U.S. Department of Health and Human Services
Centers for Disease Control
National Institute for Occupational
Safety and Health Advisory Board on Radiation and
Worker Health
Argonne National Laboratory-West/Idaho National
Laboratory Work Group
Thursday, July 16, 2020

The Work Group convened telephonically at 11:00 a.m. Eastern Time, Philip Schofield, Chair, presiding.

Present:

Phillip Schofield, Chair
Henry A. Anderson, Member
Josie Beach, Member
Genevieve S. Roessler, Member

Also Present:

Rashaun Roberts, Designated Federal Official
Nancy Adams, NIOSH Contractor
Bob Barton, SC&A
Ron Buchanan, SC&A
Bob Burns, ORAU Team
Grady Calhoun, DCAS
John Cardarelli, ORAU Team
Mitch Findley, ORAU Team
Rose Gogliotti, SC&A
John Hamawi, ORAU Team
Joe Fitzgerald, SC&A
Jenny Naylor, HHS OGC
Mark Lewis, ATL
Lavon Rutherford, DCAS
Steve Ostrow, SC&A
Tim Taulbee, DCAS

Contents

Proceedings

(11:00 a.m.)

Welcome and Introductions/Introductions

Dr. Roberts: Good morning, everybody. Sorry to interrupt the conversation about smart cars and such, but this teleconference is for the Idaho National Laboratory, Argonne National Laboratory-West Work Group.

I'm Rashaun Roberts, and for those who may not yet know, I became the Designated Federal Officer, or DFO, for this Advisory Board on Radiation and Worker Health a little more than a month ago. This is my first Work Group meeting as DFO. It's excellent to be here with you and I want to officially welcome all of you to the teleconference.

I am hearing a little bit of interference in the background, so if people could mute, that would be great. If you don't have a mute button, press *6 and that should mute you.

Before we dive into the presentations today for this meeting, let's go ahead with roll call and address conflict of interest. And I will go ahead and speak to conflict of interest with regard to the Members of the Board who sit on the Work Group. And my understanding is that in order for them to serve on this Working Group they cannot have conflicts of interest.

So with that let me move into the roll call for Members of the Board who are on the Working Group starting with our Chair and then in alphabetical order.

(Roll call.)

Dr. Roberts: Thank you very much, and again welcome to you all. And before we officially move into the meeting I just wanted to cover a couple of brief items in order to keep things running as smoothly as possible and so that everyone speaking can be clearly

understood.

So as I mentioned before I would ask that each of you to please mute your phone unless of course you need to speak. If you don't have a mute button, press *6 to mute. If you need to take yourself off mute, press *6 again.

The agenda and the complete set of presentations and papers that are relevant to today's meeting can be found on the NIOSH DCAS website. All of these materials were sent to the Board Members and to staff prior to this meeting.

SEC-00219: Burial Ground (1952-1970)

Dr. Roberts: So with that let's go ahead and get started with the presentations. And I'm going to turn the meeting over to the Chair of this Working Group, Phil Schofield.

So, Phil, did you want to clarify the order of presentation under Number 1 on the agenda or would you like me to do that?

Chair Schofield: Sorry. I was on mute. Yes, if you want to go ahead and clarify that.

NIOSH Responses to SC&A Comments

Dr. Roberts: Okay. So we really want the Work Group and others to be able to follow things more easily. So what we're going to do is tweak the order of the first of the presentations listed under Number 1 on the agenda slightly so that things are done in chronological order and have a better flow than what's suggested on the agenda.

So in my short time as DFO I've learned that things can be really challenging to follow because different reports and reviews and responses to reviews are generated at different times. So while NIOSH's presentation under Number 1 on the agenda covers one time period of review and report, SC&A's presentation covers multiple time periods of reports

and reviews. So SC&A is actually going to present in two parts.

So instead of having NIOSH go first, we're going to have SC&A provide part one of its presentation first. NIOSH's presentation will follow, and then SC&A will do part two of its presentation. And I'd like to ask that NIOSH and SC&A provide an explanation or overview of exactly what they're covering as they open their respective presentations so that everybody's clear and can follow along.

So with that I'm going to go ahead and turn the floor over to Joe Fitzgerald and/or Bob Barton to give part one of the SC&A presentation.

SC&A Review of NIOSH Response to SC&A-TR-2017-007, Draft Review of NIOSH's Evaluation Report for Petition SEC-090219, Idaho National Laboratory; Burial Ground, 1952-1970 by Joe Fitzgerald

Mr. Fitzgerald: Yes, this is Joe Fitzgerald. Thank you, Rashaun.

Just as an overview the management or programmatic issues that were raised in our 2017 report were largely carried over to the May 2020 report in response to NIOSH's January response, so just to keep it straight. We have maintained our position relative to those issues from 2017 to the present report.

So I'm just going to essentially reiterate our -- since we haven't had this discussion since 2017, our points raised in both that report as well as our more recent response.

There's going to be a slight overlap because there were additional programmatic considerations raised by NIOSH in its January report that added to that ER review, so just to avoid confusion we'll treat the programmatic issues first. And Bob Barton is going to address a proposed bounding approach for actinides which was -- that figured in the most recent NIOSH

report but we did not address back 2017. So as far as sequence he'll address that after NIOSH presents. That way you'll have a sense of what that proposal is.

Anyway, again let me just say that -- let me see. If you can go to slide, the first slide, Position 1(a). I'm not going to give the -- so much the background. I think NIOSH has a very detailed summary of the ER background, so I'm just going to defer to them to save time. So we'll just go right to pretty much our positions. And I'm on Position 1(a), Contamination Control. And this one is somewhat more detailed as you'll see in NIOSH's report as well as our response, much more detailed and with more subsets than the other positions. So just bear with me. This is going to be -- this is going to seem a little lengthy and detailed, but the others are very, very brief.

Okay. The first thing I want to emphasize is that the finding that NIOSH makes that the INL operating contractor was treating the burial ground as a, quote, low priority prior to 1969, December of '69, was actually a conclusion reached by the Atomic Energy Commission's Idaho Office.

And I want to clarify that because in NIOSH's response that seems to be attributed to SC&A, and actually all we're doing is citing what AEC found back in that time frame. And we defer of course to AEC as the more authoritative voice on that question of priority since they were the governing entity at Idaho and had done the independent reviews of the program.

I think it's fair to say that NIOSH makes -- and we've gone through their most recent report in some detail -- has made quite a bit of the available procedures, memos and other documentation that again they contend is evidence of a mature radiological control program and, as they put it, one that does not tolerate contamination at the burial ground.

However, in our report we offer some of the following responses, and I think we've outlined these in the

report. We didn't detail them all in our slides, but we think they're pretty specific to the items that NIOSH has raised.

The first one, as far as NIOSH's reference to a 1961 management memo -- and this is highlighted I think as you'll later see in the NIOSH slides. This 1961 management memo, which basically indicates that contractor management would manage the burial ground, much as it would manage the rest of the site as far as RADCON -- we just want to emphasize that if you look at the details of that statement, it's part -- it's in response to what essentially is a new contract between Phillips Petroleum, which was the original contractor at Idaho, with the Atomic Energy Commission.

And what they're doing there is stressing the importance of treating the burial ground like the rest of the site, but from our standpoint we see this as actually a management expectation or a goal and not necessarily reality in terms of what was actually practiced in the field. And I guess my perspective is that managers and contractors came and went at Idaho, and as well as at the other DOE sites over time. And it's just a normal course of business.

And the question of what was being done on the ground is probably the real issue and we think that the interviews and the comments of the workers and the statements of the Atomic Energy Commission at the time are probably much more persuasive and important than what line management may have intended or wished to see happen back in 1961. So we just want to point that out, that this is where I think the contemporary observations and the experiences of the workers at the site in terms of what actually happened is critical.

And again in the -- in its response to our 2017 review NIOSH observes that site work permits were in fact applied and used at the burial ground. And we don't disagree, but our review of those SWPs, those permits, show that they tend to emphasize industrial

safety precautions. And that's not too surprising.

The steel-toed shoes, the eye protection, whatever it might be in terms of the kinds of operations at the burial grounds that were happening certainly make sense. There are some cases where monitoring, rad monitoring surveillance would have been required and -- but there's no provision for follow-up bioassays that we could find.

So I think, yes, there were permits written for the burial grounds, but if one actually scrutinizes those permits, I think you'll find a wide variety of precautions and those precautions in a lot of cases were for industrial hygiene and safety rather than rad.

NIOSH also notes that smears were used extensively, but we present documentation and HP interviews that indicate there was no smear counting at the burial ground itself and that smear counting equipment, much of which dated back to the 1950s, had by the 1960s become outdated and deficient as found by the operating contractor itself. So this is from a review that the contractor had done.

Moving onto occupational air sampling, I think both NIOSH and SC&A agree that low and high-volume air samples were taken, but not routinely, and there was no -- not necessarily any procedural protocol that required it other than for the Rocky Flats drum dumping. And I think there's a photo that you'll see that shows some air sampling done by a dumping truck.

And just note that that sampler is positioned on the rim of the trench, so that's not going to necessarily give you a representative air sample for the worker that might have to go in the trench to do any clean up or adjustments for the drums, or for the -- necessarily the bulldozer operator who later is going to compress and crush those drums. So I think that's one thing to keep in mind was the kind of air sampling that was done.

In terms of alpha monitoring it's pretty clear it wasn't considered reliable by a number of the health physicists at the site, at the burial ground at the time. And I think you'll see those quotes -- and I'm not going to go through all the quotes, but those quotes are on page 14 of the un-redacted version of our report.

Okay. Finally, for contamination control writ large, I think again documented interviews -- and we did a number of interviews, and actually between NIOSH and SC&A over a number of years there were quite a few interviews with workers and health physicists.

We certainly found that many of the statements, many of the comments spoke to prevalent contamination, low-level contamination, but contamination nonetheless associated with spilled drums and material in the trenches and whatnot. And again this is in our report, the un-redacted report on page 13. Again there's numerous excerpts of those interviews with health physicists, the HP techs and the workers themselves that were handling the waste. And I think that pretty clearly establishes that, yes, you did have contamination related to that operation and that this is something that certainly the workers at the time recognized. And all we would say is that the Work Group should weigh these statements by the individuals who were at the burial ground during the '50s and '60s against the claims that contamination was not tolerated and that because there were, quote, no contamination or little contamination that may preclude ever having to do a special bioassay.

So I really do think that you have to go back to the contemporary experience of the workers themselves and the health physicists who were lead responsibilities for RADCON to look at that question of whether or not there was in fact contamination at the burial ground.

To move on, as far as NIOSH's opinion regarding a health physicist being in charge of both health

physics and the operation of the burial ground being a good thing, all we can say is that AEC categorically disagreed with that. They saw an organizational conflict of interest, and I think we view it the same way.

The AEC Idaho Office conducted an investigation of leaking Rocky Flats drums and other irregularities at the burial ground and they established that one root cause was the -- what they saw as a conflict of interest.

In their view this was not a positive attribute or a positive thing. They thought the HP organization could not independently judge RADCON safety issues while pursuing the mission of waste management as well. In the end AEC demanded that the two management functions be separated. And this was -- this happened in 1971, but it was pretty clear in the AEC finding that this was a long-standing functional arrangement for the burial ground. So this wasn't something that just happened.

And in terms of the implications of a conflict of interest we, I think, included a comment we received from one of the HPs that we interviewed. It's redacted, but you'll see it on page 14 of our un-redacted report. I think that comment is pretty telling because it certainly points out that when a health physicist wears two hats, one for mission and one for RADCON, it can put that HP in a position where the judgment made may not be in fact particularly in the independent interest of radiological protection. And I think that's the concern that the AEC found as well.

But I just wanted to make sure that was clear that that was the basis for the reorganization. It wasn't an overall finding of poor radiological performance at all, but certainly the concern over how judgments would be made and what the implications of those judgments would be.

Okay. My final comment on the first position is that -- and this is a new finding, so I'll just comment on this. It's in our report in May, but there's a new

finding that because polyethylene liners were used in the Rocky Flats drums, even if they were flung open, the contents would not likely spill out.

And as noted in our report there are a number of reasons that we think this assumption doesn't necessarily hold up, but I think the most conclusive finding that we highlight is that the contractor themselves did a survey of retrieved drums; this was in the early '70s, 1972 to be exact, where they were -- they wanted to see the status or the exact conditions of the contents of those drums. These are Rocky Flats drums that were buried. And of the 16 drums that they surveyed they found that three had no liner at all. Five had liners that were folded but not taped shut. Three were found to be taped shut, but were torn or rotted. And so of the 16 only five were actually found taped and intact. That's about two-thirds of the liners that were surveyed in those drums were in fact -- that were found to lack integrity. So two-thirds of the drums, of the 16 that were surveyed, did not have polyethylene liner integrity.

So we just wanted to point that out that -- and that's in addition to the empirical evidence that when drums were -- the lids came off the drums; and this is from interview accounts by workers, the contents spilled out in the trenches. So we have that as well. So in a sense we just don't think there's any question that there was some contamination from the spillage from those drums.

Any questions on Position 1(a)? I know that was kind of lengthy, but I wanted to give you at least a thumbnail on what we found in our report. Okay. I'll move on to the next slide, Position 1(b), which is dealing with rad waste source terms.

In terms of monitoring I think it's pretty clear that we accept NIOSH's position regarding mixed fission products being controlling for on-site waste, but our problem is more the off-site waste, the Rocky Flats waste, which we think -- where we think the source term is more uncertain. And I think within that

conclusion presented by NIOSH we would disagree that -- with the contention that the lack of special bioassays can be explained by the little contamination that existed at the burial ground. And again, as we pointed out earlier, I think all the commentary by HPs and workers at the site would suggest otherwise in that regard.

Okay. If we can move to -- I was saying we would move faster. If we could move to Position 1(c)? This is on special bioassay program implementation.

And we agree with NIOSH that -- and this is from their report -- that there's no way to find evidence of a worker in '52 to 1970 being placed on special bioassay as a result of a special contamination event at the burial ground. We disagree however that -- again that the lack of special bioassays can be traced to lack of personnel contamination. So again, that's our point on that.

Any questions on I guess 1(a), 1(b) and 1(c)? We kind of split it up that way. All relate to contamination control.

Member Beach: Joe, I just have a quick -- I don't know how off-topic this is, but the flooding that occurred in the burial grounds, what kind of effect would that have had for the spread of some of this contamination with the 16 drums you identified as two-thirds of them coming open? Any ideas on that?

Mr. Fitzgerald: I'm sorry. I missed the very beginning of your question.

Member Beach: The burial ground flooding. I know there was a couple of times that the different pits flooded. Would there be any contamination issues from those flooding incidents?

Mr. Fitzgerald: Well, yes, I mean there was some modicum of contamination from the flooding itself that happened in '62, and they did quite a bit of sampling from that. As far as any impact to workers I think it was relatively minimal because they actually

did some fair amount of monitoring while the flooding was going on and after the flooding was done, but I don't recall that being a big issue in the aftermath.

Member Beach: Okay. Thanks.

Chair Schofield: Joe, this is Phil. Could I ask you a quick question?

Mr. Fitzgerald: Yes.

Chair Schofield: Okay. The drums particularly from Rocky Flats, they did not -- at that time they were not doing a characterization of the waste they were putting in the drums, did they?

Mr. Fitzgerald: Well, they had manifests for some of them, not all of them necessarily, but where Rocky would do -- they would do scanning of the contents and inventorying the contents before they would seal them and send them, and Idaho would do some exterior monitoring and smearing when they received them. But the -- as far as the specific contents, radiological contents, that was less detailed, less obvious. So for Rocky Flats drums there wasn't a detailed accounting of the activity levels inside the drums themselves, although there was -- it was pretty clear what the material was and what the nuclides would be. But the distinction of how much of what, isotopes and whatever, that wasn't the, necessarily the information that you got.

Chair Schofield: Oh, okay. Thanks.

Mr. Fitzgerald: And I think before -- and maybe NIOSH will present this -- I think as I recall, before '64 there wasn't a lot of detailed information on drum contents as well, so it got better later from that standpoint.

Moving on to what we call Position 2. This is the dose reconstruction approach with actinides and mixed waste. And I think I just want to reemphasize we agree with NIOSH that the mixed fission products, the MFPs, are the dominant source terms for on-site

waste, but where we're more concerned is regarding the off-site waste and the conclusion that I guess the burial workers were necessarily exposed to similar levels of mixed fission products as other un-monitored INL workers.

So certainly for on-site waste we clearly see a means by which you can take mixed fission products as the dominant nuclide, and certainly that's what the site did in terms of their surveillance and whatnot. But as far as making that assumption or jumping to the assumption that you can assume that the exposure experience at the burial ground was similar to the reactors and CPP, we just don't know what the basis of that would be and we didn't see anything that really put a sort of punctuation point on that. So that's something that we're looking for still.

I want to go ahead -- this is the piece that I referred to earlier that Bob Barton was going to present that related to the new proposal that was contained in the January report using the additional workers from the '78-'79 exhumation project to more or less back-apply that information to bound actinides. We're going to -- I think Bob's going to address that after NIOSH presents because that's probably the most substantive new piece of information or approach that's been added since 2017. So along with what Rashaun mentioned, we'll do that after NIOSH presents.

