was one worker that exceeded the 100 millirems. Is that right?

Mr. Rutherford: No, that's incorrect. What I said was when you compared the 100 millirem or when you compared the monitored workers -- I'm going to pull that slide up real quick for you here. I know it's -- yeah. I was wondering if that would be misinterpreted.

Either way, what I was saying was we took the primary radionuclides and we took those primary radionuclides and that was all documented in our coworker model. And we looked at the numbers for the monitored workers. And this is the whole group of monitored workers.

And we had proposed an approach using two percent of the SALI for, which basically approached the 100 millirem CEDE. We had proposed that approach for unmonitored workers. We would use that dose and those intakes and for unmonitored workers.

And so what we were doing was comparing that 100 millirem CEDE to what the actual doses were to the monitored workers. And in one case, which is actually

I think Super-S uranium, the actual monitored workers' doses were higher than what we had proposed for the unmonitored workers.

And, but, you know, again that's for uranium, an isotope that we had not found any infeasibilities for. And it was a factor of ten I believe.

And again, that was for monitored workers. Does that answer your question? It wasn't a specific individual.

I would point out that we have found no indication where LANL has ever been, LANL has ever identified individuals that were not monitored and ultimately were monitored and exceeded 100 millirem CEDE.

Yeah, I hope that answers your question.

Member Lockey: I think it does, yeah. Thank you.

Chair Beach: Okay. Any more questions for NIOSH at this time? Joe, are you ready for your presentation?

Mr. Fitzgerald: Yes.

Chair Beach: Okay. Thank you.

SC&A Review of SEC-00109 LANL Addendum White Paper (November 2018)

Mr. Fitzgerald: Again, Joe Fitzgerald. I also don't have the on-screen capabilities. So I'm just going to go through this.

And I apologize. I also notice there's no numbering on this either. So we'll, I'll have to use the titles to peg this.

Anyway, we did, in fact, review the September White Paper and provided our reflections. The first slide, I just wanted to -- and we did reach out. So I'm not going to go into detail.

But the, in terms of the SEC-109 Evaluation Report Addendum, we didn't go into the Addendum. The end

date of December 31, '95 for that Class is, was based on the presumption that LANL would have been in full compliance with 10 CFR Part 835, Occupational Radiation Protection, by that date.

And with full compliance, again, NIOSH would assume that all DOE work sites, including Los Alamos, would have satisfied the monitoring requirements contained in the rules, thereby resolving any limitations, which is important because, again, the limitations were the exotics as far as monitoring prior to the end of '95.

So the presumption of January 1st was that with the promulgation of the rule the presumption is that Los Alamos, across the board, would, in fact, have implemented the 100 millirem CEDE in terms of a monitoring criteria for anybody, including unmonitored workers.

So, in any case, that would certainly remedy the challenge of demonstrating a, you know, a monitoring program and sufficient records for dose reconstruction in a coworker model for the various exotic radionuclides.

In any case, NIOSH in response to some of the comments that we made, and I think LaVon mentioned this, has concurred that, yeah, one can't necessarily presume on January 1st that the, that a decision on, that 100 millirem CEDE could be based on sort of the legalistic or compliance basis for things turning around on January 1st, that one would need to look at more objective evidence of the implementation of the bioassay program in response to 835.

And that was the, I think the basis for providing the additional information, the additional evidence that LaVon has gone through to indicate what Los Alamos did and whether or not that would be a sufficient basis for, again, sticking with the 100 CEDE on that particular date.

Now, one comment I would make before leaving this slide, I think LaVon mentioned that, you know, and we agree that the mixed activation products and mixed fission products, perhaps exotics in general, were rare, were in rare usage and exposure potential compared with plutonium, uranium, and tritium, the primaries at Los Alamos.

I think that's been pretty much a given throughout the operating history, including the last SEC period.

But I would also just want to make sure it's clear, though, that in the Evaluation Report I think NIOSH acknowledges, as do we, that in terms of potential occupational exposure, the mixed activation and mixed fission products were deemed as of sufficient interest and significance, along with the primaries, that you would want to address whether or not, in fact, you could dose reconstruct and whether or not, in fact, you could have coworker models that would address any unmonitored workers.

So, in one breath, we say that, yeah, they're relatively rare when you compare it with the production of, or the usage of plutonium and uranium. That was pretty clear at the lab.

On the other hand, they're not insignificant nor negligible in the context of dose reconstruction. They need to be addressed, need to considered, and in fact, were the basis for the SEC Class, as I indicated earlier, that was defined up through '95.

So, you know, they do have that significance. I didn't want to get that lost.

The next slide, I just want to summarize where I think -- and LaVon went through this, so I'll be quick on this.

NIOSH did concur, based on our review of last year, that 10 CFR Part 835, the presumptive compliance aspect wasn't sufficient, that one needed to show

more in the way of evidence that 100 millirem per year CEDE, in fact, applied and applied to exotics, applied to unmonitored workers exposed to exotics, as well as in the primaries.

And I think from that standpoint, as LaVon has gone through, he finds that the other bases that NIOSH is advancing beyond what was said last year, which was the presumptive compliance, include the field monitoring programs.

And in terms of the number of in-scope requirements, procedures, documents, I think he's gone through all that. So I won't repeat it, but certainly the scope and extent of those documents exemplifying, as he was pointing out, a program that appeared to be pretty comprehensive and would have, in fact, provided the monitoring across the primaries and would, as he just indicated, presumably include the exotics as well.

And beyond that, I think the question of sort of testing the 100 CEDE criterion from the standpoint of looking at the bioassay data, fundamentally the primaries, and looking at whether or not the fact the program could be seen as controlling intakes such that the 100 CEDE would, in fact, be seen as effectively implemented.

And finally, as we pointed out in our paper, I think NIOSH concludes, or makes a judgment anyway, that one should view the implementation of Part 835 as a paradigm shift in the way DOE operated. And that would apply to Los Alamos.

And whereas, you would perhaps see some shortfalls in how the bioassay program may have been implemented, in this context it would have been exotics, those shortfalls would not be evident with the implementation of 835, so again, going from a presumption of compliance to what I would call an assumption of implementation, again, around the 100 CEDE.

And again, with all that, I think NIOSH is making a conclusion surrounding a weight-of-evidence argument that if you take all of the above, that one can conclude that the 100 millirem CEDE can be applied to intakes, which equates to a two percent of the SALI, and that would be justified for unmonitored workers for 1996 to 2005, and that would remedy the basis for the preceding SEC Class going forward. So I think that was the conclusion that we read.

Okay. Again, let me just sort of go into, and this is covered in more detail in our paper, but the -- we wanted to, you know, respond to what we thought were the two central arguments that LaVon and the paper present.

And the first one we tackled was this question of program adequacy. And we define program adequacy with the emphasis not only on the definition, the scope, the formality, you know, whatnot, but also whether or not one could demonstrate that the program was being implemented effectively.

So, from our standpoint, when one is looking at program adequacy, it's both the definition and documentation, but, you know, as importantly, maybe more importantly, whether or not the contractor and the personnel were carrying out those procedures and making it happen on the ground so that there would be some confidence that, you know, these controls, this monitoring, field monitoring, contamination control, whatever it is, was, in fact, happening and being effectively implemented.

So that's kind of what we focused on. And that's where we had I think our biggest concern. And we reviewed all the documentation, looked at the scope. And it's impressive, but, you know, not surprisingly so.

We're talking about a premier laboratory with a 50, 60-year history with some of the top health physicists in the country, a mature program that, you know, as

LaVon pointed out, had evolved and had refined its documentation. And it had a, certainly an impressive scope of documentation that was very current and very much in keeping with accepted practice and requirements and whatnot.