But if you can jump past that, which is Position 2 to our slide on Position 3, I'll continue with the program issues and more or less wrap that up, and we'll come back to Position 2 with Bob after NIOSH.

And Position 3 is the rad monitoring program, and this is the question of the rigor and defense-in-depth of that program. And as we noted earlier, SC&A doesn't question that INL had the management directives, the RADCON procedures and the records to demonstrate that it implemented a monitoring and contamination control program. It's just that the statements made by its workers, made by INL

workers at the burial ground, again the HPs, the waste handlers, as well as the AEC and contractor managers at the time -- these seem to contradict the stated NIOSH thesis that a low-level rad waste landfill of the '50s and '60s had a mature RADCON program that exemplified a defense-in-depth protective strategy, and in the end one that did not tolerate contamination. So again, we just again see a contradiction from the statements made by the workers and that particular thesis that's being advanced.

And in our final slide, I'm going to jump past the conclusions to the final slide, SC&A views the burial ground as having a contamination program commensurate with the rad waste landfill of the era. This is the '50s and '60s when less management priority was assigned to such operations and sporadic low-level contamination from the unloading and dumping of drums was a common part of work and frankly did not warrant a special response from the rad control program.

I think that would be how we would view it. And that's a decidedly different view I think than what NIOSH presented in the ER and what is presented in the January 2020 response to our 2017 report. So what I think the Work Group -- I just want to underscore that, is you essentially have two very different narratives, very different takes on how the burial ground was managed as compared with the rest of INL.

And again our conclusions are summarized in the next-to-last slide, and I pretty much have covered them so I'm not going to repeat that, but I want to make one final note because this is sort of a hand-off to what Bob will present last, is that in the January 2020 response I think it's fair to say that NIOSH has added a fair amount of post-1970 data and operating perspectives that came out of the new RWMC, Rad Waste Management Center, the RWMC Waste Retrieval Program, and has back-applied it, has back-applied this experience to the burial ground of the

'50s and '60s. And I think Bob is going to get into at least one particular concern that we have, how that back-application may pose a real problem as far as representativeness.

But I think one thing I just wanted to point out in closing is that with the advent of waste retrieval and above-ground storage this new RWMC became the pilot showpiece for DOE in this regard complex-wide, and under that spotlight upgraded its RADCON program, upgraded PPE, added routine bioassays and exercised what certainly could be considered stringent contamination control procedures.

So as far as the tact of looking to the late '70s for operational perspective and data to back-apply to the burial grounds of the '50s and '60s I think one has to be very careful, and that's kind of what our admonition would be and one would need to very critically look at whether you're dealing with apples and apples and that there's representativeness to what you're doing when you do that. I think there's some real concern on our part that that may be a problem.

Okay. So that's the programmatic piece of our presentation and Bob will come back later with an analytic piece on the back-application of the '78-'79 data, as I said.

Any questions from the Work Group?

Work Group Discussion

Member Roessler: Joe, this is a question from Gen, and it's probably directed to more than just you, but as you've gone through this it's quite obvious that you're putting a lot of emphasis on the interviews with the various people, contractors and workers, and you even said it was critical. And that's as it should be because that will present the perspective that seems to be missing.

And I know there were many. I was involved in I think most of the interviews, not all of them. And of course

what we did is -- some of us at the interviews took notes in order to put this on record and these notes were then given to a transcriber who put them in the -- and I assume they're in this Site Research Database.

I would like to have access to those. Maybe I should have been able to get them before, but it just occurred to me when I read your report. And I think it's really important since we have new Work Group Members for them to be familiar with the whole perspective for them to actually go back to the originals of the interviews.

And I guess my main point on that is as I think back on the interviews, the wide spectrum of comments -- and I won't go into that much now, but I want to myself make sure that the comments that you selected for your report are representative and not just selective.

So now getting to my question: Is that database accessible to Work Group Members?

Dr. Taulbee: Gen, this is Tim Taulbee. We can provide you with a listing of all the SRDB numbers or the actual interviews themselves for those that were concerning the burial grounds. That's not a problem. We can provide that to all the Work Group Members.

Member Roessler: Okay. Was that available? I can't get on my CDC computer, so I didn't know if I just missed and it was available and I should have --

Dr. Taulbee: They're all in the Site Research Database at this time, but finding them, locating them can be a little difficult. So we can pull them out from the Site Research Database and provide them to you all.

Member Roessler: Okay. So all Work Group Members can get them. Now I know SC&A obviously has gone over them and NIOSH has, and perhaps you're going to have some comments on that, but at that point -- this point that was my main question.

Mr. Fitzgerald: Yes, and I think that's true. I think it would be very helpful for all the Work Group Members to review all the effort that went into talking to the -- not just again the waste handlers, but also the HPs, HP techs. There's also a memorandum written at the time by the Atomic Energy Commission and the contractor. All of those I think is the -- are the body of contemporary perspectives, not conclusions reached much later, but actual contemporary perspectives.

And as contemporary perspectives I think another thing that is important to keep in mind is that if you interview -- and I think we did, all of us did, enough workers, and maybe it was 20, 30, 40 or 50 in the end, you're not going to get in certain topical areas 100 percent unanimity as far as what was recalled and what was considered to be the case. I think in most cases we're talking about 30, 40 years later.

So in the context of asking about do you remember certain monitoring, do you remember certain contamination, depending on, one, the worker's recollection; two, the type of job they had; and three, perhaps what stood out as important or not, I think you're going to get a variety of answers.

But I think what our concern is is that when you come to a categorical conclusion without much qualification that a low-level waste landfill of the '50s and '60s did not have much in the way of low-level contamination in the face of dumping thousands of drums, that part I think ought to be queried very firmly by looking at what the workers recollected from that time frame.

Because I think when one goes to that kind of conclusion you really want to be careful about making sure that the contemporary perspectives align with that. And that would be certainly our viewpoint as far as how one looks at the interviews. It's almost one of challenging that premise. And if you find your senior HPs and HP techs -- let's say 75 percent of them are accounting for contamination, then I think you'd have to question whether that premise holds or not.

So that's kind of our perspective. When you're looking at an operation such as a rad waste landfill where you don't have a lot of records and you're talking about a time period that goes back quite a ways, you really are going to have to rely on, probably more so than other cases, first-person accounts. So that's the reason why I think there's a particular importance attached to looking at these accounts. So I agree with you that certainly all the Work Group Members should look at all these accounts and weigh them again in the context of the premise that's being advanced in the Evaluation Report about the lack of contamination or low-level contamination at the burial ground and the implications of that for how one would do dose reconstruction. So that's kind of how I would view that.

Member Roessler: Well, Joe, I certainly agree with you that it's important that -- and there was a tremendous amount of time and effort put into this. So I'm pleased to know that Work Group Members can get this data, and perhaps later we can talk more about how that -- how we can get that. So I think we can move on then to the -- your next part.

Member Beach: This is Josie. One thing I want to bring up since we're talking about interview notes, and I don't know if we can take it up here, Rashaun, I'm going to leave that to your discretion, but the inconsistency in -- regarding the redacting of the interview comments between SC&A and NIOSH's reports. I think we need to take that up as a discussion maybe as a full Board, or -- I'm not really sure. It seems different in these reports for INL than in the past reports.

Ms. Naylor: Josie, this is Jenny Naylor with HHS Attorney. I'm happy to take that now because I'm not quite sure talking more specifically about some of our legal concerns would be appropriate in the public forum, like the Advisory Board. So I'm just sort of going to touch on some of the concerns that we have with the redaction.

And you're right, there is some inconsistency between the redaction in the 2017 and the 2020 burial report. And with each iteration we're basically looking at how much information has already been released out in the public. And so I just want to frame this discussion by saying that when I do the legal review and recommendations to the Advisory Board, I'm actually doing it on behalf of the Department and it's to support the Department's proactive release under FOIA to the public.

So this redaction is not to the Board's document, but you should still receive the un-redacted and you should still have access to all the documents relevant to your petition evaluation in the SRDB, which is where you can find the raw source material.

So there are different people who are providing these redactions, so like I say, I do it for the Advisory Boards and technical documents, and NIOSH actually has a different set of staff that supports that redaction process. But the redaction is actually made -- or release of these public -- release of these documents is actually made under FOIA's proactive release to the public. So this is not the same as requesting a FACA document under the Advisory Board's Record Request Policy. So I'd just make clear that that's what we're coming now.

So I also want to remind the Board that under 42 CFR 83.15, Subsection B the individual Board Member has to take steps necessary to prevent the disclosure of information of a personal nature or concerning the petition, petitioners or any others, and that the disclosure would constitute a clear unwarranted invasion of personal privacy.

And when a member brings a case against -- based on unreasonable infringement of privacy interest against the federal government, in that suit the defendant is the HHS Secretary, not the SC&A authors or individual Board Members. And the resources used to defend that lawsuit or any payout or settlements for the lawsuit is also funded by the

taxpayer. They do not come out on the pockets of SC&A authors or individual Board Members.

So now let's talk about like the document review process. When I review SC&A documents, I put my recommended redactions in a comment balloon. I don't actually apply the redaction. The black strips that you see in the public versions of the document, that's actually done by the -- I think the document managers for SC&A.

So when I was reviewing the 2020 burial ground report I did ask why there is such a heavy use of block quotes from interviewees and from CATIs, because I know that SC&A tends to summarize notes from interviews or CATIs instead of just copying and pasting. So I sent an email to SC&A back in May specifically asking why there was such a heavy use of verbatim quotes, and my concern at the time is that using such verbatim quotes repeatedly, particularly for a couple individuals, might undermine the Agency's efforts to preserve the interviewee's privacy.

And I also questioned whether this is a good practice to the extent that verbatim publications of statements may create a chilling effect on potential future interviewees.

So I understand that these interviewees are not whistleblowers and they're not really afforded that level of confidentiality, but it's important to make sure that workers will be willing and comfortable to talk to us.

So when I stated this to the SC&A document manager, I specifically asked her to let me know if the authors have any questions or concerns with the redactions. And then the next day I received a response from SC&A explaining to me that the verbatim quotes are important because it's the precise wordings and the interpretation of that quote that there are issues here, which is fine. But I didn't hear anything else about the redactions.

So I'm still -- so I think a couple of days ago I'd actually gone back to do a cross-reference between 2017 and 2020 reports. I am still very alarmed at the frequency and the intensity of verbatim block quotes, sentences and phrases from certain individuals just littered through the pages in the 2017 and 2020 reports.

So at the start of every interview I know that you -- SC&A, Board Members or NIOSH informs the interviewees that your participation in the discussions are voluntary and that they will be treated in a confidential manner. So I'm really not sure that our confidentiality assurance to interviewees actually means anything if we're publishing these verbatim interview statements. So for --

Member Beach: Hey, Jenny, can I stop and ask you a question on that?

Ms. Naylor: Sure.

Member Beach: So the interview notes are given back to the interviewees, they read them and then they accept and basically give the permission for us to use those also, is that not true? And we would not use them if we did not have the written consent from the interviewees.

Ms. Naylor: We don't have written consent. And also the Advisory Board Members and SC&A are in no position to provide confidentiality assurance. Only the Department gets to do that, and there's a proper policy for doing so. So Advisory Board Members and the SC&A are in no position to provide this security -- confidentiality certification. That is -- there are separate procedures for doing that. And also for them to actually waive their privacy interest, we would actually have to ask them to sign a privacy waiver authorizing them to actually use their statements.

But I mean the bottom line is that is this a good practice going forward? Board Members who are participating in this deliberative process have access

to the source material un-redacted. So what we're talking about here is whether the public members need to know -- what we're trying to do here really is to sort of balance the statutory responsibility between protecting the workers' privacy while facilitating meaningful participation from them, not just at public meetings, but also providing their recollection and unhindered thoughts with the Agency.

So I think that's what -- that's the crux of the issue here. If we make the habit of block quoting interviewees, how do they feel about that the next time that we want clarification from them or we want to interview them again? So I think those are just the implications that you probably want to think about and balancing how that redaction in a public version interferes with your deliberation and your responsibility to provide advice to the Secretary.

Member Beach: Okay. Thanks, Jenny.

Rashaun, I'm wondering if we can request a review of this with select Board Members.

Dr. Roberts: Can you say more about what you would have in mind?

Member Beach: Well it just feels like this needs to be an OCG -- or an OGC review process. This -- anyway, I understand what Jenny is saying, but this is really a policy question for the Board.

Dr. Roberts: Yes.

Ms. Naylor: Josie --

Member Beach: And it's changed from --

Ms. Naylor: No, Josie --

Member Beach: -- what we've been doing the past 20 years here.

Ms. Naylor: No --

(Simultaneous speaking.)

Ms. Naylor: -- and this is not a Board policy issue.

Member Beach: Okay. Well, it feels like -- it just feels like a Board policy question and an OGC policy question here. I don't know what anybody else --

Ms. Naylor: I disagree that this is a policy issue. This is basically OGC needing to weigh the risk to the Agency for unwarranted intrusion into a public member's privacy and balancing that with the Department's proactive release policy under FOIA.

Member Beach: Okay. It just seems new, Jenny, now more so than --

Ms. Naylor: No, it's not.

Member Beach: -- in the past report.

Ms. Naylor: The 2020 -- no, Josie. What has changed is that in the 2020 report there are two individuals whose interview summaries were used in multiple instances. I think one of the interviewees actually had five block quotes or phrases or sentences attributed to that person. So the question here is how do we still balance this statutory responsibility to prevent this unwarranted invasion to personal privacy with the Board's responsibility to deliberate over these materials and make a presentation -- make advice to the Secretary. Like I said, Board Members always have access to un-redacted material.

Member Beach: Okay. I guess for me I'm just -- why the difference between 2017 and 2020? It just -- it's like the policy changed or something changed that we're not aware of. So --

Ms. Naylor: No, it's not policy change. When we are doing the balance of -- when we're doing these risk assessments and also we try to balance that need with the Board's deliberative process, we're basically looking at how much information is already made

available. Okay? And so in 2020 there were a lot more quotes that were put in this report that was not in 2017.

Member Beach: So what's the difference between the block quotes that NIOSH used in their report and -- it seemed like they -- the block reports were okay and just the name was taken out, and it seems to me that would do the same with SC&A's reports. The quote could stay but the name associated with it should be blocked.

Ms. Naylor: So, Josie, the issue here is not the use of block quotes. It's the frequency and the intensity of using block quotes from certain individuals. This is a case-by-case evaluation. So you could use block quotes. But what happened here in the 2020 report is that there were five quotes attributed to one individual and it gives me pause in terms of what that actually means going forward. Is this a best practice?

But I think what SC&A explained to me is that this is special because the actual quote -- the actual wording and the interpretation of the wording aren't at issue here. I haven't seen this level and this intensity of using block quotes from one individual in however long I've been with the program.

Member Beach: Okay. Thank you.

Dr. Roberts: Okay. Question, Joe. Were you done with your presentation?

Mr. Fitzgerald: The programmatic side of it. And as you were pointing out earlier, Bob Barton will follow NIOSH's presentation, which is next, with the more -- sequentially the latest rendition, so it makes more sense for him to go last.

Dr. Roberts: Okay. Great. So at this point we can move on to the NIOSH presentation, Phil, if that's okay with you.

Chair Schofield: That's fine with me.

Dr. Roberts: Okay. And I believe it's Mitch Findley who will be doing that presentation.

Mr. Findley: That is correct, Dr. Roberts.

Can everyone hear me okay?

Chair Schofield: Yes, we can hear you fine, Mitch.

Mr. Findley: Okay.

Chair Schofield: Can you hear us?

Mr. Fitzgerald: Yes, the presentation, is it available to be brought up?

Chair Schofield: Yes. John, do you have it ready?

Mr. Cardarelli: Yes, I was questioning whether or not we use -- hold on, the Skype. So shall I bring it up and share my screen?

Mr. Findley: Yes.

Mr. Cardarelli: Okay.

Mr. Findley: So it's good to hear some familiar voices this morning, or I guess this is afternoon now. Hope you're all doing well during these unusual and trying times.

Since we've not met for a while I thought I would provide some review prior to getting into the NIOSH responses to SC&A's review of the burial ground from the SEC-002019 Evaluation Report.

John, could you go to the next slide, please? And so what I've done is I've broken this presentation up into three parts. You'll be glad to hear the first two parts are relatively short with about three slides each. The first is just to review the burial ground from 1952 to 1970.

And the second part is just to review the SEC Evaluation Report conclusions for the burial ground. Okay? And I have listed the dates of the beginning of radiological operations on July 3rd, 1952 through the

end of the evaluated period of December 31st, 1970.

And then we'll get to the heart of the presentation with the responses to SC&A's review. Much of that will kind of look and sound familiar since Joe has spoken about the -- in his presentation.

Next slide, please? Okay. So you should be looking at a slide that's got a number of images on it. Just to kind of re-familiarize everybody with the site, on the left-hand side is the INL Reservation, which is trimmed out in a darker black line. I have got a line drawn in the bottom left hand which points to the burial ground location on site. And if you look about the 2:00 position from the burial ground, you'll see a blue box that says CFA. That is the Central Facilities Area and that will become important as we discuss the burial ground since the burial ground was the location that was actually managed out of the Central Facilities Area.

The photo insert at the top right is basically a figure of what the burial ground looked like in 1955. Very simplistic. There was a road that went in. It was just basically an empty field, if you will, that had a trench in it. And so trenches were the first thing that were used at the site to bury on-site-generated waste. So this would be the primarily mixed fission product waste that Joe discussed.

There's a little bit -- there's a little insert there of a gate going into the burial ground. That's the entry road. And this is just a control gate to get into the burial ground. And on that sign, you can't read it because it's kind of small, but it says entry only under the Atomic Energy Commission Health Physics authorization -- you have to have authorization from the AEC HP. And so that gets again back to the point that Joe was making about that the AEC had not only radiological control responsibilities, but had management responsibilities as well.

So the bottom right-hand photograph, that's an aerial view of the burial ground in 1970, which is the end of the evaluation period. And you'll note that

there are no buildings, anything like that. The first building was the 601 Building, which was not built out there until 1976. You will notice in the foreground that there is a long rectangular darker area. That is actually an asphalt pad that had been poured and was called the Transuranic Storage Area Pad; and that's Pad 1 there, that was used around that -- implemented about that time for above-ground storage of transuranic waste.

I should point out that while the burial ground was kind of a location on site, it really wasn't an area. It didn't get its own dosimetry code until 1975, and even then it had maybe 20, 30 people on the monthly exposure reports.

Next slide, John? Just a recap of some important events that occurred at the burial ground. As I mentioned earlier, in July '52 the first waste trench was opened for disposal of INL waste. Some of the initial Rocky Flats waste was actually placed in some of these early trenches as well, but as the waste shipments increased and there were larger items for burial, waste pits were implemented. And so these were fairly deep large holes in the ground, if you will, that -- and you'll see pictures a little later where waste was placed.

The first TRU shipment from Rocky Flats occurred in 1954. And there was mention earlier of dumping of waste drums. That was for a period of time between November of 1963 through late '69. Prior to 1963 they were hand-stacked. There were some concerns about cost and external dose exposure, so they started doing some dumping which -- kind of mass dumping. And they stopped that in 1969 for a number of reasons which I'll cover later. One of the reasons was they were running out of room at the burial ground. And it's much more orderly to place the drums and stack them than to dump them en masse, if you will.

One other item during this time period was that it was -- the INL burial ground was a designated burial

site for other AE sites, AEC sites and some non-AEC waste generators. So these were things like universities, research centers and even a little bit of military waste was sent there as well.

Ms. Beach asked earlier about the flooding events. There were two significant flooding events during this '52 to 1970 time period. The big one was the Chinook flood event in 1962. They made some measures to make sure it wouldn't happen again because the -- it was -- it impacted the burial ground pretty extensively.

The second flood event in 1969, there was some snow drifts which blocked some of the ways for some of the water to leave the burial ground area, and so they ended up having a second flood event there.

Next slide, John? The picture to the right should be a familiar one to those of -- following the work on the burial ground. This was the first waste retrieval that had ever been done at the burial ground. It was performed in November of 1969. They were looking for a specific Rocky Flats waste drum and was one of the reasons why we had to do a revision to the SEC-00219 Evaluation Report.

In the '69-1970 period -- again I will get into this a little more later, but there were some policy changes requiring how solid TRU waste could be stored. And that's all I'll say about that right now other than the fact that in November of 1970, that's when the first waste was stored on that asphalt pad that I pointed out in the aerial photo of the burial ground in 1970.

Next slide, John? Thank you.

Next slide. So regarding the SEC-002019 petition for INL, the petition was received on July 8th, 2014 and the basis from the Form B of the petition was that -- no personal knowledge of internal monitoring for plutonium, neptunium or fission products. So the worker didn't think they were -- the former worker didn't think there was any monitoring for these things. And the date range was from 1949 to 1970.

Qualification went through and the petition was qualified in September of that year, and it looked at all areas, all workers at INL from 1949 at the beginning of the year through December 31st of 1970.

Next slide, John? So at INL we -- during our investigations into documentation out there and also lots of interviews, which have been mentioned already, it was pretty apparent that all workers in INL's radiological areas including the burial ground were monitored for external radiation exposure. Dosimeters were required for entry into any fenced area at INL and this included the burial ground. And there are provisions in the Tech Basis Manual for INL and Argonne National Lab-West. I should mention that those were two separate sites basically until 2005. ANL-West is known as the Materials and Fuels Complex now at INL. The ANL-West Evaluation Report was SEC-00224.

So for the SEC Class that we added for the Chemical Processing Plant we did some extensive reviews of the external dosimetry, and even including temporary dosimetry to ensure that Class members could be identified by the external dosimetry records that we have. As a matter of fact I think Bob Barton's going to talk a little bit more about some of the temporary badges for the AE-314 that was done for the Chem Plant from '75 to '80 a little later in this meeting.

Next slide, John?

Participant: On internal monitoring?

Mr. Findley: So for internal -- I'm sorry? Yes, that's correct.

So for internal monitoring for the SEC Evaluation Report we said that we would assess missed strontium-90 or cesium-137 intakes in accordance with OTIB-0054 and OTIB-0060. The potential intakes for other radionuclides when mixed fission products were present could be estimated on a case-

by-case basis in the current internal dosimetry -- or internal dose tech basis.

Next slide? This was the summary or conclusion table that we came up with for INL, and you'll notice that for most everything we think that the dose reconstructions were feasible. You will notice from '67 to '70 out there are a few lines that have -- they're lighter green in color. And these are where we've indicated that we think co-exposure models are necessary during that time period. And the reason for that was a shift away from in vitro bioassay to a reliance on in vivo bioassay.

However, at the same time they changed the frequency of the in vivo counting from once a year to every four years, which caused us some pause and this ended up being the impetus basically for developing a beta-gamma co-exposure model for INL.

Next slide? Okay. So again this will be the heart of the presentation. These are responses to the SC&A review that was performed in response to the Evaluation Report.

Thank you, John. So as Joe mentioned, there were three positions that SC&A evaluated. The one that you're looking at on the screen -- I will not read it to you because you've seen it, but this is Evaluation Report Position 1. And this had to do with contamination control, as Joe indicated.

So the format for this kind of going through this is we've got things from the Evaluation Report that I have listed here. Then we'll talk about the identified positions that SC&A had. And then when you start seeing some blue text that says NIOSH response, that will be kind of the response to the review that SC&A did, or the positions that they reviewed.

So there are three sentences in that -- can you go back just one slide real quick?

There are three sentences in that position. And John,

if you'll go ahead and go to the next slide now. As Joe indicated they took that position and broke it out into three different positions. These were addressed separately. And again I will not read these to you since we've seen them before. But we're talking about an internal dose monitoring program for Position 1(a). For Position 1(b) we're talking about controlling radionuclides. Position 1(c), the use of special bioassay.

Next slide? Thank you. So the preliminary finding for our assertion, the burial ground's internal dose monitoring program was based on a strict contamination control program with entry and exit monitoring. SC&A has questioned whether the term strict is really an accurate term here for contamination control and believed that there was a more, in their words, haphazard inconsistent approach to limiting contamination during this time period and that there was inadequate health physics monitoring and little evidence of contamination-driven bioassay.

Next slide, John? Joe mentioned the excerpt here. So this is when Phillips Petroleum, which was a primary contractor at the site, or prime contractor, took over operations of the burial ground. They kind of laid out what their expectations were for running the burial ground, or for running the -- operating the burial ground. And I included this because I think it's important that you know what the management expectations are being set out.

Basically we're asking that the burial ground be run just like --

(Audio interference.)

Mr. Findley: If I could get -- can't hardly hear. Hello?

Chair Schofield: Somebody mute their phones.

Dr. Roberts: Hello? Please mute --

Mr. Findley Hello?

Dr. Roberts: -- phone.

Chair Schofield: Yes, somebody needs to mute their phone.

Dr. Roberts: Hello? Someone's phone is off mute. Please mute, please.

Hello? Someone's phone is off mute. Please mute, please.

Nancy, is there any way to mute the phones on Skype?

Ms. Adams: -- line needs to be cut.

Dr. Roberts: Hello? Someone's phone is off mute. Please mute, please. There's a lot of interference.

Chair Schofield: You may need to have Zaida cut that line. That's worked in the past when this has happened.

Dr. Roberts: Nancy, do you know if there's a way to mute the phone?

Ms. Adams: There is, and I'm trying to get a hold of the operator to do that.

Dr. Roberts: Okay. Thank you. Hi. If you can hear me, if you could please mute your phone.

Ms. Adams: I don't understand why we're not getting service from the operator.

Dr. Roberts: Now it's on the laptop, too, so someone joined audio on the laptop.

Chair Schofield: Dr. Roberts, you might be able to mute all folks, but I don't know if you can then un-mute only one person, by hitting the participant actions button in the lower left-hand corner.

Dr. Roberts: Okay. I can try. I don't see where I can do that. Again, if everyone could mute the phone.

Ms. Adams: Well (audio interference) not muted now,

so --

Dr. Roberts: Yes. Would it make sense for people to hang up and get back in?

Hello? Please mute your phone.

Mr. Calhoun: Rashaun, I think maybe this -- this is Grady. This may be what John said, but if you look at the participants and you click on that, a box comes up and you can say participant action. And then you can hit mute audience. I tried, but I can't do it.

Dr. Roberts: Yes, I don't see where I can do it, but let me try.

Mr. Calhoun: If I looked -- yes.

Dr. Roberts: Okay. No, that's not it.

Mr. Findley: I'm not sure the person's actually on the Skype because it looks like everybody's either muted or is not -- actually has their audio turned on for the Skype session. I think that noise might be coming from somebody just on the conference line.

Chair Schofield: Yes.

Dr. Roberts: I'm wondering if we could have -- hang up and call back in. Would that make a difference?

Participant: Or you could say the person with the crying kid in the background needs to mute their phone.

(Laughter.)

Dr. Roberts: I don't think they're listening though.

Mr. Lewis: This is Mark. I've called in a couple of times, went back. If you all hung up and done it again --

Ms. Adams: How about if we take a couple-minute break and then call back in at --

Dr. Roberts: 12:30?

Ms. Adams: -- 12:30? Yes.

Dr. Roberts: Yes. Let's try that. Thank you.

Ms. Adams: Hey, it's quiet.

Dr. Roberts: Now it's -- okay. Shall we continue?

Chair Schofield: Yes, it quit now.

Dr. Roberts: Yes, it's gone. Okay. All right. Do you feel comfortable continuing, Mitch?

Mr. Findley: Sure. I was just getting an earful of background noise, and I was pretty sure you guys were too, is why I kind of stopped. Can everybody hear me okay now?

Dr. Roberts: Yes.

Mr. Findley: Okay, great. We can push through if you'd like, and then maybe take Ms. Beach's request for a mercy break after this.

Dr. Roberts: Sure.

Mr. Findley: Okay, so we were on slide 1 of 3 of the preliminary finding for 1(a), and this was the excerpt from Phillips Petroleum Company on the management expectations for operation of the burial ground. This is due again to a contractor change.

I should mention at this time, the burial ground was only open on Tuesdays and Fridays, from 8:30 to 4:00. So, it had a weekly number of hours that it was open, about 15 hours a week. This was not open full-time. And that Rocky Flats waste were scheduled on certain days during the month, so they were not coming in and out, the Rocky Flats waste, every day as well. Next slide, John.

I did fail to mention that on these response slides, where you see NIOSH Response to blue tags, that's what I was referring to earlier, that these are basically the responses to the SC&A positions.

For the monitoring practices at other INL facilities and the evaluation we did at the burial ground, we felt that the radiological monitoring was based on exposure to potential for workers.

In the response paper there are examples of this, where you'll have like a whole body count scheduled and a lot of it depends on where you work and also what you do.

So, for example, a manager may not be counted for a whole body count, whereas a health physics technician or an operator, somebody like that, will likely be counted at a higher frequency. There are also examples of this for in vitro bioassay, as well.

Safe work permits were utilized. Idaho used this term, safe work permits, instead of radiological work permits, that's used at a lot of sites, because they did include some industrial safety precautions as well, as Joe mentioned.

However, there are places on the safe work permits for things like respiratory use and other protective measures as regarding to rad exposure.

Shipping records, again, these are examples of these were provided in the response paper, contamination surveys. Joe mentioned that the place of origin or the originator of the waste, did contamination surveys early on with Rocky Flats. They actually sent an HP tech with the shipment before they got to INL.

The shipments were received in the Central Facilities Area and went through another round of contamination surveys and radiation surveys, before being sent to the burial ground for disposal, or for burial.

The documentation that we reviewed indicated there just weren't very many instances of contamination, from the records. There was one record that's included in the response paper where there were hundreds, thinking of 2-300 dpm of beta-gamma contamination, and even it was sent to CPP to be

decontaminated. So our statement about small quantities of contamination not being tolerated, we think is borne out in the documentation.

As evidenced in the response paper, we provided examples of procedures on waste burial and we found them back as early as 1955.

As has been discussed several times, a health physicist was actually in charge of the radiological control and operation of the burial ground. Everything went through the HP that was assigned at a Central Facilities Area.

In our estimation, it just kind of makes sense that if you're going to entrust an organization specializing in rad control, that strict contamination control would be something that would be a priority, because you don't want the operation becoming highly contaminated, because it adversely affects operations. We could find no data to suggest that this was the case at the burial ground between 1952 and 1980.

Except for the floods, we could not find any evidence of suspension of operations because of poor radiological conditions at the burial ground. Next slide, John.

The photo, or the image, on the right, is actually one of these mass dumpings, if you will, of Rocky Flats waste drums. You will see these are 55-gallon drums, lots of them in the Sealand container. There are three workers to the left of the pit that these drums are being put into, and I put a red box around the air sampling head that was used.

The motor for the air sampler is basically at the foot of the worker to the far left, the one to the farthest of the left, you'll see a little device there. That is the mechanical pump, basically, for the air sampler.

We were not able to find many special bioassays. There were some for workers that kept showing up on safe work permits, and we would find their names

in documentation. Again, there were not a lot of workers that went out there and worked in this location that was only open a couple days a week.

The SC&A, or as Joe mentioned, it's really difficult to distinguish which ones, which workers were at the Burial Ground versus at CFA. CFA had responsibilities at the burial ground, the ARA-I Hot Cell and a number of other areas. Just because it was not a true facility, it was difficult to identify them, although we think we have a decent handle on the primary people that were working out at the burial ground during this time.

The issue of poly liners was brought up earlier. We had suspected that poly liners were used, but we really got these confirmed when we interviewed some of the former workers associated with the Early Waste Retrieval Project that occurred in 1976 and 1978. This was very highly contaminated work that was performed, and there are interviewees which indicated that the tops would pop off during these dumpings.

There were also others that indicated that they never observed it. Doesn't mean it didn't happen, but the frequency, or the occurrence, of these is, it would be hard to speculate based on the interviewee information that they provided. Next slide, John.

The next finding was 1(b). It says, with the exception of Rocky Flats waste, mixed fission products were considered petroleum radionuclides. SC&A had indicated that it's not clear whether a suitable source term can be derived for what radionuclides workers may have been exposed to during specific waste shipments, and whether such exposures can be bounded by existing NIOSH methods. Next slide.

As I mentioned earlier, waste shipments were surveyed leaving the site of origin, and also at the burial ground. Also, in 1965, the Interstate Commerce Commission was responsible for regulating transport of radioactive materials, and they had a limit of 500 dpm per hundred square

centimeters of alpha.

In the response paper there are some small calculations that are made based off of resuspension factors, and also some ingestion dose conversion factors, which indicate even the 500 dpm alpha, we're looking at doses less than one milirem CEDE. This is the committed effective dose, internal dose, for 50 years.

There are some examples of radiological data that are came with the required forms for each disposal. Again, examples of that are in the response paper that we wrote. I keep referring back to it. There are, I think there's 68 or 70 screen shots from documents, excerpts from documents, and photos, that try to provide first-hand responses to some of these concerns that are direct from INL documentation.

As was common practice out at INL, when there were non-routine radiological conditions, INL would perform special monitoring. So this was not just at the Burial Grounds. This was implemented in a number of different places.

When they did that, radionuclides involved would be identified, again, CFA, very close to burial ground, those analyses can be performed there. Then they would request special bioassay if deemed necessary.

As previously mentioned, there are some co-exposure models that are being developed for INL. There are a total of seven of them, including one for beta-gamma contamination, and one for plutonium-239. Next slide.

As Joe mentioned, one of the things that was kind of new with the response paper was taking a look at the bioassay data from the 18 workers who participated in the exhumation work in the 1970s, to provide a bounding estimate. After the SEC-00219 evaluation was completed, we were a little bit concerned about the increased exposure potential at the Burial Ground, because again, in November of 1969 they had their first waste retrieval, and there were a lot of

other things getting ready to happen at the Burial Ground with regards to new regulations and how waste was handled at the Burial Grounds.

We took a look at some of these waste retrieval tests in the 1970s. This would be the solid waste retrieval test which occurred in '71, the initial drum retrieval, which I believe was '74 to '78, and then the early waste retrieval from '76 to '78.

The early waste retrieval was the one that was done in Pit 2, had waste drums that were in very poor condition, and represented the highest exposure potential based on the contamination levels that were encountered. I do recall that from the report on the early waste retrieval project, it stated that about two million counts per minute alpha was frequently encountered during that work.

Again, they did have a plastic suit and other protective measures in place, but that's a lot of contamination. They concluded that the available equipment and established safety and operating procedures were effective in preventing personnel exposures.