So we certainly don't question the, you know, the scope of that program, the formality of that program, the fact that it's established.

What we're focused on is the, sort of the other issue of whether, in fact, given all those, that documentation, those requirements, procedures, expectations, whether, in fact, they were being adequately carried out on the ground and being implemented by the facility.

And going back, this self-assessment is probably becoming somewhat famous. But the reason we wanted to highlight that is, one, it was a self-assessment. This is something Los Alamos lead.

They went through the, I thought rather extraordinary initiative to bring in outside experts, people, other dosimetrists who actually had very current experience with similar concerns at other sites. And in this case they brought in MJW from Mound and health physicists from Savannah River.

And they wanted to focus on the implementation of the bioassay program, in particular whether, in fact, the enrollments, the checklist, the special and, you know, RWP-driven, job-specific bioassays were being identified and collected and whether, in fact, they were complete, again, quite apart from the extent of the procedures.

And this doesn't say the procedures, the process, or the requirements were flawed. It really speaks to whether or not they were being implemented effectively, whether, in fact, the management was holding the staff accountable to making sure that, you know, people were being identified and that, in

fact, bioassays were coming in.

And I think we get into this later. But DOE had frankly identified the fact that at a number of sites that, you know, probably likewise had very comprehensive bioassay procedures and requirements, the execution of those procedures were coming up short. And workers were not being identified or weren't providing bioassays.

And that was of fundamental concern to the department. And I'll get into that later.

But that would be certainly a reason to look at the 1999 self-assessment, not from the standpoint of, you know, to what extent did they change the requirements. I mean, it's not necessarily the problem with the requirements.

The question is execution or implementation. Did they, in fact, follow their procedures adequately? And what's the implication?

And this gets to, I think one of our biggest concerns is what's the implication. You have a finding of incomplete enrollments by the CTW contractor. You have incomplete bioassay submissions in response to RW-required, job-specific bioassays.

Okay. That's a sampling. And that was a sampling done I think in probably less than a week of review.

What are the implications to the completeness, adequacy and completeness of your bioassay records for that time period? And I would say the time period is the late '90s, because the corrective actions took place in 2000.

You know, what's the implications? Was this sort of a situation where they did find that bioassays weren't necessarily submitted, but it turns out in terms of the follow-up that, you know, it was a small percentage or the percentage they found didn't reflect the body

of bioassays collected was at just one facility? In terms of the CTW, in terms of an enrollment, was this a isolated situation or was it reflective of a broader problem?

You know, at other sites in the context of evaluations, when situations were identified where clearly you had incompleteness in terms of, or evidence of the incompleteness in terms of the bioassay program, the notion was to not only look at the outcomes in terms of procedures revised, but to look at the implications for the completeness, adequacy and completeness of your records, bioassay records.

That's the key in our view that, yes, this is a sampling. But what are the implications for the completeness of those records?

If it's five percent missing, is that a significant issue? If it's 20 percent missing, and whether it's enrollments or bioassays, that, you know, to me would be certainly something very significant that would have to be addressed in the dose reconstruction program.

So, anyway, that's sort of the backdrop on this question of the 1999 self-assessment from our standpoint.

And it stands as probably the only -- and I can be corrected. But we didn't, we haven't found any other what I would call validation review, one that actually goes to the ground level and looks at implementation in that way during that time period up through 2000.

That stands as a pretty significant review and one that speaks to this question that we're after, which is quite apart from the all the requirements and procedures and, you know, expertise and technology. Did they, in fact, execute and collect bioassays in enrolled workers as they should in terms of the CTWs?

And in that slide, we also pointed out that, again, you know, NIOSH I think had pointed out that the 1990 review or oversight in general weren't really a sufficient basis for looking at adequacy. But we would point out that it's a necessary thing. We did say necessary not sufficient.

And again, the oversight that matters I think goes beyond the paper and looks at the execution. And that's kind of where we were going with this whole question of necessary but not sufficient.

Oversight review is necessary but unless one actually gets beyond the requirements and procedures and looks at implementation, it's not sufficient. So that's, from our standpoint, it's the implementation that ought to be the focus at Los Alamos as well.

Next slide, and this gets to the question of whether the intakes can be bounded by 100 millirem CEDE. And we identified as sort of a data completeness, adequacy and completeness question in the White Paper, not to mention the Addendum, NIOSH is looking at the primary LANL radionuclides, okay, the tritium, the plutonium, uranium. This was the mainstream operational source terms at Los Alamos. And they're pretty much up front.

And we've gone through a number of questionnaires and interviews with the dosimetry staff that that was the focus of the program, that the primaries, in fact, were the focus of the program. And that's where the bioassay data are abundant.

And it's pretty clear that from NIOSH's review, and we don't, you know, certainly dispute that, that based on the amount of the data and the analysis in terms of what the intake values appear to be, that they appear to be boundable by 100 millirem CEDE. So we don't have any issue with the question of the primaries.

But we do have a question with the statement that

based on that and based on sort of a general review of the program, the formality of the program and what Los Alamos has indicated, that NIOSH would find no reason to believe, and this is again no reason to believe that intakes of exotic radionuclides by unmonitored workers would be substantially different. Okay.

And what we are trying to focus on is the basis, the objective evidence that backs up the belief that's stated here.

You know, when you say you believe something like this, given the context of a SEC having been based on the lack of, you know, bioassay data for exotics and an applicable DR method, you know, the statement that there's now in '96 versus '95 no reason to believe that intakes would be different, then I think the first thing that we're trying to focus on is what is the basis for that, what has changed in terms of whatever evidence is being presented that wasn't available in the prior years that makes a difference.

And if it's not compliance with 835 on January 1st but the implementation of the bioassay program in that same time period, then I think it sort of raises the question, well, what has changed in that program that would make that much of a difference from one year to the next that one could have a confidence level that the, that one could bound those intakes.

And I think the first issue we have is that we could not find any substantiation for NIOSH's belief. I mean, I certainly understand the discussion on the formality of the program and the fact that, you know, certainly on paper NIOSH, I mean, LANL has a very comprehensive field monitoring program. We're not disputing that the procedures, requirements, RWPs are very comprehensive.

We're not disputing that for the primary radionuclides, plutonium, tritium, and uranium, that

there is, in fact, an abundance of data and that, in fact, that when one goes through that data from a coworker standpoint that there's, you know, certainly a lot of information that would provide bounding intakes for the primaries.

But we have not been able to discern from any of that any new data, any new analysis or a method that would demonstrate that one could dose reconstruct the exotics or certainly bound the intakes of the exotics in a way which wasn't available in the preceding time period.

And going back over -- and this is going back a long ways. And admittedly, we're talking probably seven or eight years ago. But looking at the transcripts, as I'm sure some of you have done as well, we spent a great deal of time talking about the question of how one could remedy the lack of data, bioassay data, for the exotics.

And we turned and certainly NIOSH turned to the primary radionuclides and I thought, you know, did a yeoman's effort to find methods such as, you know, the substitute nuclide approach using primaries to bound intakes of exotics because of presumed similar handling of those exotics to the primaries and other assumptions that would allow you to do that.

But over the course of a year or two, I think the conclusion that was reached by both the Board, the Work Group, and NIOSH, and I'm sure NIOSH will want to jump in at some point, was that, no, as hard as one could try, and I think a great deal of effort went into it, there were some fundamental reasons why trying to compare or use the primary data to bound or to indicate that the intakes of exotics were similar just came up short because they weren't handled necessarily the same in all cases.

And, you know, the type of operations involved were, in fact, in many cases different. You're talking lab-type operations, experimental operations versus

more production-oriented operations. So you're talking about maybe more intermittent exposure pathways versus more chronic pathways.

And it's laid out in our report. So I won't go through that. But it just seems that we've already gone through much of the discussion about how that doesn't work.

The third bullet I want to dwell on a little bit is -- and I think LaVon mentions this, and certainly we have acknowledged this as well.

But, you know, Los Alamos, in response to a number of inquiries as well as interviews, you know, indicates that, you know, the reason we don't see, you know, a lot of bioassay data for the exotics is that the workers were not required to be monitored for them, that, you know, they were scarce, that there was a judgment that they weren't significant. So they weren't, they just weren't monitored for them.

And that is a, as you can see, that's a fundamental challenge because, again, as one can look in the ER, there were actually some fairly substantial exposure pathways associated with the exotics. In fact, mixed fission and mixed activation products were flagged, along with plutonium, tritium, and uranium, as source terms of note in the ER. So I think there's definitely a conflict with that.

And one thing I want to point out is that, and give NIOSH a lot of credit for this, that certainly in the 2012, 2013 timeframe I know they went through a lot of effort to try to pin down Los Alamos from the standpoint of providing what's called objective evidence, in other words, yes, after January 1st of '86 you were obliged to implement a program that would provide a 100 CEDE basis for monitoring.

And I think NIOSH went through, went to the extent of providing a detailed questionnaire for the lab to respond to just trying to ascertain how was that

implemented and is there any concrete evidence that you can show us that it was, in fact, directed out and that it was accomplished and what the timeframe might have been.

And in short, and this is documentation that's available in the SRDB, LANL declined to provide any objective evidence, which was the specific request of NIOSH, to back up its statements.

You know, and these are the statements that we've been reading that, in fact, there was monitoring on an as-needed basis, that 100 millirem was, in fact, a criterion and if, you know, if there's no data, it's because the workers didn't meet that criterion, that there wasn't any significant exposure, and that Los Alamos, in fact, has always had in vivo programs for mixed activation products and mixed fission products and has used them. The fact that there's no data or little data is beside the point that the capability was always there.

And I just want to just mention that the questions that NIOSH posed to the lab in 2013 and requested any objective evidence in return included how Los Alamos ensured compliance with 835.402 for exotics, when current procedures and practices for exotics were put in place, whether such procedures and practices to ensure compliance with 835 for exotics were in place by January 1, 1996, whether the implementation of these procedures and practices were manifest in LANL's monitoring records after January 1, 1996, and if not, when they were, in fact, put in place, and were they, in fact, in place now.

In the response that came back from the lab, you know, basically the lab lumped all the, you know, this was repeated for each of the exotic nuclides, lumped them all together and said, you know, listen, we, you know, have procedures in place and, you know, we have the capability, and if they're not monitored, the source is not significant to, in fact, be monitored.

So it's actually declined to provide the objective evidence. And that's kind of getting down to what concerns us in a lot of respects, that we're at this stage now, you know, seven or eight years later debating some of the same issues, that, in fact, yes, Los Alamos makes these claims and, yes, there is, in fact, you know, procedures and requirements that one can look at. And the primaries, certainly there's an abundant database for the primaries.

But essentially, there's just no, as far as I can tell, no new objective evidence from either the lab or from the analysis themselves in terms of exotics to give us a basis for knowing that, in fact, 100 CEDE per year is something that has been implemented and is, applies for the exotic nuclides, which, in fact, were the basis for the preceding SEC.

Okay. So, anyway, and this is something I'll get back to a little later. But, look, you know, if one takes the dates off of this, and we're not talking, you know, post-'95 but say an earlier timeframe, and we have a source term or series of source terms actually in terms of the exotics -- and this is nothing new. We certainly deal with exotics in most of the laboratories.

If we lack bioassay data, if we lack sufficient air sampling data, and the source term information is not usable for coworker model development, you know, the only recourse in our respects is to come up with some modeling of some sort to either demonstrate some negligible exposure or find some way to bound it. And that's been sort of the recourse I think in the past. And that's the precedent.

And in this particular case, and I'll talk about this a little later, it just seems like we're recycling or going back to some programmatic, you know, arguments and primary nuclide arguments that we've already covered and we covered almost eight, nine years ago.

So I'd like to think that, you know, for this final time

period, there's some other avenue to, you know, basically provide the, quote, objective evidence that, in fact, things have changed and that there's a capability to bound these doses or not. And that's kind of where I see the 100 millirem per year CEDE issue.

Next one, and these will go faster I think, I promise, the 10 CFR Part 835 as a paradigm shift, this is something we talked about last year.

And, you know, we agree very clearly with NIOSH's point that when 10 CFR 835 was promulgated, that raised the stakes. You know, an enforcement program will do that. It raised the stakes, got people's attention. And I think accountability did increase or it did improve. But it did not necessarily happen on January 1st of that '96 time period.

You're talking about deeply embedded programs, ways of doing things, processes, people, not just paper but people, who have done perhaps bioassay collections and have done checklists, have done their, you know, their enrollments the same way for years. And, you know, the expectation that that culture, that, you know, those habits would change overnight, even with a Price-Anderson enforcement program, I don't think is necessarily true.

And this was borne out and very clearly borne out by a recognition by DOE itself certainly a year or two later that, you know, as they were making the rounds, they were seeing very much the same kinds of shortfalls in bioassay program implementation at a number of sites. And, you know, these were mentioned in the report.

But, you know, starting with Mound, going through Savannah River, and three other sites, as well as those two sites, when you get up to five or six sites, I think the notion was, okay, we have a generic issue. And it was a determination by [identifying

information redacted] at the time, who headed DOE enforcement, that, you know, it wasn't doing any good to deal with this piecemeal.

But apparently, there was a common, as they say, a common issue. And rather than take additional or further enforcement actions, because they were citing various sites notice of violations, they felt it would be more productive to have a moratorium, 120 days grace period where no more enforcement actions.

But all of the DOE sites, every DOE contractor would need to go back and conduct its own self-assessment along the, you know, given the list of, I think they had something like 30, 35 deficiencies that were identified earlier, and using that as a starting point, self-assess its own program, provide those results back to DOE.

And as long as that was done and reported when DOE actually -- at the end of the 120 days, when DOE would, in fact, start strictly looking at bioassay programs, if they, in fact, took the corrective actions, then that would get them off the hook for any further enforcement action.

So I guess our conclusion is that 835 was a paradigm shift but one that took time. It was certainly through the '90s that, late '90s that you got accountability to the provisions in 835, particularly for bioassay programs.

I had looked for other instances where DOE took that kind of an action, a moratorium, which was a pretty significant initiative. I didn't find one.

So I think the fact that they singled out bioassay programs in DOE for an action like this sort of signifies that there was a generic difficulty in bringing the DOE sites into conformance with 835. And that took some time to happen.

Anyway, next issue, and technological limitations, I'm not going to go through all these. I think, you know, NIOSH raised some exceptions to some of the issues that we identified.

I will admit that we weren't very clear on the distinctions with the germanium detectors. And we acknowledge that certainly the germanium detectors were in place. That's something we noted in our review, our last review, and that part of the confusion was the introduction of the three-detector array in '98 and the way we cited that.

So I think there was some, you know, probably wording that could have been improved on that. And we certainly admit that there's some issues that could be clarified. But there's no disagreement at all on that question.

The points that were raised in that particular section, you can read them for yourself. The only one that we disagree with frankly is there was a mention that there was a dose reconstruction approach for exotics that was, and referred back to the ER Addendum that was, that it would apply to exotics.