So, again, we think that using these 18 workers would be bounding for the 1952 to 1970 period, where it's literally just disposal of waste where you're digging trenches and pits, putting waste in it and covering it with soil. Next slide, John.

The last of the Position 1 findings had to do with the workplace indicators. Again, this was kind of the paucity, if you will, of special bioassay at the Burial Ground, and the limited use and unreliability of available alpha monitoring instruments. Next slide.

Getting back to this special bioassay issue, there are examples in the response paper of special bioassay for workers that were assigned out of CFA that were routinely working at the Burial Ground. It just does not say, look for facility Burial Ground. It says CFA. So we do have, again, a list of names that we've complied while reviewing lots of documents.

One of the things that we did in reviewing of the documents on hand was, we took a look at the Central Facility Area health physics monthly reports. These were put together every month, and these are the ones for Central Facilities Area.

We have a section in there on the Burial Ground, which included off-site and onsite waste disposals, and we've got about 58 percent of the monthly reports for the time period between 1952 and 1970. So we've got roughly 130 of these things. Table 1 of the response paper has got a complete accountability for which ones we have and do not have.

We looked at those and really found almost nothing regarding contamination events being reported in the CFA monthly health physics reports. It is our assertion that if contamination events had been commonplace, especially during the drum dumping, it's highly unlikely that this would have persisted over almost a seven-year period. We think special bioassay would be much more easy to identify. There's just not much, and there's really very few indications in the monthly reports about this, as well. Next slide.

This is an example of a whole body count on the right, about how it's difficult to identify a Burial Ground worker. You'll see, in a red box there is a craft or profession and it says, yardmen. As we've described in previous meetings, these were basically laborers that were farmed out to different locations on site to perform labor.

They were extensively used out at the Burial Ground, and at the bottom of that red box you'll see that the work area is listed as CFA. That's about as close as you're going to get to identifying somebody as a Burial Ground worker. There were certain occupational titles which were very commonplace out at the Burial Ground, with the yardman being one of them. Okay, John, next slide.

That's the end of Position 1. The finding for Position 2, in the evaluation report we had determined that

we thought internal exposures at the Burial Ground were directly related to the materials being disposed of in the ground. Up until that initial drum retrieval in November of 1969, that the potential was virtually all from mixed fission products that was being buried at INL, and any of the off-site stuff, it was primarily plutonium from the Rocky Flats plant.

You'll see the SC&A response down at the bottom there. We discussed this before. I will not read that to you. Next slide, John.

So, our response here again is we propose that we take the bioassay data from these 18 workers that we identified during this highly-contaminated exhumation work in the 1970s, primarily the early waste retrieval work. We identified these when we were looking at whether we needed to do an 83.14 Evaluation Report for the Burial Ground in the 1970s.

We believe that the bioassay data provided the bounding estimate, as we, again, think that there was a much higher exposure potential doing that type of work versus waste emplacement.

OTIB-60 allows for the application of co-exposure data. Again, I mentioned a number of co-exposure models are being developed. We hope to have the OTIB for the models finished up by the end of this calendar year, so good progress is being made on a very difficult and technical development of these co-exposure models.

We have not taken a look yet at the SC&A concern over the use of cesium-137 and strontium-90 as indicator radionuclides. I did want to mention that.

The last preliminary finding, our last position, we indicated that we thought the radiological monitoring program at the Burial Ground was quite good. It included, basically, management by the health physicists, safe work permits for all waste disposals, personnel surveys were completed at the end of work, air monitoring was performed, and decontamination was performed, at CPP if needed.

I failed to mention at the beginning of this, but one of the things that INL did before start-up of radiological operations is, they went to other sites that had some experience with operation times, to basically pick their brains and to bring back good ideas, talk to them about what worked and what didn't work.

And so, they had that, the experience of others to lean on when they were setting up their rad protection programs at the site.

SC&A, again, the word there is checkered with the rad program at the Burial Ground, and doesn't believe that we should be able to claim that it precluded any unmonitored plutonium uptakes up to 1970.

The defense-in-depth that we have pushed forth is not evident, based on their review. I think Joe mentioned that we seem to have opposing views of the same information, so I think that's a very fair assessment.

Other concerns that were stated by SC&A, they were, again, late in this time period of evaluation. I think that assessment was actually in '71. They were concerned about the conflicted role of the HP at the Burial Ground. I can understand that at that particular time.

Regarding lack of management support for the Burial Ground, again, it just is not evident in the documentation. They do mention funding for contamination detection equipment.

What I want to do now is just kind of go over some of these changes that were occurring in the 1969-1979 time period, because they really weigh heavily on what was going on at the Burial Ground. This was a real time of transition for the area, or location, I should say, wasn't even an area by then.

So, just going through the little dashed items up under the first sentence up there, the reorganization

of the Burial Ground was not really due to poor radiological controls. The facility was transitioning away from these simple, low-risk burials to above-ground TRU storage, waste retrievals, and other operations as well.

In fact, to this day, those waste retrievals and other operations are ongoing. If you take an area, if you look up an aerial view of the radioactive waste management complex, the RWMC, which the Burial Ground is known as now, it is stunning, the transformation between the photos that I showed you at the beginning of this presentation in 1970, and what it looks like now. It's completely different.

In May of 1969 there was a fire at Rocky Flats, which dramatically increased the waste shipments to the Burial Ground. Idaho Senator Frank Church got involved in that. That became a real hot potato for what to do with this waste. They did not want it just to keep coming into the state.

The other flood occurred in 1969, as I mentioned previously. The first federal environmental legislation was passed in '69 as well, the National Environmental Policy Act. In addition to that, the AEC wanted to develop some long-range policy standards and criteria management for AEC waste, so you can see there are a number of factors that are playing into going from a fairly simple disposal operation into something much more complex. Next slide.

We don't believe that Burial Ground was a low-priority by INL management. We did interview the Burial Ground [identifying information redacted] during one of our interviews, and that did not come across when speaking to him.

Speaking of interviews, I think the suggestion that we go back and take a look at all of the interviews that were performed, and there were a number of these, that they go back and be looked at in toto is an excellent idea. Take a look at all of the interviews. Some of them will conflict, and just take a look at

what the preponderance of the opinions were on operation of the Burial Ground.

Again, it is our belief that the burial operations were low-risk activities, and the later waste retrieval activities were a little bit more involved and represented in increased exposure potential. Next slide.

This was the preliminary conclusion that was provided for the Burial Ground from the SEC-219 evaluation report. Basically, that the defense-in-depth approach and available internal dose data to the known radioactive source term, the term there says, fall short, given a review of the available documentation and interviews. Next slide.

Again, we did an extensive review of a number of documents. I've mentioned the CFA monthly reports. We also looked at the CFA HP logbooks, which would contain information about the Burial Ground operations and also log sheets, and did not see contamination as being a common occurrence at the Burial Ground.

We believe that the Burial Ground was properly managed, and that most of the interviewees were favorable about the (telephonic interference). Again, there were some dissenting opinions, but if you take a look at it you can come to your own conclusion.

One of the things that surprised us when we were doing the 83.14 determination of the 1970s was that a couple of workers indicated that the Burial Ground was actually a preferred area to work at. That caught us by surprise. We did not think that that would be the case, but yet it was stated. Next slide.

Listed at the bottom of this slide here are some of these occupations that I mentioned earlier that were typically associated with Burial Ground work. In particular, if you look at labor or yardman, equipment operator, and heavy equipment operator, we found that these three, we were told that they were basically the same occupation ladders. That

somebody came in as a laborer or yardman, got promoted up to an equipment operator, then became a heavy equipment operator.

That's why those three are often seen with the Burial Ground work. Obviously because those, the labor and the equipment, are needed for the types of work that are being done out there. Then we also have truck drivers, and HPs as would be expected as well. Next slide.

There was no routine bioassay program at the RWMC until 1978. Special bioassay was described as necessary per professional judgement by the health physics, and the Burial Ground workers from '52 to 1970 would have dose contributions from mixed fission products, using these co-exposure models that are being developed as well. Last slide.

Again, I reiterate that for the actinide dose reconstruction, we propose using the bioassay data for those 18 workers that participated in this highly contaminated waste retrieval work in the 1970s. We believe that this will provide a bounding estimate.

Lastly, the Tech Basis Manual for internal dose for INL and ANL-West, it'll be revised when we incorporate these changes and get these co-exposure models finished.

John, that's all I have.

Mr. Cardarelli: And that's the end of this presentation, Dr. Roberts.

Mr. Findley: There was mention about Bob Barton following this?

Mr. Cardarelli: Oh, yeah.

Dr. Roberts: Yes. I wanted to see if the Work Group Members had any questions or comments about this presentation.

Member Beach: Yeah. Do we want to take a break first, though? We've been at this for a couple of

hours. Just a question.

Dr. Roberts: Sure, yes. But I did just want to entertain any questions, and then after the break we can start with a new presentation, if that's okay?

Member Beach: Well, I have a couple of questions. This is Josie.

Dr. Roberts: Go right ahead.

Member Beach: Okay. If you go back to the Slide 16, the original contract, your answer was, or to the haphazard suggestion?

Mr. Findley: Right. This was the excerpt out of the Burial Ground operations memo?

Member Beach: Yeah. I was just wondering what the actual practice was. This was original management responding to the new contracts, right?

Mr. Findley: Correct.

Member Beach: And I don't know, from my experience they don't usually or necessarily carry over to later contracts.

Mr. Findley: Right. We could not find anything in the SRDB related to management expectations prior to 1961, other than the procedures that were in place. Those went back to, I believe, 1955.

Member Beach: Then if you look at slide 17, talking about the procedures, as an operator for 32 years out at Hanford, I know that the procedures didn't always equal the practices. I guess, for that first bullet, monitoring practices, you say that other INL facilities were being used.

Those were so different. I mean, we're talking reactors, CPT, they were all different. How do you know that this, how do you know those training practices went over into the Burial Ground?

Mr. Findley: Well, they had these standard operating

practices, I think is what they called them, and in them they would list, the one that I mentioned by example was the whole body count schedule. They would have a whole body count scheduled, for example, for CPT or for TRA or for Test Area North, and there was one for CFA as well. The Burial Ground was not listed on there. The extension of that logic is that they did not think the exposure potential was warranted by routine bioassay.

Member Beach: And the next bullet kind of goes into that, the safe work permits, shipping records, how do we know that they were adequate and implemented? I guess that's the key, is where's the proof of the implementation of those documents?

Mr. Findley: I think the proof is in, basically, the lack of contamination events that we were able to find, looking at monthly reports and logs and bioassay records. Just of, they just aren't there.

Dr. Taulbee: Josie, this is Tim. I just want to chime in a little bit here. If you look at how the rate rad monitoring was done at the other facilities, specifically talking about the air sampling, occasionally, on an as-needed basis. Do those seem different between that type of operation and what they were doing at the Burial Ground?

You've got a new facility, whatever was brought in the Rocky Flats drums to be dumped, they set up air monitoring for that. They monitored those people, they did contamination surveys of the drums coming in, they dumped the drums and took air samples during it, and then after everything was done they monitored the people going out.

They were all wearing PPE at those times, when they were dumping those Rocky Flats type of drums. So, that's what we don't see any difference with.

Member Beach: Yes, Tim, and I see that on slide 19, but there's only one air monitoring in that photo. In this particular picture, it depicts how they're haphazardly dumping those drums, with only one air

monitor, not really in the area where the workers are.

And then we've also seen pictures where they're dumping or moving around in the drums with no protection, no whites, they're just in their street clothes or blue coveralls.

Dr. Taulbee: Okay. I'd like to see some of those pictures, because we do have a tremendous number of pictures of people being monitored as they're at the Burial Ground, and the people doing the work were actually wearing PPE, wearing the anti-contamination clothing. There are people in street clothes, but they're not doing any of the work. They're more observing, from the pictures that I have seen, from that standpoint.

I think the key to this is back to James' request was, and what Joe mentioned and what Mitch mentioned here and that's to go back to those interviews and look at what those workers were describing at the area and how things were being conducted at the facilities. I think that if you go through all of that then I think it will paint a more complete picture.

Member Beach: I almost wonder if it raises to the level of actually pulling all those interview notes out, since they have been so heavily discussed, and actually having some kind of a memo or paper written on them, to bring them all into one spot. I mean, I know I can go into SRDB quite easily, and look at all those documents, but I'm not sure if all the Work Group Members are so inclined. It might be something to think about, Phil.

Chair Schofield: Yeah, I agree. I think that would be a good idea, and I had a question, too. A lot of these drums are coming in. Did they wear TLDs? What was their exposure? Some of these drums are going to be obviously very hot internally, throwing off a lot. Others are going to be very mild and basically there's almost no exposure to the skin of the drum.

Were these documented? Did they wear dosimeter pins on their wrists? Were they using dosimeter pins

or using TLDs? What was their monitoring?

Dr. Taulbee: Phil, this is Tim to answer that. I can take it. Everybody going into the Burial Ground had to wear a film badge dosimeter or a TLD. In this particular time period it was primarily film badges.

So, everybody coming in, if they were a temporary worker then they were badged and given a film badge dosimeter to come into the facility. So all of the external monitoring was conducted there.

(Simultaneous speaking.)

Chair Schofield: Okay. Just one other question while I'm still thinking about it. On their TLDs, I know it's been practiced at some facilities, basically when they read the TLDs they're really looking maybe for neutron exposure or gamma exposure, and they're not really paying a lot of attention to the other exposure. Generally, when their badges were read, did they read them straight across the board? You know, we're looking both at your gamma exposure and your neutron exposure?

Chair Schofield: I know they were looking at the gamma exposure and the beta exposure. I'm not sure of the neutron exposure, but I can't imagine that it would be significant. And the reason that I say that if you look at that picture of the drums being dumped, people are standing quite a distance away from there and there just isn't going to be much neutron or gamma exposure from that.

It's more when you're directly handling the drums, if they were placing them in individual locations, that was when they were receiving more of the external dose in the earlier years, and at that time there's very little internal exposure potential. But I'm not sure of the neutron monitoring in those very early years. But we can get back to you on that.

Chair Schofield: Okay, thanks.

Member Beach: This is Josie again, Tim. So isn't the

issue internal, and there are no bioassays? There's sporadic air sampling. You also have uncertain source terms. And I know you're saying, according to this picture, yes. They are standing a bit away, but they're not always that far away. This picture doesn't depict everything that happened at the Burial Ground. We've seen pictures where they're much closer to the waste.

Dr. Taulbee: There are several questions there.

Member Beach: Yes, sorry.

Dr. Taulbee: Could you go back and repeat the first one, because I had the answer ready for that one.

Member Beach: The issue is internal, and there's no bioassays with the Burial Ground.

Dr. Taulbee: There are bioassays. There's a special bioassay that we can't explicitly put to a person in the Burial Ground. We find special bioassay for people who worked at the Central Facilities Area, and Mitch showed an example of that in his presentation. If you look carefully at the one slide that shows a whole body count request, it's a special bioassay for an individual.

We can only tie it to Central Facilities. It could have happened over at the Hot Cells, we don't know, but we have a pool of special bioassays for people at the Central Facilities. Some of those are very, very likely to be from the Burial Ground. We just can't find anything that explicitly says Burial Ground, because that really wasn't a facility. The Central Facility controlled it.

So there is bioassay on a special basis for Burial Ground. There are air samples associated primarily with burial of the Rocky Flats waste, which is the alpha contamination hazard that they were well aware of. So there is the air samples, there is the bioassay.

What we're proposing for dose reconstruction is to

use the bioassay for people who extracted the waste, who were going in and digging up the waste from the initial drum retrieval, from the early waste retrieval projects, and using their bioassay and applying it to people who worked at the Burial Ground. We feel that when they went back in to dig it up, that was a much higher potential for exposure, and that that would be the bounding scenario.

So that what Mitch has been pointing out throughout his presentation. Those early years were a very simple dumping type of operation. You put the drums in, dump them into the pit, and you run over it with a bulldozer, cover it all up with soil using a bulldozer, and there were times when they run over it, and they would compact it further and put more dirt on. That was the operations.

Now, when you go back in and you start digging up those same drums after these floods, there's going to be a higher potential for exposure. And that's the bioassay that we are proposing to use through this entire time period.

Going back to those interviews in total, and looking at what the workers had to say, I think is a great idea. We can compile that information as you are requesting. It's not, I'm not going to summarize any of it, we're going to put it together for you all into one location, so that you have it, you don't have to go searching through the SRDB.

I think when people try to summarize it, you have a tendency to try to put your own opinion into that, and I think you guys reading the original interview summaries that were reviewed by the interviewees that said, I agree with this, is very important for this work.

Member Beach: Okay. A couple of your points. So, there's really no way to officially tie the bioassays to the exposure at the Burial Ground in the earlier years. You have no actual way of tying that, is that correct?

Dr. Taulbee: That is correct.

Member Beach: And then, the 1970s, I guess I question how representative that is, because the way that work was conducted was so different from the way it was conducted in the '50s and '60s, up into the early, or I should say the late '60s when the AEC did their report and found numerous issues with the way work was being conducted at the Burial Ground.

I guess I have questions about the 1970s as being representative to those earlier years.