And looking at the citation in the Addendum, it basically goes to the label implementation of 835. So it's a little bit circular in the sense that the method is, in fact, the implementation of 835 on January 1st.

So, and we have a, obviously, have an issue with that in general. So we don't think there's a dose reconstruction method per se at this point once you take presumption off the table. So that's what we're kind of wrestling with.

Next issue, this one deals with the oversight finding in 2001. I'm not going to go through that either because I think we explain it pretty much in detail in the report.

But again, this is a question that Los Alamos had the

capability, no question, for MAPs and thorium. However, as DOE pointed out, in terms of how they managed that process between LANSCE and the dosimetry office, implementation would have been hampered. And that's pretty much the bottom line there.

I don't want to make too much of it. But certainly there is a discrepancy in how that was handled.

Neptunium, this goes hand in hand with the general issue of the presumption if one has an issue with 100 millirem CEDE based on to what extent the reg was implemented, then I think one would have an issue with whether or not these other neptunium, potential neptunium exposure sources ought to be reviewed.

And we covered this last year. And I think that's also pretty well clear, too.

Another specific issue was DOELAP accreditation. I'm not going to spend a lot of time on that either.

All we would say is that based on experience at this site and other sites that DOELAP did have a role in advancing I think 835 implementation for the internal dose program, internal dosimetry programs.

And in fact, I think it was '98 there was a coupling between 835 and a requirement for DOELAP accreditation to be achieved. I think I got that right.

And for Los Alamos, in particular, as early as '97 the lab and DOE agreed that they would advance accreditation as a, one of the corrective actions for weaknesses found in the plutonium bioassay program. That was a non-compliance issue under Price-Anderson.

So I think from that standpoint I wouldn't have, I would certainly say that DOELAP was relevant. This is not speaking to the dosimetry. Obviously, it's speaking to the functionality of the program. But

nonetheless, there's a relevance in terms of advancing the tenets of something like 835.

Okay. Sort of going to the creative part of this presentation, you know, looking at this thing and realizing that we were treading very much the same ground we treaded seven or eight years ago, I got a little frustrated in the sense that, you know, what's not, what's really not happening, what's not happening is if one can't come up with the objective evidence that your programmatic implementation of 100 millirem CEDE is expansive enough to include the exotic, the monitoring of the exotics as well as the primaries, then how could one look at the exotics from perhaps a different vantage point to see whether or not since the threshold of 100 millirem CEDE, and the question is, you know, we're talking about exotics. These are sporadically used. And we don't disagree that they contain perhaps a rarer commodity as time went on.

Could one look at exotics in the post-'95 standpoint to, you know, find ways to demonstrate that, in fact, you're talking about exposures that would be uniformly under 100 millirem for the operations and the workers that existed, that continued to exist past '95?

And I went ahead and chose LANSCE. I mean, it's just one sliver of certainly the operations that historically handled exotics, in this case, gaseous mixed activation products. But it was one that was fairly easy to focus on and present as an illustrative example. And that's all this is. It's just an illustrative example of circumstances that certainly changed in my view dramatically once you got into the 1990s and beyond.

And I think the graphs that we presented and the tables we presented, I mean, the information came from Los Alamos environmental documents, as well as NIOSH's ER. But essentially it just shows that what

was at one point and described in ER as, you know, a dominant source of airborne radionuclides at Los Alamos, such that you were measuring doses at the fence line, by, certainly by the 1990s almost became a negligible exposure source.

And looking at it from the standpoint of, and using immersion dose as a marker, it's not, you know, obviously internal. But using it as a marker, the whole body dose calculated also declined dramatically. And you can look at the table from that standpoint as well.

Whereas, as late as 1990, you could look at 120 millirem whole body as a calculation. That went down to virtually negligible by '98, '99, what have you, certainly well below 100 millirem.

I guess I wanted to put that out there. And again, this is average worker, not max worker, but put that out there as saying, whereas before '96, I think the data and the, you know, whether it's air sampling or source term or whatever was not manageable in terms of a bounding dose per se, looking at these exotics from the standpoint of usage and whether, in fact, they were available for exposure and if so in what context, I think, and I don't know, but I think there might be a pathway to demonstrate, provide what I would consider more objective evidence that these would all fall under 100 CEDE rather than in my view conjecturing based on LANL statements that aren't backed up by objective information or relying on the paperwork, the requirements that may or may not have been implemented effectively.

It just seems to me that once out of this dilemma and it is to establish whether or not the conditions at the site from the source term standpoint perhaps had changed enough by the mid to late '90s that, you know, that would be possible.

And also the marker of 100 CEDE, because that is the threshold that I think, again, has been advanced

because of 835, is a more manageable marker than what we typically had to deal with, which is if it's not negligible then one has to find a dose reconstruction method that would characterize.

In this case, I think what one is characterizing is whether or not one can show that you can come below 100 CEDE, which it may or not depending on the typical nuclide, may or may not be manageable.

But I wanted to throw it out there as a postscript, because I think otherwise we're sort of in this impasse, which I don't see an easy way out per se.

So, in any case, that's for the benefit of the Work Group and one that takes, sort of takes off from this question of these exotic exposures becoming increasingly sporadic, as NIOSH claims and as we agree, in the '95 to 2000 timeframe.

Conclusions, basically three, that first, that we still do not see a substantiation that, in fact, for the exotics that 100 millirem per year of CEDE would bound exotic intakes. We don't see the new information, the new analysis that supports that.

I think what NIOSH is providing in its White Paper speaks to the fact that this is the case for the primaries, that some of the analysis they did was pretty good and the information provided is pretty thorough for the primaries. So I think, you know, clearly one can make that conclusion for the primaries. But I don't see how, you know, whether there's any new evidence for exotics that would apply.

The second one is this question of the '99. And, you know, again, it was a question mark why there was no treatment of that. And I think LaVon has discussed that. But, you know, the question of the implications, you know, I want to go back to that.

It's the implications of adequacy and completeness

which is the key. Yes, they sampled. And they found, you know, bioassays weren't submitted. And they found enrollments were incomplete.

Does that speak to a broader lab-wide issue? Or for whatever reason, was that isolated and not reflective of the overall bioassay program?

That implication is the key one because that speaks to whether or not you have a adequacy and completeness issue that would hamper dose reconstruction with sufficient accuracy. And I think that's where we always come down to when we find that evidence.

And I know for other sites that we're going through the exercise of trying to demonstrate that. And I think that's where we're at for that particular finding.

And again, finally, the DOE enforcement moratorium in '98 in our view underscores the commonality, you know, the, you know, more generic problem of deficiencies in bioassay program implementation, since we're talking implementation across the DOE sites. And this is three years after 835 was promulgated.

And on that basis, you know, I know we have switched from a presumption of compliance to what I would call an assumption of implementation. But I don't think one can assume implementation of 100 millirem CEDE based on the kind of fundamental problems that I think DOE picked up on in terms of how these programs are being implemented, including Los Alamos.

And it doesn't appear that, you know, the corrective actions necessary to bring these around were completed until probably in the 2000 timeframe based on, you know, DOE requiring that they be, in fact, put in place and providing evidence that, in fact, they were effective. So I think that's the takeaway from that.

Any questions?

Member Lockey: Joe? Joe, Jim Lockey. Can you hear me?

Chair Beach: Yeah, go ahead, Jim.

Member Lockey: So I wanted to look at Slide 14 again so I really understand what you're -- what were you, in one sentence, what were you trying to say in this slide?

Mr. Fitzgerald: I'm sorry. What --

Member Lockey: Slide 14.

Mr. Fitzgerald: What's the header on that?

Member Lockey: Yeah.