Dr. Taulbee: I think that's what Bob is going to present next, about that. The one thing that I would say from that standpoint is, there are differences between the different waste retrievals. I believe the initial drum retrieval was very similar from a monitoring standpoint to what you see with the dumping of the drums in the 1968 time frame.

So there's very good similarities between those two. That's something to consider. Anyway, Bob's got his whole presentation to do.

Member Beach: I understand. And so, Tim, NIOSH is going to take on putting all the interview notes in one place. Can you reference all the SRDB numbers in that report also, in case we want to go back and verify some things ourselves?

Dr. Taulbee: Oh, absolutely. Absolutely. In fact, I envision these all being combined into one PDF file. We will pull the SRDB documents out and put them directly into one file for you. It might be two or three volumes, but we'll see.

Member Beach: And I feel like I'm hogging the floor here, but I've got one more comment on slide 32. The last bullet, Mitch said that several interviewees during the 83.14 determination indicated the Burial Ground was an actual preferred area to work. From my experience, I would say that would be true, because there was such little management oversight that it would be a good place to be --

Member Anderson: Left alone.

Member Beach: -- perspective. Was that you, Henry?

Member Anderson: Yes.

Member Beach: I didn't catch what you said.

Member Anderson: Oh, I said, because they were left alone.

Member Beach: Yes, yes.

Member Anderson: There was nobody there, pointing out the things.

Dr. Taulbee: I would only encourage you to read the actual interview and come to your own conclusions with regards to that.

Member Beach: Right, okay.

Dr. Roberts: Okay. Are there any other questions? It's been a while, so I'm thinking we need to go to break for maybe 15 minutes. Would that be sufficient for people?

Member Anderson: I have one short question.

Dr. Roberts: Sure.

Member Anderson: And that is, throughout this we hear that this was considered a low-risk burial, and what I'm wondering is, what's the documentation that it in fact was low risk, continuously? And the assumption is, all the burial pits at that time, for general waste like this, typically were considered low risk, and then when we get to the '70s all of a sudden there's a recognition of the risk being recognized there.

So, it would be nice, I couldn't tell if there were surveys that were done to document that in fact that assumption was correct.

Mr. Findley: Well, the air sampling data that we have from some of these are not showing any significant

contamination. However, as Mitch was pointing out, when they went in and started digging up some of these drums where the drums had breached, and digging out some of that, the contamination levels are incredible, or not incredible, but in the millions of dpm type of range.

So, that's where some of the basis of this comes, but a lot of it comes from just general observing and thinking about what is happening. You've got drums that are surveyed below a certain contamination level that are being dumped into a pit, they go down and they're covered up from that standpoint.

Did some of them rupture at the time? Possibly. In fact, it was likely maybe one or two of them did. The pictures that you look at, though, of the massive amounts of drums being dumped, don't show a huge number of drums being breached from that standpoint. You look at some of the pictures, most of them are intact before they're covered up from that standpoint.

That's why we envisioned that they were considered to be low risk. You go back in and start digging them out, after the floods, after they've been sitting for ten years, after they've been deteriorating, that's when the risk was much higher. That's the bioassaying data, of those workers, is what we're proposing to use.

Member Beach: Tim, weren't most of those workers all in bubble suits?

Dr. Taulbee: For the early waste retrieval they were, but for the initial drum retrieval, no, they were not. And Bob's got some pictures showing that in his presentation. But I think we should take a break now and then get back to Bob's presentation.

Dr. Roberts: Why don't we do that? And since it's about 1:20, why don't we come back at about 1:40 and resume?

(Whereupon, the above-entitled matter went off the

record at 1:19 p.m. and resumed at 1:41 p.m.)

Dr. Roberts: Okay, great. I think that may be just about everybody. And I see that Bob has his presentation up. So let's just continue along.

Mr. Barton: Great. Thank you, Dr. Roberts. And good afternoon, everybody. Or, I guess, Josie, it may be still good morning. But that conversation that was going on just before the break is actually a pretty good lead in to what I'm going to be briefly presenting here.

As you can see, for those of you on Skype, I do have a slide up here, which is a strange sort of an outline of what I'm going to be talking about. This is actually a new 508 requirement for us, and it looks a little strange.

But as you can see, I only have five slides and two of them are photographs. So hopefully this will go quickly so we can get right back into that conversation.

So anyway, as was discussed during the previous NIOSH presentation, the proposed method for reconstructing transuranic, doses of the transuranic material, and we're really talking about that Rocky Flats material in the pre-1970 era, is to use bioassay for 18 workers who were involved in the drum retrieval operations that were occurring in the 70s.

So there were 18 workers, and we have both urinalysis and fecal results for those 18. There were samples in the late 70s, the '77, '78 time frame. And, again, we're mostly associated with those drum retrieval operations, which we'll see in a second.

So this next slide, and this is Table 1 in SC&A's report. And I'm on Slide 10 because I was following on the online presentations.

This is basically just a table that shows the makeup of these 18 workers. And you can see we have basically four job categories. We have health physics,

equipment operator, labor, supervisor.

And, actually, as Mitch mentioned in his presentation, it's not surprising that there were so many equipment operators because that was really the sort of typical career track. You would start out as a yard man, be promoted to a laborer, then promoted to equipment operator and then eventually heavy equipment operator, which I would assume is included in both. Both of those are included in the equipment operator category here.

So these job titles make sense. And if you look at the column headings, we have the initial drum recovery and early waste retrieval operations. Those are the drum retrieval operations that we're talking about.

And then you have a few workers who were just classified, again, by the site as just general operations at the RWMC.

If you look along the bottom line there you can see it's split right into thirds between the initial drum recovery, or IDR, the early waste retrieval, or EWR, and then the general operations.

So our next slide, and this is where we want to kind of talk about what was going on in those drum retrieval operations. And the real issue from SC&A's standpoint is how relatable are the exposures that those workers experienced during these retrieval operations, how relatable and really the buzz word in this program is how representative are those exposures to what might have been experienced prior to these retrieval operations for that period we're trying to reconstruct.

What we have here is a photograph of the inside of what's known as the operating area containment structure. This is part of the early waste retrieval operations. And, you know, one thing I think, and even Tim mentioned, one thing that's great about Idaho is they photographed a lot of stuff. So there is a lot of great photographs like this one to really get an idea of what was going on.

So you see this operating area containment, you see everybody is in bubble suits. You can see the supply air hoses. I believe that might be a continuous air monitor possibly in the right corner. As you can see, they're digging into the ground, again, retrieving some of these drums that were really in pretty tough shape.

Now this operating area, I guess, its confinement structure, it was actually this modular metal building that was within what was known as an air support weather shield. It's basically a big inflatable building that covered over the top of this metal building.

There are actually three different, I guess you would call them changing rooms just to get in and out of this metal structure where the digging is actually taking place, three different rooms to come in and three different rooms to basically dress out to leave the structure. So there was a high level of control over contamination going in and out of this.

We know there were at least 10 continuous air monitors that were associated specifically with this early waste retrieval. Six of them were actually inside this metal building. You had two more on the outside of the building in case any contamination escaped. And also two that were on the HEPA filters that were filtering the air coming out of that building.

So as you can see there's a very high level of sophistication and contamination control and radiation protection that was going on with this operation. And, again, that's the EWR.

The other major drum retrieval operation that these 18 workers, again, these 18 workers had been proposed to use for dose reconstruction, here's two photographs from the IDR, the initial drum retrieval.

The top photograph you can see what I assume would be a health physics tech. He's monitoring the outside of one of the drums that has been retrieved. He's in full anti-Cs. It looks like it was taped around the hands and feet. And he has a half mask respirator

strapped around his neck.

And what we learned from the interviews is they didn't actually have to wear those full-time, but basically because they had so many monitoring devices and instrumentation around, if there was any indication of a breach of those drums or any airborne contamination, those alarms went off, the half mask went on and a lot of times they would even evacuate. And that would even be for alarms that might go off just because of elevated radon or thoron in the area.

So, again, a very high level of sophistication with the health protection program during these retrieval operations.

The bottom half of that photo shows again another tech. It looks like he's working on one of those continuous air monitors, which is placed in the air of one of the retrieval pits.

So, again, the question is did the workers, who were involved in this type of activity, is the exposure potential that they experienced relatable or representative of what could have been experienced prior to this 70s operation when the burial ground really became the radioactive waste management complex.

So that's really the gist of our main concern here. And for those of you on the phone and maybe not able to see the presentation, what I have here is just a quote that pretty much summarizes NIOSH's position on the subject, which is that they would consider it bounding because these burial activities would have had a much lower potential for contamination and therefore a lower potential for internal exposure than the unearthing activities that took place.

And we certainly agree that the contamination levels and the potential for airborne activity are certainly bounding. When you are pulling these drums up, some of them are ruptured, especially in that EWR building, where they're all in bubble suits. But the

point is, they were in bubble suits.

So our question is while the nature of the environment, radiologically speaking, is definitely more hazardous, is the potential for actual uptake of these contaminants also bounding?

And that's really the question that's sort of a balancing act. Yes, we totally agree there are elevated more hazardous conditions during these 70s operations but also the oversight, the radiological control, the interest by management, things such as that, was also quite different.

One other thing I would point out about this, this topic came up -- Gen, you pointed it out earlier -- while the interviews that occurred were for the time period prior to this that we're talking about reconstructing were often contradictory.

You had differing accounts of what contamination control measures there were and health physics oversight. As many of you know, because I remember you were at the table for these interviews, during this period of drum retrieval, the interviews were remarkably consistent.

There was a small dedicated workforce that was highly trained to do this work. The work was performed. They all said it was a high level focus on safety.

As I said, there was a lot of interest at the time with these projects. I believe a few interviewees mentioned there was an observation window in which, you know, management would come through or even some politicians might come through just to witness what was going on with the safety measures that were in place.

They also mentioned that during this time of the drum retrieval, there was a high reliance on the health physics staff, and there was a high level of confidence that they were being protected there.

And also that health physics coverage was almost universally said to be continuous. They were always there. They were always monitoring.

And so, again, the issue for SC&A, and this is my second bullet here, although the contamination certainly would be considered bounding for these retrieval operations, we're concerned is it really relatable considering differing levels of actual health physics oversight, contamination control and protection measures?

Now I have one more slide here. And this is -- I put it in here because it was in our report. So I sort of felt obligated to talk about it. Right now I kind of wish I didn't.

But if we decide that the exposures during these retrieval operations are relatable, that they can be considered representative or bounding of that earlier period, we're just pointing out a couple things about how that data for the 18 was actually used to eventually model an intake rate and how the dates you choose to start and end the model intake period can have a significant effect on what that intake rate is.

Now it may be that the calculation shown by NIOSH when they originally proposed the method of using the 18 workers as a co-exposure model was simply an example. But in any case, this is in our report so I wanted to mention it. But I would consider this largely what we say is a Site Profile type issue rather than an SEC discussion.

So, again, to sum it up, our main concern is can we really use data from these workers who were monitored in the late 70s under much different conditions?

Both radiologically, they were more dangerous conditions. But from a safety aspect, they were much more stringent. And so how representative is the data for these 18 workers in the guise of using it for burial ground workers prior to this when it was a

much different area?

So that's really all the slides I have. I'd love to entertain any questions.

Member Beach: This is Josie. I do have a question on your earlier, well, your first or your second slide, if that's okay.

Mr. Barton: Sure, Josie. Do you know what number slide that was?

Member Beach: No. Because on mine it doesn't show the numbers. It was the very first one you presented. And I don't really the slide up.

But my question is, and I don't know if you can answer this or Tim or a combination. I'm curious, and it struck me when I read this report, is how representative are the 18 workers?

If you look at the list, you have health physics, equipment operators, heavy on the equipment operators, very light on laborers. And to my knowledge and experience with these types of operations, you're going to have a lot of labor force working inside the entry tents, exit tents, cleaning up waste. And so I guess it's light on the laborers.

How representative would these monitored workers really be?

Mr. Barton: Well, I can only -- go ahead, Tim.

Dr. Taulbee: No, go ahead, Bob.

Mr. Barton: I was going to say I guess I can only speculate that they were chosen because it was such a, I guess, for the burial ground a very high level operation. And as I mentioned, the equipment operators were sort of more senior people.

You would start -- again, the typical career track that we heard from several interviewees was that you start out as a yard man and then you became laborer and then you became an equipment operator.

So one possibility, and this is sheer speculation, is that they had equipment operators doing more labor-like tasks simply because they had more experience, and they were really the more senior employees. That is pure speculation. I don't have any information to that effect.

Dr. Taulbee: This is Tim. That is actually along the same lines as I recall during the interviews. It goes along that career path, if you will.

And they also indicated that the equipment operators did a lot of the hands-on work directly related to the running of what I consider heavy equipment. But they had a different definition of heavy equipment versus equipment operator type of scenario.

So there's a blending going on there and then the actual job titles themselves. They're going to be changing as people were promoted up.

So, you know, in essence you can really lump those two in together in my opinion. But, again, that's just my opinion from what I recall with the interviews. But, again, if you read back through the interviews, I think you will get a better feel for that.

Member Anderson: Do we have an idea of how many total workers were involved in these kind of -- the burial or retrieval process? I mean, is the 18 representative of how many workers?

Dr. Taulbee: Yes. The 18 is representative of the workers. As I recall, Mitch, and correct me if I'm wrong here, but the total number of people monitored at the burial grounds in this time period was around 30 to 40? Is that correct?

Mr. Barton: That is correct, Tim.

Dr. Taulbee: And a large number of them were over at the Transuranic Storage Area. Inside these two operations that were going on simultaneously, the IDR and the EWR, the initial drum retrieval and the early waste retrieval, they were small dedicated

crews that were doing this. So these are very representative, at least in my opinion, of the workers in that time period at that area.

Mr. Barton: I guess I would just add to that, you know, in the documentation that identified these 18, it was a targeted sampling for the purposes of determining not only had any intake occurred, but to also establish baseline levels of lung burdens or body burdens that could be used to affirm later intake should they occur but also to look retrospectively but also to establish a baseline.

So they did make an attempt to really target the folks that they felt at the time would be most at risk for these retrieval operations.

Member Anderson: Okay.

Dr. Taulbee: Could I ask you, Bob, to go to Slide 12? And this is something I'd like to point out where we're in a bit of disagreement here with SC&A. And, again, I would encourage everybody to go back and to read the interviews when we send them out to everyone.

But the lower picture here, where the individual is working on the continuous air monitor, I want to point out a few things when he did his presentation.

But the air sampler is positioned there near the edge of where the pit has been dug. When you look, you can see the top of the excavator down in the pit. There would be a worker down in there. This is retrieving the drums from this area.

And you will notice the worker who is working on the cam there. He's wearing an anti-Cs. He's wearing a hard hat, he's wearing shoe covers, as pointed out.

And if you recall back to Mitch's presentation on Slide 19, which is the dumping of those drums going into the pit where they're standing there at the edge of the pit and the air sampler is there again at the edge of the pit. They're all wearing PPE coveralls with shoe covers. They're all wearing hard hats.

You don't see a big difference here in the monitoring. Yes, the air sampler is much more sophisticated here. It's a cam instead of a filter paper, but the same general purpose is there, of monitoring the air that would be coming up out of the pit.

In this particular case, there's somebody down in the pit. In the other examples that we were looking at, there aren't, I guess, in a sense, other people milling around.

Here we've dug into contaminated soil where drums have been sitting for 10 to 15 years. And we've retrieved some of those drums and they're continuing to do that. So this is why we feel this is the more hazardous work here. And the monitoring isn't that different from that standpoint.

Yes, the instrumentation is more sophisticated. But the basic premise of monitoring the air and protecting the workers through PPE to keep contamination off of them is the same.

In this particular picture, we're using the bioassay from these workers here working down there in the pit, recovering these drums that have been (telephonic interference) as the basis for the dose reconstruction for that earlier time period where they were just dumping it.

Chair Schofield: A quick question. Did they ever check the levels of radon when they were down in the trenches?

Dr. Taulbee: I don't believe so. We do have evidence of them checking the radon levels on their air samples and letting them decay off when they were doing some of the smears. But, you know, if you're wearing a plastic hard hat, you're going to get radon on one. And so, you know, you've got to let them put tape on.

So there was some of that reference within SC&A's report of the individual talking about the conflicts of operations and health physics team, that conflict of

interest. There's a paragraph there that discusses that. And the example given is actually monitoring for radon in that sense, of letting it decay off. But the actual (telephonic interference), especially when you're talking about just to be fluid in the --

Dr. Roberts: I can hear some interference. Excuse me. Is everyone on mute, please? Thank you.

Dr. Taulbee: And, Mitch, please jump in if you know of any additional data on that.

Mr. Findley: No. I believe your response was correct, Tim. Mr. Schofield, I don't recall ever seeing any air results where they were specifically monitoring for thoron. It was always typically this natural decay products showing up on the air filters and then letting them decay off so they could, you know, measure for the occupational radionuclides of interest.

Chair Schofield: Okay. That does bother me a little bit. Okay. Thanks.

Dr. Taulbee: One thing to keep in mind, Phil, is that when you think of the operations in those earlier years up to 1970, it's dumping waste into open pits. There aren't any buildings or anything along those lines. So this is right off on the plains of Idaho type of scenario.

And there is early measurements before the waste was put there of the natural uranium and thorium in the soils.

Member Beach: This is Josie --

(Simultaneous speaking.)