Mr. Fitzgerald: What's the --

Member Lockey: Slide 14, that's the average occupational external doses from LANSCE that you put up. Sorry, Joe.

Mr. Fitzgerald: Oh.

Member Lockey: In relationship to how the Board can take this slide to get us moving forward, what --

Mr. Fitzgerald: Yeah, what I wanted to show there, again, was just taking one sample, one example, in this case the gaseous mixed activation products that were being emitted by LANSCE.

Member Lockey: All right.

Mr. Fitzgerald: And, you know, NIOSH makes the statement that, you know, these became more sporadic and they were relatively rare. And I wanted to say, yeah, you know, we're not trying to suggest that things didn't change, that the further you go time-wise the exotics seemingly had been handled less and less.

And I wanted to take one example, in this case the MAPs from LANSCE, and instead of dealing with it qualitatively and saying, yeah, we think, you know, subjectively they became rarer and rarer and, you know, the exposure potential became less, I wanted to test that thesis.

And so I took the LANSCE emissions for 1990 through 2002. And based on the release values and the maximum exposed individual -- and this first one is environmental, so don't -- you know, again this is the estimated dose to the maximum exposed off-site individual. And this is at the fence line.

And I think it's pretty dramatic. I think, you know, in the time period of the previous SEC, you know, we had some fairly substantial -- I mean, even as late as 1990, you're talking about, you know, a fair amount of emissions in terms of 120,000 curies and a measurable dose at the fence line, so, but if you look at the trend, by the time you get to '95 and '96, a dramatic decline, almost negligible by '99, but certainly well below what was taking place in the years previous to that.

On the next slide, we do turn to occupational. And this comes strictly from the NIOSH Occupational Environmental TBD. It's right in there as a table.

And this deals with using argon-41 as the marker, but includes immersion dose as well as whatever internal dose to come up with a whole body calculation. You know, so correspondingly, the occupational dose as measured likewise goes down considerably from 1990 down to '96 and well below 100.

And, you know, I didn't want to spend a lot of time doing what would obviously be NIOSH's research. But I wanted to, for the sake of discussion and for the Work Group, just suggest that, you know, this notion that things had changed at the lab is something I think ought to be addressed and ought to be given

some focus, because certainly the source term data and air sampling information may not have been adequate before '96.

However, if, in fact, the source term effectively went away or certainly could be shown to be less than 100 millirem max, then, you know, one could demonstrate certainly much more objectively than we have that 100 millirem CEDE would be a reasoned threshold to apply.

Otherwise, I don't think even with all the Los Alamos statements, you know, there just isn't any new, objective information, analysis, data. That hasn't changed.

And please correct me. We've looked and I don't see anything new as far as bioassay data. I don't see anything new as far as actual bounding analyses. And I don't see anything from Los Alamos that would be a basis, objective basis for their claim.

So I just think the Work Group is in a tough spot. And I think the only way you could have a, you know, sort of a objective basis to agree that, you know, there's no more presumption of compliance that would be the basis for 100 millirem, but perhaps there's a way to show that the source terms have diminished and could be shown for the worker to be, you know, consistently below 100 millirem for the exotics of concern.

And for this case, I just looked at G/MAPs from LANSCE. But it certainly appears to be the case for, you know, again, that one source term.

Member Lockey: All right, Joe. It's very helpful. Thank you.

Chair Beach: Yeah, thanks, Joe. Any other questions for --

Member Roessler: Josie, this is Gen.

Chair Beach: Hi, Gen. Go ahead.

Member Roessler: Yes, that was a very long presentation. And Joe brought up a lot of concerns, a lot of things to think of.

But it seems to me that what he is saying is that, and in fact he said there is an out for NIOSH and that they need to establish that the condition, and I think when he said condition he means that the implementations of this program, that it had changed by the '90s, by the late '90s.

And, Josie, you also brought up the question what was changed in '96. It seems to me that's really the whole focus perhaps.

And I'm wondering now NIOSH has listened to the presentation and certainly they must have anticipated this as they read his report. I think at this point the Work Group needs to hear from NIOSH as to how they'd approach Joe's concerns.

Chair Beach: And I certainly agree with that, Gen. I was just going to let the Board Members ask any questions and then punt it back to NIOSH. So, with that, Brad, do you have any questions from SC&A's presentation?

Member Clawson: No, I think it was just saying the same thing I was saying, just a little bit more professional. So, no, not at this time. Thanks.

Chair Beach: All right. And for me the key slide was -- and I don't know what number it is again. But it goes back to the NIOSH or 1996 when everything changed.

Yes, 835 wasn't implemented in late '95. But you also have to look at the programs, the deficiencies. I mean, there was widespread deficiencies across the complex. That was in '97 and '98. You have to look at the 1999 report. That's really all we have as a basis

to look at as to how that was actually working.

So I'm going to leave it at that for right now but, and let NIOSH answer those questions that were brought up by both Lockey and Gen, if you're ready for that, LaVon.

Mr. Rutherford: Well, you know, I'll just -- you know, I'm going to let Jim, Dr. Neton, define what we will consider going forward. I think he's maybe, has a little more even keeled on this in going forward and can give a better response on what we can do.

I would say that the statement that we never provided a sample dose reconstruction was incorrect. We did provide it. That sample dose reconstruction method was based on the 100 millirem CEDE. But what it did was it was, it included all isotypes. It didn't matter whether it was primary radionuclides or exotics.

And maybe I misunderstood what Joe was saying on that. But we did provide a sample dose reconstruction. And I don't think SC&A has provided anything that supports that that dose reconstruction is not valid.

But again, I'll let Jim comment on where he sees this path going.

Dr. Neton: Thanks --

(Laughter.)

Mr. Rutherford: Well, that was a good one. Well, I did that because I felt like you were probably, you were going to be a little more objective and have ideas that we can, you know --

Dr. Neton: Well, just a couple comments I wrote down while Joe was talking. And it was a pretty comprehensive discussion.

You know, regarding that, the original audit that

occurred would identify some non-compliance of the bioassay program, I don't recall them ever saying that there should have been a mixed activation product bioassay while focused on the routine of bioassay samples that were being taken.

So, in that sense, you know, no one ever criticized the fact that they weren't having a routine bioassay sample for mixed activation products. I'll have to go back and look at that a little closer. But that just crossed my mind.

The other observation I would make is that it seems like there was general agreement, although I'm not sure 100 percent on this, that we can do the routine, we can do dose reconstructions for the routinely monitored nuclides.

We have coworker models that go all the way through 2008 for these nuclides. And we could use those coworker models if need be. We were trying to make it a little simpler than that.

If that is true, then we're left with the exotics. And Joe raised some good points that we probably haven't done a good enough job demonstrating why we believe the source term is so different from the earlier Class that was added and how the monitoring program changed to allow us to say we can do dose reconstruction now.

I know there was some preliminary data that we've looked at recently that did just that. It demonstrated at least for one year that the, they took a lot of mixed activation product samples in facilities like LANSCE. And my recollection is virtually all the samples were non-detectable.

Mr. Rutherford: Yeah, and I will comment on that. And that is correct.

And I will also comment on the -- I didn't know about which way you were going with that, Jim. But I was

going to comment that, yes, the data that we had looked at so far there was very little activity.

And it's very clear from the LANSCE reports, the 1994 report where their concern was emissions from stacks, because they controlled at the source with glove boxes and closed systems such that exposure to the occupational workforce in the area was minimal.

Dr. Neton: And so I think there's some work that we could do to shore up that end of it. I do recall the source term for the earlier Class was fission products to a large extent. And I think that at one point they were analyzing pieces and parts or whatever that were taken during the weapons testing at the test site. I don't know if that existed in this 1996-plus period.

So I think we do need to go back. And if we could just agree that we can do routinely monitored nuclides and we can show the source term changed significantly in the 1996 forward period and show that either for the source term and/or the monitoring data that we have, then maybe we can come to some sort of an agreement.

But, you know, there's work to do on our part. And I think that NIOSH will go back and relook at the mixed fission, mixed activation product source term.

Chair Beach: Jim, this is Josie. What kind of a timeframe are you thinking here?

Dr. Neton: Well, that's a good question. I can commit to anything because in April I'm retired.

Chair Beach: Exactly.

Mr. Rutherford: Josie, I'd like to comment on that. The timeframe totally depends on how much we've got to dig down into and how much data we got to

dig down in to find to give you an answer that you can make a decision on. So it could go three months. It could go three years.

Dr. Neton: Yeah, that's a good point. I mean, I think trying to come up with --

Mr. Rutherford: Understanding what it's going to take to get an answer, that's a pretty critical point.

Dr. Neton: Well, one thing that we've done at other sites, and Savannah River comes to mind, is that we could put forward a strategy, a sampling plan or an analysis plan, and provide that to the Work Group and see if they would -- before we go on, embark on this endeavor, we could see if everybody agrees that this would be, if we could do, you know, actuate this sampling plan, that it would be sufficient to prove our point.

Chair Beach: Yeah, I'm just a little frustrated that a year ago, over a year ago we asked for the 1990 in MAPs. It got noisy in here all of a sudden.

Anyway, I'm just a little frustrated about the NIOSH didn't give us back anything that we asked for last year on that, the 1999 assessment that was done at LANL. So it's, that's a bit frustrating.

Member Lockey: Jim Lockey. When can you give us an analysis plan?

Dr. Neton: That would be up to Bomber I suppose. But we'd have to go back and look at the source term data and what we have as far as air samples, how difficult -- this would more than likely require the data capture effort, correct, Bob and LaVon?

Mr. Rutherford: Yeah, I need to -- well, we need to look at what data we have, the source terms, as Jim mentioned, decide, you know, what additional data we may need. And then we can come up with a schedule.

Member Clawson: Well, I'd also like to mention, realize that we've been on this coworker model at Savannah River for numerous years now. And you know my frustration on that part of it.

Yes, this last time we sat down and went into great details and stuff. But this is about the third or fourth different sampling plan that we've gone through, too, you know. So, you know --

Dr. Neton: I think, Brad, this is a little different. I mean, we're talking here about demonstrating that the potential to receive 100 millirem CEDE was not there for this particular source term. And --

Member Clawson: Well, I meant --

Dr. Neton: -- if the 1999 data is any indication where they're all non-detected, you could have some pretty significant airborne activity for mixed activation products and be below 100 millirems. It shouldn't be as difficult as the Savannah River --

Member Clawson: Coworkers.

Dr. Neton: Those are coworkers. We're really parsing the data there quite a bit and the broad overview of what the exposure potential is during this time period of the source term.

Mr. Rutherford: And, Josie, I will say, we will get you the response on the assessment. That will be, that can be done, as I mentioned, before the next Board meeting. And it may be sooner. I don't know. But that's not going to be our long haul, I don't think. I think it's the, this answering the mixed fission and activation products.

Chair Beach: Okay.

Mr. Fitzgerald: Yeah, this is Joe. I just have a comment. Of course, the reason I included the LANSCE analysis was to prompt this kind of discussion. And I think this is good.

But, you know, I think the gateway question into this, you know, the -- I read the basis for the SEC for, you know, through '95. And it was the lack of available monitoring data, as well as available process and source term information, that would be a basis for, you know, bounding these doses.

And I agree with Jim that 100 millirem is more forgiving. But I think the gateway question is whether, you know, that condition, the availability of source term data and sampling information, monitoring data across the, you know, the exotics that we're talking about, you know, would be different, would be more available or, you know, could be assessed differently such that you get where you're going to get.

It's almost like a feasibility question before launching the data capture. And I don't know the answer to that.

The reason I threw out that one notion was that if you step back, it certainly looks like the source terms, at least in this one case, have come down considerably. And that very well may be the case for the others.

But then the question becomes from a method standpoint is there enough grist for, you know, to actually come up with the analysis given the fact that I don't think there's more bioassay data, but certainly there might be enough characterization information from the operations that could give you that lead.

So that, I think maybe that would be an initial question followed by, you know, capturing that information. But, you know, maybe a yes or no to whether or not that exists for the, you know, the exotics in question would be a good question to answer.

Mr. Rutherford: Well, I'd like to say that if, you know -- and I understand where Joe is going. But we can

also look at air sampling data if air sampling data proves my point that they were controlling the source and they were controlling individuals -- then the 100 millirem is correct whether, I mean -- so it's not only the source term. It's not only the fact that the source term is diminishing.

If we could show that by air sampling that the air sampling was there and they were doing, they were monitoring for mixed fission and activation products, then our analysis was correct.

Dr. Neton: The problem we're going to run into, and maybe I'll throw this on the table right now, is that these are likely to be general area air samples. But based on our first analysis that I heard about, they were extremely low, like less than MDA.

So, if one can allow for the fact that general area samples are not necessarily representative of the workers breathing zone, but you can allow for some amount of difference, like a factor of ten or something, and incorporate that in there and still show that these are below 100 millirem, that may be sufficient.

I just want to be clear that, you know, I know we've had issues before with using general area air sample data. But that's likely what we're going to have.

Chair Beach: Okay. Thanks.

Mr. Fitzgerald: Yeah, so, yeah, I think, you know, that is headed in the right direction. And that coupled with a dispositioning of the 1999 issue -- and there to me it's strictly a data completeness question, a records completeness. You know, what are the implications for -- and this is the same thing as Savannah River. What is the implications for knowing that the bioassay program is sufficiently complete in terms of those records?

And, Jim, you said earlier that you didn't hear any

mention of mixed fission products or activation products on that particular review or audit. And I agree.

I mean, but to me it's not so much that question. I think this speaks to the completeness question in general as to whether or not, you know, whether or not the bioassay program was, in fact, complete enough to rely on the records for dose reconstruction.

And it may very well turn out that the way the sampling was done, these were isolated, not consequential to that question. But I think that would be in the follow up that you're planning. It's not just simply whether procedures were changed, but what are the implications for the completeness of the bioassay records based on what one would see from that. And I don't have an easy path forward as how one does that.

But, you know, I'm a little concerned that that was a, you know, it was a internal audit. It was a sampling exercise done in one week. So, you know, I don't want to put too much, you know, significance to it other than the fact that it's a signal that there's an issue. And the question is how big is the issue.

Dr. Neton: Yeah, and I'm not sure about this one. If I recall, it wasn't like they were missing gross segments of the population, just certain people that were on the RWP weren't sampled and didn't get the word.

And we have a lot of bioassay data for the routinely encountered radionuclides. Like I say, we have full coworker models already from 2008 for the routine nuclides.

And my recollection is that their 50th percentile is below the MDA. And I think in some cases, their 95th percentile may be below the MDA.

So, in that case, if you're missing a few workers out of the thousands that were monitored, I think you would have to come up with some scenario that the most highly exposed workers were missed in this sampling shortfall. So --

Mr. Fitzgerald: Yeah, what I would be interested is exactly what he just said. Is it a few workers or is the implication that it's more than a few workers? And it's hard to tell based on the little information we have on that audit right now.