Chair Schofield: Tim, did I understand you to say that the 18 workers, that data you're using, were all down in the retrieval pit here?

Dr. Taulbee: They would have been moving in and out around there. They would have been down in the pits. We've got pictures of that, up here on the top. There's one guy who's driving a forklift, the

equipment operator. So they would have been moving all around.

And we're using their bioassay, not the air samples. We're using their bioassay.

Chair Schofield: Do you have photos of the guys who actually had the monitoring done?

Dr. Taulbee: Yes.

Member Beach: So can I point something out? This is Josie. I went back and looked at SC&A's earlier report, April 2017. If you look back at their Appendix 2, they've got several burial ground photos in that report that are pretty interesting as far as being able to see the actual operations of the earlier years, not what Tim is talking about now. But it might be helpful for folks to look at those again.

That's the one, Tim, where I was saying there was a gentleman working around a drum with just street clothes on. And it appears that he's leaning over a drum with the lid popped off. And I think it might be a camera in his hand. He may or may not have a mask on.

It's hard to really tell. But you can see damaged drums in this picture. And he's right on top of them actually. So, anyway, I just wanted to point that out.

Dr. Taulbee: Okay. We'll take a look at that, Josie.

Dr. Roberts: Okay. Great. Any more questions or discussion? Okay. Well, hearing none, I'm assuming we can go ahead and move on to Number 2 on the agenda.

But just to kind of, you know, recap what we need to kind of move forward on some of the differences in perspectives articulated by NIOSH and SC&A, it sounds like DCAS is going to pull the interviews out of the database and kind of compile them with some reference numbers, SRDB reference numbers in the report in a PDF file to allow for the Working Group

Members to take a look at the interviews. It sounds like that is one deliverable to kind of pave the way forward.

SEC-00219/224: Evaluation of EBR-II and BORAX-IV for ORAUT-OTIB-0054 Applicability

Dr. Roberts: So let's go ahead and move to the second point on the agenda, SEC 219/224 evaluation of EBR-II and BORAX-IV for ORAUT-OTIB 54 applicability starting out with an SC&A presentation by Steve Ostrow.

SC&A Presentation

Dr. Ostrow: Hi, everyone. It's Steve Ostrow. Let me see if I can get the slides up here. Okay. That seemed to work. Can everyone see the first slide?

Chair Schofield: Yes.

Dr. Ostrow: Okay. Great.

Dr. Roberts: Yes.

Dr. Ostrow: Here we go. Amazing work. All right. So this is really -- my presentation is fairly short. And it's really a prelude to the NIOSH companion presentation.

We've been looking at reactor characterization for several years now. And I'm going to go into a little bit about the history. And then NIOSH will discuss afterwards their current paper, ORAUT-RPRT-0099, which they just released recently.

So just a little background that OTIB-54, Fission and Activation Product Assignment for Internal Dose-Related Gross Beta and Gamma Analysis, is one of the primary tools that NIOSH uses for dose reconstruction and in particular for INL.

But we had reviewed the OTIB separately from this when we were looking at procedures and found this methodology sound in general. So we have no quarrel with OTIB-54.

The investigation that we're doing specifically for INL was whether this methodology, whether the OTIB envelope, the important conditions of the INL and ANL-West reactors, and we started off with a series of reports from 2015 and 2016, looking into this.

And as you know, INL had a lot of reactors, 52 of them. And since it's a test site, a reactor test site, a lot of the reactors are very unusual, very different from any commercial reactors. So it was a question.

And obviously NIOSH couldn't look into all 52 reactors in great detail to see if the OTIB envelopes them. So after some meetings and papers and so forth, we prioritized the reactors into three classes, high, medium and low categories. And these categories were based on technical issues about what sort of reactors they were, how they were operated and what sort of cores they had and things like that.

And we also factored in the potential of the reactors actually exposing the people. Because if you had some reactor that had a very unusual core configuration but there was hardly any people around, that would be a low priority. So you had other reactors where there were a lot of people around. So that's how it's painted. And there was a lot of discussion between NIOSH, SC&A, and the Work Group.

A little more background, the TIB-54, as I started saying before, the TIB-54 determines internal go to when only gross data or gross gamma measurements are available. And it defines vision and activation product intake so different radioisotopes that are directly tied to an indicator radionuclide with the strontium-90 and cesium-137.

This is a very technical OTIB. I've looked at lots of them. And this one is really off the chart for complexity. And the OTIB generated using outputs from the ORIGEN code primarily, which is part of the SCALE system of reactor codes, nine different representative cases based on four different reactors, which are intended to envelope the range of reactor

nuclide fuel types in operating scenarios.

The ORIGEN code basically does build-up and decay of radioactive material if you give it an initial fuel input and operating history to generate inventory, radioactive inventory.

These are the archetype reactors that are modeled in the OTIB. And to apply the OTIB, which over the years has gotten a little bit better because there's a workbook that goes with the OTIB right now, there's four different types.

So if you have a given reactor in a given situation, and you want to use the OTIB, you have to pick one of the reactor types and see which one envelopes your particular situation the best. That's the simple way it's done.

After several back and forths between us and NIOSH doing the White Paper and discussion, and finally at the May 16 Work Group meeting, the NIOSH, SC&A, and the Work Group agreed on the course of action, so all the possible scenarios and so forth, that these are a list of different reactor that NIOSH is going to analyze. These are the action items out of this.

So this is a 2017 meeting. And about three years later now, NIOSH produced this document that NIOSH is going to be discussing after this the BORAX-IV reactor core and the EBR-II reactor. And we agreed with NIOSH on certain limiting conditions -- I'm not going into it here -- that sort of maximize potential for exposure for personnel.

So that's where we are. The SC&A hasn't had a chance to look at NIOSH's ORAUT report that they just came out, the 0099 report, in any detail. I went through it real quickly. A lot of stuff in there to look at.

And we look forward to the opportunity during the presentation and actually reviewing the report and giving our assessment to the Work Group. So I'm finished.

First of all, any questions from any of the participants? Okay. If no questions, I'll turn it over to --

NIOSH Presentation

Dr. Roberts: Yes. But, okay, you were heading where I was heading, which is to turn it over to the next speaker from NIOSH. And the person that will be speaking is Bob Burns.

Mr. Burns: That is me. Good afternoon.

Dr. Roberts: Good afternoon.

Mr. Burns: Can everyone hear me okay?

Chair Schofield: Yes.

Mr. Burns: Okay. Good. And I guess, there is it. Okay. I see the presentation. And John Cardarelli, I'll just -- I'll probably just cue you as best I can as far as when to advance the slides. I'll just use -- I don't know if you can see the slide numbers or not, but we'll figure it out.

Mr. Cardarelli: Yes. Will do, Bob. Thanks.

Mr. Burns: Okay. I'll jump right in here. This presentation is a summary of ORAUT-RPRT-0099, which was an evaluation of the EBR-II and the BORAX-IV reactors versus TIB-54 applicability as Steve just discussed.

So, I guess, Slide Number 2. This is an overview of the presentation. We're going to discuss the objective of RPRT-0099, the reactors that were considered and how those were selected, how those were modeled and the source term generation, the calculation of the fission and activation product content of the fuel lift at end of life or at the end of the ordination period for those reactors.

Use of that source term information for computing organ doses and comparisons of those organ doses with doses predicted or computed by the TIB-54

method using the same bioassay or same unit bioassay or unit intake. Basically the same intake scenario.

John, I think I got ahead of you. I skipped the transition slide there, right. Cool. All right.

So our presentation today is going to summarize RPRT-0099, which, as I said, documents organ dose computed using fission and activation product source terms determined for the EBR-II, the BORAX-IV reactors.

And we calculate those organ doses and compare those with the same doses or from the bioassay model as computed from the TIB-54. And, you know, why do we do that? Why do we want to see what that looks like with respect to this question of applicability of TIB-54 to all these reactors that ran INLs over the years?

So ultimately it was a question of, you know, was TIB-54 sufficiently bounding? So, again, continuing with our purpose here, basically these were -- the slide synopsizes the method where, you know, the manual calculations for the BORAX-IV, the EBR-II source terms and compare those with the results from the TIB-54 tool. Those reconstructors use a software developed specifically to implement TIB-54 given the complexities of those dose calculations.

But since that software tool doesn't encompass or include the BORAX-IV or the EBR-II source term information, those organ doses were calculated manually, if you will, using the spreadsheets and other processing tools that we used to developed TIB-54.

Slide 6, John. Forgive me if I'm jumping ahead of you. Thank you. I'm looking through my hard copy. But the key here, the analytical approach, you know, as far as the comparisons and the organ doses between the two, everything is identical. The only difference is the source term, or the two source terms, the source terms from the EBR-II and the

BORAX-IV, everything else is the same.

John, you can skip the transition slides there, John. Thank you. Just some background refresher information. Steve already covered this so I won't repeat anything.

But TIB-54 was prompted by a need. In the earlier days of the project, we had a number of claims that were backlogged, was the term we used, due to the fact we didn't have a means to assign fission product mixtures from bioassay urinalyses specifically that were done on a gross analyses, that were either gross beta or gross gamma bioassays. So that's what prompted TIB-54 in the first place.

And what it does is for a given gross beta or gross gamma urinalysis it computes what we call an indicator nuclide activity. It tells you for giving gross beta or gross gamma results, the fraction of that that's comprised by the so-called indicator radionuclides, those are simply our reference points of strontium-90 and cesium-137, which is our prominent fission products of isotopes you would expect to see in any bioassay result.

And then it also assigned the rest of the mixture, the so-called associated nuclides, relative to those components, fractions of the indicator radionuclides.

I'm trying to synopsize some of this. Yes, thank you, John. Continuing on, as Steve already presented, the SC&A did some evaluations. Looking at, you know, just the wide gamut of reactors that were built and constructed and researched at INL and ANL-West over the years and just created this report prioritizing those.

And I don't know what's all here. But I'm always asked the question, would TIB-54 envelope with sufficient accuracy these reactors? The rationale for reactor selections, as has been discussed, we modeled the EBR-II and the BORAX-IV of the 50-odd reactors that were constructed at INL.

This is the slide I thought I was on. Forgive me, folks. I'm sorry. Let's go ahead and jump to Slide 12. Okay.

So the EBR-II was selected because it was an unmoderated, sodium-cooled fast reactor, but it used a uranium fuel as opposed to a MOX fuel.

In TIB-54, we considered the FFTF fast reactor that operated at PNNL at Hanford, actually. But that reactor was fueled by a mix oxide of plutonium and uranium fuel. The EBR-II was a uranium metal alloy, if you will, uranium fissium specifically, fissium just being a uranium alloyed with stable elements to represent the expected fission products.

So the EBR-II operated pretty much in a steady state like the reactors that were considered in TIB-54. But, you know, being an experimental reactor, there were numerous subassemblies that were placed in the core at various times for, you know, research purposes.

So, again, this is a good test bed, if you will, with respect to looking at how it compares with TIB-54.

Next, John. Okay, likewise, the BORAX-IV, is a thorium-fuel reactor, which we didn't really -- I don't think we have anything in the representative reactors we considered in TIB-54 that was thorium fueled. So that was the rationale for cleaning the BORAX-IV, which, again, was an experimental reactor. You know, we didn't run it for long periods of time. And ultimately it didn't run to a really high burn up. So this is some of the bases for selecting these two to start with.

Okay. So we discussed the reactors we selected. So now we're going to talk about how we modeled those. Again, as already has been discussed, we used the SCALE code system, which was likewise how we created TIB-54 in the first place, but this is later on.

So TIB-54 was created using Version 6.0 in the SCALE code system. For this Report 99, we used the current version, which is SCALE 6.23. So there was some improved capability there we were able to take

advantage of.

But basically there's two modules within scale that are primarily used, TRITON, which is a code used for nuclear fuel depletion and that's used in conjunction with the ORIGEN isotope generation completion code.

So the two of those together tell you the depletion of the nuclear fuel, which in other words gives you the composition of the fuel as a function of burn-up for a given lattice, given -- you know, a combination of fuel and fuel pins, moderators and so forth.

One difference between the model that we did for RPRT-0099 and TIB-54 was, whereas in TIB-54 were given reactor or given fuel assembly, whatever nominal power we used, reactor power we used for that case, that and whatever the target burn-up we wanted and just divided those two out. And I did that irradiation or did that model and said the reactor ran at that power constantly for, you know, whatever the required time was to get to the total burn-up.

But in other words I collapsed the -- I didn't account for real power history. I didn't account for the reactor power going up and down and up and down. I just collapsed everything into one long run.

And that was intentional. That was done to maximize the predictive or calculated short-lived fission products relative to the longer-lived fission products, relative to the indicator nuclides.

So that's just one of the numerous layers of conservatism we built into TIB-54. But for these reactors we considered in RPRT-0099. For the BORAX-IV, the EBR-II, we used a more realistic power history because that seemed more appropriate for this kind of comparison.

The TRITON and ORIGEN models were used, again, this is the fission product content at the end of the irradiation cycle for various combinations or the various fuel assemblies that we considered.

And then the ORIGEN code was then used in a standalone mode to decay those out for the same decay times that are considered in TIB-54, which are 10, 40, 180, and 365 days.

So the next couple of slides are some images showing the reactor modeling lattices. Sorry, John. I jumped one again.

Slide 16 is the lattice model for the EBR-II. And you can see the characteristics of hexagonal geometry for a fast reactor and the next slide, the next page, for the BORAX-IV, you see kind of a loose lattice, more of a power reactor type of a lattice that you would expect.

But in both cases you see the -- this one was done by Dr. John Hamawi. You see the levels, the completeness and the detail he included in his models. He did a really nice job with those.

Okay. So the -- actually, John, let's go ahead and jump up one slide to 19 for the table. This text here just talks about that table.

So this information here, these are reactor modeling parameters that were used for the EBR-II and just there were three -- as we said, EBR-II used a number of different fuels and fuel assemblies. Three of those were selected for consideration in RPRT-0099.

There's a Mark IA fuel assembly that was a radiator or a model using average, you know, typical parameters. There's a Mark II assembly that I believe was a model using maximum parameters. And there was also one of the experimental assemblies.

So from the table there, you can see the different burn-ups that were modeled for those different assemblies. We also see the uptime and the lifetime in days that were used.

I would point out those uptime and lifetime were totals. Those are telling you that the sum of the uptime -- and the sum of the uptime plus the

downtime. That's not telling you the sequence of up, down, up, down, up, down that were actually used in those reactor models.

And RPRT-0099 itself references -- there's some very detailed reports that cover these reactor models in great detail. Those are actually referenced in RPRT-0099.

All right. And likewise, the slide here showing the reactor model and the parameters that were used for the BORAX-IV. The BORAX-IV, EBR-II modeled -- Dr. Hamawi modeled specific subassemblies for the BORAX-IV. The entire core was modeled. Basically, he modeled a quarter core and then that was expanded up for the entire thing.

Okay. So the output of the reactor modeling then is the source term, the fission and activation product content in the fuel at end of life.

So we had a number of slides here talking about how we use those to get to the doses that we compare with those from TIB-54. But in a nutshell, it is the identical process that we followed in TIB-54, or as I said, we used the exact same method. The only difference was the source term.

So the exposure pathway -- oops, John. You jumped on me. That's fine. The exposure pathway was inhalation of airborne mixed fission and activation products.

And we used two intake periods, a two-year period and a ten-year period. We calculated those to 28 ORIGENs, the 28 ICRP-68 ORIGEN specifically, that are considered in TIB-54. Noble gases and actinides were excluded, which is always going to be the case. TIB-54 addresses only fission and activation products, not actinides. And the noble gases are taken out because there's no internal doses associated with those.

But the next bullet there makes the point that even though we take the noble gases out we leave the

noble gas decay products in. So it's not like the downstream particulates are being omitted or lost in the source term.

The next slide. As in TIB-54 we considered three different types of cases for urinalysis. We have gross beta urinalysis where minimal chemical separation was performed, a gross beta urinalysis where, you know, separation chemistry was performed, strontium separation chemistry specifically, and a gross gamma analysis.

And then for each one of those three cases, we run the source term with and without the iodines. There were some cases, you know, facilities applied iodine filtration and such, you know. Later on it was less likely for orders to get iodine intakes early on. But we ran them both ways.

And then the following slides are going through discussing what I termed the -- that's how the manual calculations were done as opposed to those that just come out of the TIB-54 software tool. And, again, this is just summarizing the process used in TIB-54 to begin with.

So we take the source term from the reactor modeling. The next step in that process we apply release fractions from a given DOE standard, the DOE 1027 standard specifically, which pertains to accident analyses for different types of nuclear facilities.

So the product of the source term and the release fractions we treat that as if that was what was in the air and available for the worker to inhale. So we multiplied those out on an activity basis and then we normalized them. Everything is stated relative to everything it. So that's how we come up with what we call the normalized intake fractions, the NIFs values.

Following that then we used published or tabulated organ dose per unit intake, or committed organ dose per unit intake factors. And we take this really long list of isotopes from the reactor modeling and using

these, you know, published committed dose factors, we determined the isotopes that deliver greater than or equal to one percent of dose to any organ.

And we select those. And that gives us our list of what we call our dosimetrically significant nuclides. So that takes our list of 900 or so fission and activation products and collapses it down to about 30 or so that were actually the dose drivers, the internal dose drivers.