Dr. Neton: See, that's why I got a little confused, Joe, because I think during your presentation, at one point you sort of indicated that you thought, well, maybe for the routine 100 millirem is okay. But then on the other hand, you're saying, well, there would be findings, and for the routine ones, they missed some people. So you still got to go back and validate --

Mr. Fitzgerald: No, I think the issue for the audit is strictly the completeness of the bioassay records in terms of whether the CTW contractor enrolled, you know, a appreciable number of the workers that they were supposed to enroll and whether, in fact, on job-specific bioassays they were, in fact, complete.

I mean, this is reminiscent and it's not surprising, because this was a generic issue that DOE directed self-assessments across the board. But that would be a question of whether it has any implications for the completeness question taken broadly.

Dr. Neton: Yeah, okay. Well, I think that's an easier issue to address than the mixed activation products.

Mr. Fitzgerald: Yeah, yeah. And I want to make that distinction, because I think that's kind of the, I don't want to call it typical, but an issue we see at many sites. You come up against some evidence of incompleteness in the data. And then the obvious question is that incompleteness reflective of

something that would be consequential for, you know, dose reconstruction or not.

And I think then, you know, there's definitely some avenues of inquiry that will tell you is this reflective or is it, you know, clearly not going to be significant enough to affect, you know, as you were saying, affect the coworker models.

Dr. Neton: Right, and again, I was trying to also bring up a point that that audit was really about a finding against Los Alamos missing people who should have been monitored, you know, or the people that identified that should have been monitored and they were missing people.

But again, I saw no evidence I don't recall that said they're missing major source terms of people that weren't monitored like mixed fission products, mixed activation products, that sort of thing.

And I don't know if that audit actually addressed that issue when they did a more broad scope review or whether they just looked at what they were monitoring and determined that they were, you know, were monitoring the people they thought they should have been monitoring properly, not are we monitoring the people in general.

Mr. Fitzgerald: Yeah, I don't think we know enough on that review, which is, of course, the reason to follow up on it. But those would be, I guess, questions that need to be answered.

And I just want to make sure, though, that the overall thought that, you know, the implications for dose reconstructability is clearly the outcome. And I think, you know, it sounds like, you know, you would be looking at it from that standpoint.

It's not a question of mixed activation products versus the primaries. It's just really a standard question of completeness.

Dr. Neton: Yeah.

Chair Beach: Okay. Thank you. Any other questions before we sort of talk about -- well, one thing I want to throw out there, too, is why -- I guess I want to ask the Work Group Members why shouldn't the Work Group advance a recommendation for an SEC extension through 2000.

I know we talked about an analysis plan. I know we've been working on this for the last ten years or so. This analysis plan will take some time. Again, once we decide if we want to go forward with the analysis plan, that's going to take some time. And Jim indicated a year, three years. It's really we don't know at this point with more data capture.

So I guess I'm throwing out, based on all of that, why not extend the SEC through 2000. And I'm just looking for Work Group Members' thoughts.

Member Clawson: Josie, let me -- and the basis for that is because of the findings that we found in that one document that we really didn't get a report back on of the shortcomings.

Chair Beach: Right.

Member Clawson: I see no problem with it. I think, I'll be the first one to say I move that we ask for SEC up through 2000.

Member Roessler: Josie, this is Gen. I'm not quite, I'm not ready to go with that yet. It seems to me that some of the things that Jim and LaVon mentioned that they would look at, and I think they need some time to consider what was brought up today. I think they have one more step before we go that route. And that would be to get a response from NIOSH after today's discussions.

Chair Beach: Okay. And I bring it up only because a lot of this stuff we talked about today is stuff we've

been talking about for a while. So thanks, Gen and Brad, and then Jim.

Mr. Fitzgerald: Josie, if I might make a comment.

Chair Beach: Okay.

Mr. Fitzgerald: If you're going to think about adding a class to cover the 1999 assessments, that is based on the routinely monitored radionuclides not being adequately monitored. It has nothing to do with this mixed activation product discussion that we've been having.

Chair Beach: I understand.

Mr. Fitzgerald: And we've already agreed prior, in the Class before that, we can do dose reconstructions for workers for the routinely monitored nuclides. So there would be a major disconnect in the logic of going down that path based on the 1999 assessment --

Chair Beach: Yeah, I guess I was going -- yeah, thank you. I was going back to the program adequacy due to that -- well, the cutoff date, '95 may have been a few years premature based on the ability to reconstruct dose for those mixed fission products. And that is a benchmark of what the program looked like.

I mean, I understand what you're saying about pinpointing the primaries versus the exotics. So thanks for that clarification.

And then, Jim, did you have any comments?

Member Lockey: Yeah, my comment is I think I'd like to give NIOSH a chance at the next Board meeting to lay out what it would take and what timeline it would take to look at the source terms over that period of time. If it's going to be a two-year process, that's too long. If it's going to be a short process, I'm willing to wait for a short process.

Chair Beach: Okay. I appreciate that. Thank you. So I'm going to go back to NIOSH. And can your.

Katz: Let me just address -- this is Ted.

Katz: Let me just address what Jim just said because I think there's something else that's important here.

I mean, Jim said if it's going to be a two-year process, that's no good. But honestly, I mean, that is not a basis for having an SEC as to how long the research follow up would be. That won't swing it.

If the Board believes that the path forward will not be productive, that's sort of a different matter. But for the path forward, because it might take longer than the Board would like, you have that issue with a number of sites. We've had that issue, you know, multiple times over these past 15 years.

And it's just, there's no getting around it. But that's not a decision criterion for adding your class. I just want to make that clear. But --

Member Lockey: Thanks, Ted. I appreciate that comment. I just, you know, we all get frustrated how long it takes.

So I think if NIOSH can come up with a reasonable timeline that we agree that, the Board or the Working Group agrees that would most likely answer the question one way or the other, that would be the best approach. Yeah, thanks, Ted.

Path forward/WG recommendations/December ABRWH meeting plans

Chair Beach: Okay. So, LaVon, can you summarize moving forward a plan of action?

Mr. Rutherford: Yeah, I can --

Chair Beach: And then --

Mr. Rutherford: I think the two key -- okay, yeah --

Chair Beach: Do you mind if I just jump in? And I don't want the petitioners to think we have forgotten them. We have not. So I just want to wrap this up, and then we'll get to petitioners' comments. Thanks.

Mr. Rutherford: Okay. I think we've committed to two things. One is the responding to the assessment, 1999 assessment, giving our response and how that assessment and what came out of that assessment potentially affects dose reconstruction. And that one I think can be done prior to or by the April Board meeting.

The other one is the, actually coming up with a plan for determining the source term, coming up with a plan that lays out how we're going to determine whether the 100 millirem CEDE is a good number for mixed fission and activation products.

And I think I heard somebody say that they'd like to have some kind of a schedule by the -- are we talking by this Board meeting +

Mr. Katz: That's no time. That's truly right around the corner.

Mr. Rutherford: I was hoping that I could get, have, you know, some time. And, I mean, it may not take me till the April Board meeting to come up with this, lay this out and everything. But having it by this Board meeting is going to be very tough.

Chair Beach: No. LaVon, can you have it maybe sent around to the Work Group before April so we have a chance to comment on it and maybe have it more shored up by April, the same time you send, the 1999 assessment comes out? Would that be reasonable?

Mr. Rutherford: Yes, I think that's

Mr. Katz: Yeah, this is Ted. I just, I think this should be a very high priority. And it would be great to, I

believe to have a draft out to the Work Group to look at and SC&A, not -- I mean, April is a lot away, I think, you know, even earlier in March at least so that they can weigh in and consider it and since this, you know, very important I think for the Board to move on when it can.

Chair Beach: And potentially do you think we could have a meeting before the April Board meeting or would we have to wait till after? What's your sense on that, LaVon? Or do you need to get back to me?