And in TIB-54 that occurs in or is presented in TIB-54 Table D-1, just in our local vernacular here, we tend to refer to those 30 dosimetrically significant nuclides as the D-1 nuclides. We use that term for hearings using that term.

So then the next step in the process, we take that list of D-1 nuclides, and we assume a two year chronic intake. We use intake retention fractions calculated, assuming a two year chronic inflation intake, and we calculate what we would then see in 24 hour urine.

So at that point, we can take the -- you know, we have that on an isotopic basis. So at that point, that's what gives us our urine activity fractions. We take the ratio of the cesium-137 or the strontium-90 as appropriate to the total and that's what gives us our given gross beta or gross gamma analysis. That's what tells us of the component of our composition of that that we assign to the indicator radionuclide.

And then I want to jump ahead to Item E here. And once we calculate this list of dosimetrically significant nuclides, about 30 something nuclides long, there's an additional step that we put in TIB-54 back in the day when these calculations were done manually.

The original early version of TIB-54 we considered, I think there were four representative reactors. And we actually averaged everything together. So it was just a single set of urine activity fractions and associated nuclide values.

So at that point, or back then, the dose

reconstructors did all those calculations manually when they were actually evaluating a claim. So in an effort to make the calculational burden a little less on them, we added a step where we took that list of 30 nuclides, and we reduced it further based on contribution to committed effective dose.

So just as the initial list of 30 was based on contributions to committed organ dose, we likewise determined the nuclides that contributed greater than or equal to one percent to committed effectiveness and that reduced the list from 30 to 17 or 18 or so.

And if you look at TIB-54, you'll see those presented in Table E-1, the so-called E-1 isotopes. And it's those E-1 nuclides that are actually used for those eventual dose calculations. Those activity fractions, ratioed to the cesium and strontium, are the associated nuclide fractions that are used for dose assignment.

So then back to Item D. Item D is kind of a housekeeping item. I was talking about in RPRT-0099, how, in general, we have a bioassay result of whatever for a given claim. The dose reconstuctor would then, in principle, would multiply that by the urine activity fraction and back-calculate the intake of the indicator radionuclide and then apply the associated radionuclide fractions to get the dose.

But what's done in practice is that gross beta or gross gamma urinalysis result, we assume that it's all indicator radionuclide, calculate that intake and then that gets multiplied by the urine activity fraction and the dose calculations proceed from there.

You get the same result but it makes the calculation more straightforward. And that's what Item D there is talking about.

And then, as I said, once we have the indicator radionuclide intake, then we calculate the organ doses using the associated radionuclide fractions, the so-called E-1 isotopes.

So the bottom line is we crank through that process manually using the same spreadsheets and other analytical tools that are used to create TIB-54 in the first place, took the source terms for the EBR-II and the BORAX-IV, calculated all those organ doses and then we compared those with the output from the TIB-54 tool for the same intake, the same assumed intake. And, again, we assumed an intake. We gave a unit 24 hour urine result of one picocurie per day.

And, John, I jumped up to Slide 28 here. So, well, 28 and 29 kind of go hand-in-hand. But so to compare one to the other, the TIB-54 results relative to the manual calculations for EBR-II and BORAX-IV, we simply ratioed the two for each of the three urinalysis types, the gross beta, the gross beta with separation, and gross gamma.

And for each of the four reactor fuel, reactor fuel assemblies that were considered, the BORAX-IV and the three EBR-II facilities, and, again, we just took straight ratios of those and then we compared.

So if you look at the next slide, so there is a table there. Thank you, John. For each one of the bioassay types and for each of the four reactor fuel assemblies that were considered, of course, there's 28 individual results for all 28 organs that are compared.

What this table is showing is the lowest ratios of TIB-54 to RPRT-0099, to the EBR-II and the BORAX-IV dose results, and the lowest ratios meaning the cases where the organs for which the doses were the closest together. So, again, we're ratioing TIB-54 to the reactors under consideration. Anything greater than one means the dose from TIB-54 exceeded that or vice versa.

So, again, these are just the lowest values or the cases where the doses were the most similar or were the closest together.

So for instance just in the first line there, for the minimally processed gross beta urinalysis with the iodines included, you see from the BORAX-IV, the

ratio. This smallest ratio between the two was a factor of 1.03 for the bone surfaces. And then you can just move across the line there. For the Mark IA, the EBR-II assembly it is about two percent higher for the liver and so forth.

The lowest number on that page is for the gross gamma with iodine for the Mark IA assay from the EBR-II where you see the organ doses were essentially in unity for both the thymus and for the esophagus.

Jumping back to the previous slide, and so we see that the ratios are all greater than one. But in some cases not by much. So we're not suggesting that that inclusion that we showed in RPRT-0099 would be excluded to the other reactors. That clearly is something that's going to require further evaluation.

The only other point I want to make here is regarding interpretation of these values on this table on Page 29. So if we have values greater than one, you know, that would give us assurance that TIB-54 is bounded from these reactors. But I don't want to give anyone the impression that the inverse of that would be true, if we saw values less than one that that would mean that TIB-54 was not bounding. That is not the case because keep in mind, you know, we developed TIB-54 to be sufficiently bounding.

Our goal was to create a tool that assigned a dose that, you know, we were confident exceeded any real workers real dose but not excessively so. Our goal was to -- you know, the ballpark we were shooting for there was an order of magnitude.

So, you know, it would be entirely possible to postulate a set of reactor parameters that would give a higher dose than what TIB-54 would predict or would produce. But by no means would that mean that TIB-54 was bounding --- or was not bounding. Excuse me.

So just to summarize, as has been discussed, TIB-54 is the tool that we use when we have gross beta or

gross gamma bioassays, to have an isotopic mix for those for the purposes of dose reconstruction.

As SC&A discussed during its previous report asking and, you know, seeking to verify TIB-54 enveloped all these reactors that operated INL over the years and prioritizing those.

So in RPRT-0099 was our, you know, initial evaluation of that question for the BORAX-IV and the EBR-II reactor systems and, you know, it did show that TIB-54 bounded those. But, you know, additional work is needed for these other reactors.

So RPRT-0099 documents the first two of those and just basically that's where we are.

Dr. Roberts: Okay.

Mr. Burns: And, John, I'll kick it back to you.

Mr. Cardarelli: Thanks, Bob. And I'll pass it on to you, Dr. Roberts.

Work Group Discussion

Dr. Roberts: Okay, great. I would just ask if the Working Group Members have any questions.

Member Beach: None here. This is Josie.

Dr. Roberts: Go ahead, Josie.

Member Beach: No, sorry. I said none here.

Dr. Roberts: Okay. Anyone else?

Member Anderson: I don't have any either. This is Andy. I still don't understand it all.

Member Roessler: This is Gen. I don't have any questions.

Chair Schofield: Yes, this is Phil. I don't have any questions.

Dr. Roberts: Okay.

Dr. Ostrow: This is Steve Ostrow from SC&A again. I just have a general question for NIOSH. So I assume that you're going to be using a similar technique to analyze the other reactors? Is that true?

Mr. Cardarelli: Bob?

Mr. Burns: Go ahead. Oh, was that for me? Sorry, I thought you said to NIOSH.

Mr. Cardarelli: Oh, okay, Bob. I'm sorry. I get mixed up sometimes.

Mr. Burns: I'll go. No problem at all. Boy, I don't want to answer your question -- it's a good question. But, I mean, we will certainly go down that path. But I think there's other methods we could consider here.

You know, the first question I would have as I was alluding to, okay, we have these ratios to come out less than one what does that mean? So, the question I would have at what point would we concerned about TIB-54 being bounding?

If I saw a ratio of .9, .8, I don't think that would bother me. If it started getting down to .2 or something, that might give me pause given, like, I said, versus our goal of bounding real workers to, you know -- or real doses to real workers by an order of magnitude.

So that said, something else we've considered is in addition to this type of an evaluation or something along that line is actually making use of all of the bioassay data we've collected over the years.

And I've not described -- you know, keep in mind that TIB-54 is a complex-wide document. But make use of that and, you know, apply some of these modeling assumptions and, you know, through TIB-54 look at what the predicted bioassay data would be, compare that to what we actually see in the field and give that -- you know, use that as kind of the defense-in-depth type of evaluation with respect to bounding, if you will. Excuse me.

Dr. Ostrow: Okay. Thank you.

Dr. Roberts: Okay. Any other questions or comments or points of discussion on the OTIB?

Dr. Ostrow: Well, this is Steve again. Just want to ask the Work Group, does SC&A have direction to go ahead and look at this report that NIOSH produced, ORAU produced?

Dr. Roberts: Okay. I'm going to defer -- Phil, what's your thought?

Chair Schofield: I would say let's go ahead and have them do it.

Dr. Roberts: Okay. Go ahead.

Dr. Ostrow: Great. Thank you.

83.14 Verification and Validation (V&V) of Temporary Badges at the Chemical Processing Plant (1975-1980); SEC-00238; SC&A June 25, 2020 memo

Dr. Roberts: Okay. Anything else on this topic. Okay. Well, if none, let's move into SC&A's presentation of its memo on the 83.14 V&V of temporary badges at the Chemical Processing Plant for '75 to '80.

Mr. Barton: Okay. Thank you, Dr. Roberts. This is Bob Barton again. I do not have presentation slides for this. I'm honestly not sure how helpful they would have been because this report is really loaded down with Privacy Act considering it's really focused on the claimant population.

But I'll be working right off the PA cleared report memo, memo report that's on the website. And I'll throw it up here on Skype for those of you, just for ease of reference. But I'll try not to scroll through really too quickly because I'm not sure how Skype is going to react to that.

Anyway, we're talking about the 83.14 for the Chemical Processing Plant, and this is from 1975 to

1980. And a bit of history, because I think it's helpful to be able to put this in context.

This is actually the third SEC period for CPP. And the first period ran from 1963 into early 1970 and then you have early 1970 through 1974 and then you have this 83.14 period.

And they're really delineated by what the external badging requirements for the Class Definition itself. As you can see, the 83.14 Definition is up on the screen right there. And, again, so it's very similar to that first period, '63 to '70 where an external badge is required to essentially become part of the class for adjudication purposes.

So you couldn't just be an INL worker. You had to have proof that you entered the Chemical Processing Plant during that period and that proof is really in the external badging requirements.

So that badging requirement is a little unusual in this program. And so it obviously gave the Work Group and the Board a little bit of pause.

So during the process of sort of digging into that, it was discovered that for INL, for temporary and visitor badges, in other words you didn't have necessarily a permanent at the site or at CPP. You might be issued a temporary badge.

And it was discovered that unless you accrued a positive dose on that temporary badge, INL had not what's known as indexed those badges with the individual who was issued the badge. So if you went to the site, you know, back prior to about 2016 and requested records for an individual, you would get whatever dosimetry records they had. But if there were temporary badges that had zero dose on them, you weren't getting them because the site just simply wasn't associating all those temporary badges with the individual.

So, again, back in 2016, DOE and INL, they performed a massive coding and indexing effort to

basically take all those temporary badges, enter them into their dosimetry indexing system so that now if you made a request for a claimant's dosimetry records, now you're getting all those temporary badges, even if there was a zero accrued dose on those.

So that sort of took care of that problem. But there was still definitely some concerns as these temporary badges were mostly handwritten during this period. And really the only identifying information was generally the person's name and the employer. There was no what's known as an S number or a security number, which is basically a unique identifier for the individual at the site.

So now you have this handwritten temporary badges, and you might have legibility issues. You could have multiple people with the same name or other types of human error that might have occurred during this coding effort so that the question remained is it still possible that we might inadvertently exclude someone from the SEC when in fact they did enter the Chemical Processing Plant during this period?

So, again, this is a little bit of history because this first period is very similar to what we did for this 83.14.

So the first period, SC&A developed a V&V strategy. Again, it's very similar to what we're going to be talking about here. Basically, we identified claimants who we knew had temporary badges at a Chemical Processing Plant. But if you went and looked into their individual dosimetry file they were missing.

So now DOE has done this coding effort. All of those temporary badges should be correctly ascribed to the Energy employees and so this shouldn't be a problem anymore.

So we developed a strategy where we said we're going to identify all these essentially missing records in some claimant files and then we're going to go re-request the records from the site and see what they

return and see if all those temporary badges that we know should be associated with the claim are now correctly included.

So that first V&V, again, for the 1963 to '70 period where it's required to have at least one badge to be included as part of the SEC, we actually found that DOE came back with about almost 95 percent what I'll call a success rate. That is 95 percent of the badges that SC&A had identified as missing were now being correctly included in those claim files.

And so that was actually presented before the Board back in last April, that's 2019, at the meeting in Pittsburgh. And that 95 or it was actually 94.5 percent was deemed acceptable.

And now we're back to the 83.14 period here, which was presented to the Board. And obviously similar concerns were voiced over that requirement of an external badge. So SC&A was tapped again with performing a very similar V&V evaluation that I just described.

Again, we're going to identify badges associated with claimants that we know were in CPP. They have a badge associated with CPP, but it is currently missing from their dosimetry file.

So we came up with our proposal of how we're going to do it. Again, it was very similar to what we've done for the earlier period. And that went in front of the Board in March of 2019 during the teleconference. And it was approved to move forward.

So that proposal included a total of 37 claims with 736 missing badges from their DOE monitoring file. So this is what we're going to check. We have a group of 37 claims that cover 736 missing badges. We're going to send those off and see what we get back from DOE.

Now what's a little different about this evaluation than the previous one I described, is this one is actually a little bit twofold. We were not only testing

DOE/INL's ability to correctly ascribe the temporary badges to the individual. But we had a secondary source.

And this is known as -- well I know it as NIOSH hot-linking. And as I understand it, this is basically a process that when NIOSH captures records during the normal process of research and a given claimant's name might be on it and the document is germane to dose reconstruction, it's essentially automatically linked to the claim file so that it can be used in the DR process.

So this is sort of a secondary piece of information, if you will, a separate piece of information that is just done through the course of the program. But it sort of provides a -- I guess, it's going to be a safety net, if you will, that if DOE misses the record, then there's a chance it would be picked up anyway through this hot-linking process and the claim would have the requisite evidence to be included in the SEC for CPP.

So we evaluated both what DOE was returning to us and also this facet of the program known as hot-linking. We evaluated them separately but then also what was the combined effect of the two.

I'm going to scroll down, and hopefully this doesn't make anyone sick here, to Table 1. It sort of shows the overall results. And this is Table 1. It's in SC&A's report on the website. Okay. I hope everybody can see that.

So, anyway, this is the overview of basically the success rate that we had. Again, we had over 736 badges that we wanted DOE to check. And then also we could just see what the NIOSH hot-linking process was going to produce at the same time. And, again, this hot-linking process is not related to the V&V. This is just something that is done as a matter of course in the program.

So as you can see from the table, DOE had an 82 percent success rate. In other words, 82 percent of those badges that SC&A had identified with the

claims were returned correctly. So 18 percent were still being missed.

When looking just at the NIOSH hot-linking process by itself, we had a very similar 83 percent success rate. And if you looked at the two in tandem, in other words, if DOE missed it, did the hot-linking process pick it up or if hot-linking missed it, did DOE pick it up? Overall, it was about a 93 percent success rate.

Now Table 2 is really loaded down with Privacy Act material. So it's pretty heavily redacted with good reason. But basically you can see line-by-line for each claim we looked at how many badges did SC&A identify? How many were correctly returned by DOE? How many were identified through NIOSH hot-linking?

And, again, I don't want to go through line-by-line. I'm not sure. But one word you might notice that there were actually three cases out of the 37 in which none of the identified temporary badges, these are badges identified by SC&A as associated with the claim, none of them that we identified were actually returned by DOE. So that's essentially on a specific claim, a zero percent success rate. And I'll get to these three claims in a minute, because really those are the most important, I feel.

But first, I just wanted to just quickly list some other takeaways from the V&V results. I'm going to scroll back down to the conclusions. Again, I don't know what this looks like on other people's Skype. Look away if you're starting to feel seasick.

Okay. So as I just said overall, there was an 83 percent success rate for the NIOSH hot-linking process. There was an 82 percent success rate from DOE.

Now, again, by comparison, when we did this for the earlier period, we actually got nearly a 95 percent success rate, and that's very surprising. The reason being, in the earlier period, like I said, you only had a name and a company to really go off of, and they

still got 95 percent of them that we could identify them. So now we're down to 82 percent, which is a fairly marked decrease.

And the reason that's surprising is in this latter period, the visitor badges were often typed and not handwritten and also they would include an identifying piece of information, the security number. You would think with three pieces of information, the security number, the name, and the employer, it would be easier to identify these badges, but that wasn't the case this time around. And we're not sure why that is.

But, again, when you considered both the DOE success rate and the NIOSH hot-linking success rate in tandem, you end up with about a 93 percent success rate in correctly ascribing these temporary badges with the claimant.

Also eight of these 37 contained 100 percent temporary badges identified for the hot-linking process. So eight of 37, the NIOSH process got all 100 percent that SC&A had identified, 15 of 37 contained 100 percent from DOE. And then when you looked at them combined, 19 of 37 contained all the temporary badges if you looked at both the hot-linking and the DOE provided dosimetry, when you take them in combination.

And of those three cases where DOE did not return any of the temporary badges that we had identified. So for two of the cases, as I said, DOE did not return any of them. However, the NIOSH hot-linking process actually found 90 percent and 100 percent of the badges for those two individuals, respectively.