Mr. Rutherford: Yeah, I mean, I really need to get back to you. But I don't know. The initial thoughts are I think we could have one if we got you a draft sometime in March and we were able to have a Work Group meeting to discuss it prior to the April Board meeting.

Chair Beach: Okay.

Mr. Rutherford: And my initial thoughts are we could. You know, if we start laying it out and everybody starts screaming at me, I'll let you know.

Chair Beach: Okay. Okay.

Member Lockey: LaVon, just before we leave the subject on scope, though, I know you mentioned mixed activation and mixed fission. Given the scope preceding SEC included also these other nuclides, was that your intent just to focus on part of that or did you intend to include curium and, you know, some of those other exotics?

Mr. Rutherford: I think we'll look at all the exotics and, you know, that we can, that there's a source term of concern in this period. And so --

Member Lockey: I'm just saying the jump-off point was that the nuclides that were the basis I think prior to '96 and whether that would be carried forward in your review.

Mr. Rutherford: Yeah, I think we could comment on it all.

Member Lockey: Okay.

Chair Beach: Okay. Any other comments on the plan forward? And being that the Work Group is divided on this, I think we need to move forward with NIOSH providing this to the Work Group and giving them the time to do that.

Any other comments? Okay. I'm going to go to the petitioners' comments. But before I do that, again, LaVon, you did mention you created a table at the back of your White Paper. But you did a very good job in looking at all petitioners' concerns. And there were a lot of them.

Joe actually had comments on one of them. Joe, is that something that you'd like to discuss now or just -- there was no time to get it out to the Work Group, so just something to verbally discuss and then get it out after it goes through the normal process.

Mr. Fitzgerald: Yeah, I mean, I think a lot of the questions we would have relate back to the discussion we just had with respect to the implementation of 835, because a lot of the answers in the right-hand column dealt with that.

So there was one, beyond that there was one issue. And this goes to Issue 55. This was one that was a little different than the others in terms of 835 implementation.

And in that Appendix A response for 55, NIOSH stated that given the, quote, short half-lives of the numerous bioassay results for beryllium-7, carbon-11, nitrogen-13, and several other activation products, these spallation products were, quote, unlikely to have been significant contributors to worker doses.

And I guess the only question I had was there was another activation products, such as argon and oxygen, and these are all referenced in the ORAU TBD but are not in Table 4.1 of the White Paper. And they were used, argon and oxygen actually were used as the basis for the estimated whole body and skin doses that were in that table I used.

So I guess just a clarifying question really, and, you know, while we agree that these doses were not substantial, the table seems to suggest that there were doses that were in the 11 to 120 millirem. And for at least argon, half-life is two hours. So, as far as occupational dose, that one would certainly be perhaps a controlling one as far as inhalation or immersion.

And again, based on Table 4-1 of the White Paper, it still remains unclear whether NIOSH has any bioassay or air monitoring data since this wasn't included, oxygen-15 and argon-41, such that you can do mixed activation products.

And, you know, the fact that there is beryllium in the carbon, nitrogen isotypes, as I recall, there was still a problem with ratios and being able to do a dose estimation based on mixed activation products even though there were some separate analyses of those nuclides.

So this is more of a clarifying question, trying to reconcile what's, you know, in the Appendix table for that particular item with what was in the ER and what's been discussed in past Work Groups.

It just seemed like, you know, the focus was on those specific nuclides and the ability to monitor and the fact that there were, in fact, a lot of in vivo data for them, which is true. But whether that enables, you know, a dose estimation for MAPs, mixed activation products, the whole schmear, I think there was some real difficulties coming up with a way to do that.

So that was kind of one comment. And that relates to Item 55. The rest of them I think really tie into the discussion we had today.

Chair Beach: Thanks, Joe. And have you sent that through the DOE process yet or is it in the process?

Mr. Fitzgerald: No, like I said, I didn't want to hold up the main report and the other items. But this one thing I can certainly make sure it gets to the Work Group and NIOSH in the next few days. I'll just go ahead and process it.

Mr. Rutherford: Yeah, after we get the specific response from you, we can, we'll take a look at that.

Mr. Fitzgerald: Yeah, that's the essence of it, though. It's a clarifying question.

Petitioner's comments, concerns and questions

Chair Beach: Okay. Thank you. Anything else from Board Members, NIOSH or SC&A?

Member Roessler: Nothing here.

Chair Beach: Okay. Hearing none, Andrew, you've been very patient. And have you got some comments or questions, concerns?

Mr. Evaskovich: Yeah, this is Andrew Evaskovich. I do. I'm on speaker. Is that okay? Does it sound okay?

Chair Beach: Yes, it does. You're clear for me.

Mr. Evaskovich: Okay. All right. So I've raised issues about the inventory. And there have been at least three separate reviews indicating problems with the inventory.

And, basically, the inventories were identified as source terms, which would be to the air monitoring and the sampling. So, if your inventories aren't correct, then you don't know where to go sample in

order to, you know, start looking.

One of the major ones was the Clean Air Act lawsuit in dealing with stacks. And there were issues with LANSCE concerning the stacks and the emissions there.

So, going into the routine monitoring from that, and there have been problems indicated with that. As far as the comments, one example is the SM-66 americium incident. They sent uranium pellets from TA-55 to SM-66, and they were contaminated with americium.

Now, contamination was not detected prior to leaving TA-55. And there were problems with receiving the samples. But additionally, the monitoring there did not detect the americium, the hand monitoring. Now, that would indicate that there are problems with the routine monitoring as far as, you know, going into, establishing whether or not somebody needs a bioassay.

And the only reason that this contamination was discovered is because an RCT saw some radioactive labelings in a regular trash can. And the only reason he saw that is because the trash wasn't emptied because the custodian was on vacation that week and nobody covered that area.

So, basically, it was just dumb luck that it was discovered. It may have been discovered at some point later on. But still, it took I think seven or ten days before it was discovered.

Now, as far as the exotics go, the neptunium, there was a finding that the air monitoring was not adequate in order to determine if there should be bioassay. So, you know, with the exotics, I think they didn't calibrate I believe the air monitoring or the neptunium. It was a separate calibration from either americium or plutonium.

So I think those problems need to be looked at, because you need to establish where the exotics were. And you need to determine if there was your basic air monitoring and sampling to determine whether or not bioassay should have been done.

As to the three-year question as far as, you know, working on this, I would think that indicates data is lacking. And that's basically what causes an SEC or a cohort to be added is the data is lacking. You can't do an accurate dose reconstruction.

So I think, you know, three years is too long. And I think if it does, you know, extend for, or if it goes for an extended period, that does indicate that a cohort needs to be added for the later years.

There were other things I'd like to address, but I'm going to do that in writing. I'm still working up on that. And I'll submit that I believe before the next Board meeting. I'll send that in to NIOSH to be distributed.

And I think that's all the comments that I have for today.

Chair Beach: Okay. Thank you, Andrew. We do appreciate your comments. And we'll look forward to your comments in writing.

Mr. Evaskovich: Thank you.

Chair Beach: Any

Mr. Katz: For the good of the order.

Chair Beach: For the good of the order, yes. Okay. I think we have a path forward. I think we'll look for something from NIOSH.

And if there's any scoping that needs to go back and forth between SC&A, I'm assuming you can do that via

Mr. Katz: Yeah, absolutely.

Adjourn

Chair Beach: Okay. Okay. Well then, I would say that we can complete our call for today. With no o

Mr. Katz: Yeah, thank you, everybody, for all the hard work that went in to the deliberations today. I really appreciate that.

(Whereupon, the above-entitled matter went off the record at 12:55 p.m.)