So I guess that's one of those cases where even though DOE happened to miss them, this sort of secondary function that the program does, again, for all sites -- this is not related to INL or related to the V&V -- that process itself identified 90 percent and 100 percent where DOE came back with zero.

The third case is a little bit more troubling. Again,

DOE did not return any of the temporary badges that were identified by SC&A. And so in this case, there was actually no hot-linking in the claim file. And I believe the reason for this is hot-linking has been, relative to the program, a sort of recent development. And this case itself had been adjudicated. The gross reconstruction had been done quite a while back.

So I'm not sure if this process was really being utilized when this claim was being researched for the purposes of DR and I think, and I'll let NIOSH certainly comment on that, I believe if any of these cases where hot-linking wasn't performed, if they were reopened, you know, for example for a Program Evaluation Report or anything like that, I believe then that process would kick in.

But I'm just assuming that for this one case where we got nothing from DOE and the NIOSH function wasn't performed, I believe it's just because of the age of the case, when it was submitted and when it was worked.

But to get back what was really more, I guess, concerning, you know, was when we looked at why DOE might have actually missed this one and missed all the records that we had identified.

What appears to have happened is when we sent the information back to the site, back to DOE and INL to research the claim and return all the dosimetry records, that's what we asked for, just do it again. Research the case again and give us everything you got.

And we got nothing back. If you dig a little further in there, it appears that the site researched an Energy employee who had the same name but had a different Social Security number than what was requested.

So that is the reason why none of the records for that individual were returned. So on their end we made the correct request for this individual, but what they

researched was the incorrect Social Security for that particular claim.

So that's really an overview of the results of this V&V investigation. Again, the main question is what are the chances that someone might slip through the cracks and be excluded from the SEC when they really should be included because of the requirement of having a badge, whether it be a regular badge or a temporary badge.

And so the success rate for DOE was 82 percent based on that NIOSH hot-linking process, the 83 percent. And when you take the two in tandem, it's 93 percent.

So that sort of ends my little spiel here. I won't call it a presentation because I didn't have slides. But I would be happy to entertain any questions.

Member Beach: Bob, this is Josie. I just have a typo question. On Page 6 under Number 17, if you just look across, the percentage is 23, 21, 21 and then it's 2.

Should that be a -- would that be a 21 or a 22? It's in your Table 2. Second from the bottom, no, the bottom one. Do you see which one I'm talking about? The one that says 2 96 percent? Hello?

Chair Schofield: Bob, are you still on?

Mr. Barton: I'm sorry, everybody. I think I got on mute somehow. Yes, I see what you're talking about. So what you're seeing that should not be two. Likely, it's probably 22.

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

Mr. Barton: Yes. Both NIOSH hot-linking and DOE returned 21. But probably not the same 21 badges. Probably taking in combination, that should be 22 not just 2. That's a good catch.

Member Beach: Okay.

Dr. Taulbee: One point -- this is Tim -- that I would like to try and point out here. Of the 37 people, remember, this methodology is for inclusion into the SEC. Of these 37 people that Bob looked at, which is a small sample, 36 of them made it in the SEC based upon these results. One that is not, it appears that the site responded with the incorrect Social Security number for a claim for somebody else.

So we are actually following up now with the site to request that additional one. Well, I guess, in case the worker requests that. If this is sufficient, then we won't make that request to go and do that follow-up. But, you know, the way this stands right now, 36 of 37, which comes out to 97 percent of the people would be correctly identified into the SEC.

Member Beach: And then, Tim, what's the mechanism, not on the sampling here, what's your mechanism in place if there is one person that is not included in the SEC but that person says, "well, I was there"? What do you do to go back and correct that?

Dr. Taulbee: Well, for one thing, you know, if they indicated that in their CATI, for one thing, we would certainly be doing more investigation along those lines to see: is there any indication in the records? Did we miss something? Did DOE miss something? And we would do a follow-up with DOE, you know, asking specifically about it. And they can go through their records and search again.

So, when somebody indicates or affirms that they were there at CPP, we would go through extra effort to try and verify whether we have temporary badges for them.

Member Beach: Is that a follow-up that happens without the person requesting it? Is that something you could go, "well, this person, based on what we know, should have records." Would you do it automatically or would it require something from the person?

Dr. Taulbee: No, I believe we would do it

automatically. The person doing the dose reconstruction would look at it and say, hey, I've got dosimetry here for CPP, or they're saying they worked at CPP in their CATI, and then they would do follow-up.

So I don't believe there's anything that the claimant has to indicate other than during the CATI. Or, you know, if we see something that points to them working at CPP; like, it could be a bioassay result, for example, that existed for them at CPP, that would raise a flag as well with the dose reconstructor.

Member Beach: Thank you.

Dr. Roberts: Any other questions or comments on the V&V?

Okay. So where does this leave things, is my question?

Member Beach: I believe, as a Work Group, we would have to say whether we agree with this or not, right?

Dr. Roberts: So, does that track for you?

(Simultaneous speaking.)

Chair Schofield: Anybody have any comments?

Member Roessler: I was going to make a comment. In view of what Tim just added to the analysis and apparently bringing the number up to 97 percent, it seems to me that, compared to the one we approved earlier, then this looks good to me, if I understand it right.

Member Beach: Gen, that was what my conclusion was also. This is Josie. I agree with that perspective.

Member Anderson: Yeah, I would, too. I mean, they identified a few things. But I think it has practical utility and it really covers it pretty good.

I think your question, Josie, about what happens if in an interview an individual says I was there, so they're

kind of that 1 out of 99 or 97 percent, I think that follow-up is appropriate, too. I think there was a substantial number reviewed here, so I think that adds to the confidence in it.

Member Roessler: I guess I would take my comment and put it into a motion that the Work Group approves this approach.

Mr. Barton: Well, if I may, this is Bob. The SEC Class Definition, as it is right now, which includes the requirement for a badge, has already been approved. So it's really a question of whether the Work Group approves of that requirement, that it is feasible, or the Work Group feels there is not a realistic chance that a person will be left behind, so to speak, because that was the question at the onset.

The SEC definition was approved right away because we didn't want to drag it out. But the question remains, did it need to be changed in light of this analysis? Did it need to be changed from requiring a badge at the Chemical Processing Plant to something more universal like just requiring an INL badge?

As I said at the outset, this is sort of that middle SEC period from '70 to '74 where the requirement is just simply an INL badge. And the reason for that is because you could take a badge from TAN or TRA and use that to enter CPP, whereas the period we're talking about now, you would literally leave your badge at TAN, go to CPP, pick up a new badge at that location. And then, when you left CPP, leave your CPP badge at the cart rack there.

And that's something we looked at as part of our proposal. And we found that there were many workers who had as many as five different site badges during the same month. You know, they had a badge at essentially each area.

So the question really is, does the Work Group approve of the Class Definition as currently written and is being administered, you know, right now?

Member Roessler: Based on what you've just shown. Is that --

Mr. Barton: That's correct. The action for SC&A was, this activity was essentially to give confidence or give the Work Group pause about the requirement of having a Chemical Processing Plant-specific badge rather than expanding it to just simply being monitored at INL.

Chair Schofield: I think it gives me a lot of confidence in what it's showing. But that's my own personal opinion.

Member Anderson: So, no need to change anything, is what we're basically concluding. Nobody gets left out if you have to have a badge --

Mr. Barton: That is correct.

Member Anderson: -- at a site.

Chair Schofield: So I'd say all in favor?

(Chorus of ayes.)

Dr. Roberts: So it sounds like everyone is in agreement, is what I'm hearing.

Member Anderson: Yes.

Chair Schofield: Yes.

Dr. Roberts: Now, is this something -- it feels like something that needs to be brought up in the August meeting of the full Board.

Member Roessler: Yes.

Dr. Roberts: Yes. Okay.

Chair Schofield: Yeah.

Dr. Roberts: Okay. Great.

Member Anderson: It doesn't have to be a long thing. Just that this review was done and we reviewed the

results of it and confirmed the appropriateness of the case definition.

SEC Petitioner Commments

Dr. Roberts: Okay. Okay. Great. So it sounds like we're done with this issue. So, if okay, I'm not sure if there are any petitioners on the line, that we do have an agenda item for any petitioners who may be on the line to comment.

(No response.)

Work Group Discussion

August Board Meeting Session Plans

Dr. Roberts: Okay. I'm not hearing anyone.

Okay. Then I think we can move to the final point on the agenda, which is the discussion of the August Board meeting session plan, which seems like a brief summary of what we discussed on the V&V would be appropriate to cover in the Board meeting.

Are there other items from the Work Group that we need to cover in August?

Chair Schofield: Not in August, but I would like to see a little more fleshing out of SC&A and NIOSH's position on how the, let me say, the quality of the data that they're using for chronic out at the waste pits.

Dr. Roberts: Mm-hmm. And to move that forward, what more is needed?

Chair Schofield: I think a simple White Paper or maybe just a telephone conference call, you know, kind of distill it down to where the differences are still. And then, instead of going back through everything, you know, "this is our point of view and this is why we're here," and see where they actually -- they may be closer together than it sounds like. I mean, we covered a lot of ground today.

Dr. Roberts: Yeah.

Member Anderson: Are we going to get a summary of the interview data from NIOSH? I think that will be helpful. I mean, that's a deliverable we probably won't get before the August meeting. But I think, once we have that, that will help resolve the variability and interpretation of what the interviews provided.

Dr. Roberts: Mm-hmm. So we're looking at another Work Group meeting, possibly, down the line. It probably would be after the August Board meeting to come back together on that.

Chair Schofield: Yeah, I don't see enough time for people to get through and look through those interviews. And DCAS is going to put it together so we just have -- instead of having to look all over the database, we have it one place. I'd be interested in going back through those.

Dr. Roberts: Okay. Great.

Member Anderson: We'll have to come to a conclusion on the use of the coworker model. And that group of 18, does that meet the criteria for being appropriate coworker information since it's different in time period and it's different in the actual activities.

Dr. Roberts: Mm-hmm.

Member Anderson: I think the whole thing -- if we don't feel that's an appropriate coworker group, then doing dose reconstruction with existing data really doesn't support that.

Dr. Roberts: Mm-hmm. Okay.

Member Anderson: We did a little discussion about that, but I think that -- at least in my mind, and this is Andy -- that's a key factor.

Dr. Roberts: Mm-hmm.

Chair Schofield: Well put.

Member Anderson: I mean, the descriptive chronology and what went on the site and things like that, that's interesting. But the crux of the matter is: what about dose reconstruction for those workers who were there? And this is coworker group adequate to do that?

Dr. Roberts: Right.

Member Anderson: And I think there were some questions about that.

Dr. Roberts: Yeah. So you're referring to the group of 18.

Member Anderson: Yes.

Dr. Roberts: Okay. Anything else?

Member Beach: So, how many -- we've got, what, three items here? SC&A to review NIOSH's OTIB-099, the new report that came out. And then the interviews. And then, SC&A, will you give us anything on the Burial Grounds in response to NIOSH? Or --

Mr. Findley: In terms of the backup of 18 workers' data?

Chair Schofield: Yes.

Mr. Findley: Well, I think, Bob, we provided our comments. I guess the issue is NIOSH responding to those comments.

Dr. Roberts: Okay. Yes.

Mr. Findley: Yeah, our May report has our view of that and raises some questions that perhaps NIOSH can provide some early answers to the Work Group.

Dr. Roberts: Mm-hmm.

Dr. Taulbee: Okay. We can do that. This is Tim.

Chair Schofield: Gen, do you have anything?

(No response.)

Dr. Roberts: Okay. So we've got some good follow-up action items, it sounds like. We do have one small bullet on Board Review System Entries that I didn't want to skip. So I just wanted to open that up.

Dr. Ostrow: Okay. Hi. This is Steve. I'll see if I can share the PowerPoint presentation.

Dr. Roberts: Okay.

Member Anderson: Did we resolve the redacting issue?

Member Beach: No.

Member Anderson: Whoops.

Ms. Naylor: Okay. So, what is it that needs to be resolved?

Chair Schofield: I seems to me legal is going to have to sit down with us and we're going to have to figure out this whole redaction. Because I have to agree what Josie's comments earlier were. This seems like a whole new ballgame on this now, unless I misinterpreted what Josie said.

Ms. Naylor: Josie, OGC is not changing any policy. There's not one policy. There's no policy. It's about doing the job of balancing the litigation risk to the Department and balancing that with public access to information under the FOIA proactive release policy.

I mean, I'm not sure what is it that the Board is concerned about, because you all have access to the redacted information. In fact, the un-PA-cleared documents, the unredacted documents, have been sent to you guys even prior to the PA redacted version. So you should already have the report without any redactions in it.

Chair Schofield. Okay. I'll have to go back over that.

Ms. Naylor: I mean, is the concern here that the

Board is not getting the information that you need in your deliberations? Or is the concern that the public is not getting the information?

Member Beach: Well, I think a combination. And it just seems like it's changed, even from the 2017 report up until now. And you don't need to re-explain all of that. I'm not 100 percent satisfied with that, with the -- but I'm not 100 percent sure where to go at this point. It's very inconsistent, in my view.

Ms. Naylor: What is inconsistent is the information that's provided in the -- the amount of information being provided in the 2020 report. When more information is provided, a decision needs to be made on whether more information needs to be redacted.

Member Anderson: So it's really a cumulative thing?

Ms. Naylor: Every time.

Member Anderson: Yeah. So, we have multiple documents that have put in quotes from the interviews. And when another report goes back to the same interviews, it doesn't use the exact same quote previously. You have to look at cumulative references to the same individual's interview as now that rises to a level of concern. And I think that's -- I'm not sure the Board is appreciative of that, if that's the case.

Ms. Naylor: So, for example, in the 2017 report, there was one individual with two quotes attributed to it. In the 2020 report, there were five quotes attributed to the same person.

Member Anderson: Yeah.

Ms. Naylor: So, I mean, that is the concern here.

Dr. Taulbee: And this is Tim. If I could interject here. Because Jenny mentioned something there that I'm hoping everybody is really grasping: that you have copies of the unredacted reports. All of the Board

Members have a copy of that. So, all of your decision basis can be off of the unredacted. You know, you've got the actual information sitting there. The only thing that Jenny is redacting is the identification that goes out to the public.

Chair Schofield: Would it be possible that some of these comments they're making kind of in a generalized way, maybe we have two or three people who make similar comments about a subject, and we could break that out from one person and say, you know, "here's some of the comments that were put forth by people"? I don't know. That's why I'm asking.

Ms. Naylor: I guess, you know, you have to look at this on a case-by-case basis, right? And what is the objective here? Is it to provide the public with more information than what's currently been redacted by the OGC?

If that's the case, I'm always happy to take a second look. And also public members can send a Federal Advisory Committee Act record request to the DFO. And maybe at that time there's a second review of the redaction that is made under the proactive release policy under FACA.

So, I mean, public members do have several ways of getting to the information. However, it still means that -- you know, the Department still has a statutory responsibility to protect the privacy of those who come forward and tell us their stories, as well as preserving the program's integrity to make sure that future workers will be willing to talk to us.

(Pause.)

Chair Schofield: Well, maybe once they put everything in that file, then we can access it and that'll answer those questions for us, I hope.

Dr. Taulbee: This is Tim. What we will be sending you will be unredacted, just as I mentioned before. So you will see the full version of everything. However,

what ends up going out to the web as far as a discussion will be heavily redacted based upon those interviews. So, keep that in mind. Again, the Work Group Members will have an unredacted version.

Chair Schofield: Okay.

Member Roessler: So, Tim, how will you be sending those?

Member Anderson: Through your CDC account, right?

(Simultaneous speaking.)

Member Anderson: If you don't have a computer, you're out of luck. Yeah, that's the problem.

(Simultaneous speaking.)

Dr. Taulbee: We'll mail it.

Member Roessler: Okay, by FedEx or something. Okay.

Dr. Roberts: To folks who can't access their CDC accounts.

Member Roessler: Okay. We should let who know, then?

Dr. Taulbee: Rashaun.

Dr. Roberts: Yes, me.

Member Roessler: Okay. All right. In writing probably, right? Or are you taking notes now?

Dr. Roberts: No, I have the note.

Member Roessler: Okay. So I don't have to let you know I want it by FedEx or some other means?

Dr. Roberts: No, no, I'll make note of that now.

Member Roessler: Okay. Okay, good.

Mr. Barton: This is Bob. Can I just ask: did all the Work Group Members today, were they able to get -

- were you all able to get unredacted copies of the reports that were discussed today? Or do we need, possibly, to send copies of those out? Because I think in this case it's very important that you see unredacted copies.

Member Roessler: Yes, I need an unredacted copy. I didn't realize until too late that mine was so redacted.

Dr. Roberts: Right. But, you know, they are --

(Simultaneous speaking.)

Dr. Roberts: Typically, what I will do when the non-cleared version is sent out, I will email your non-CDC account and tell you to check your CDC account for the unredacted version of it. And then if you don't have access to it, then we typically FedEx it to you.

Member Roessler: That sounds good.

Member Anderson: The only troubles I've ever had is trying to get into the base storage, because I don't go there that often. So it's very helpful when you send it, you know, to my CDC confidential site as an attachment. That's a lot easier for me than trying to go into the data system to figure out the numbers on the various documents and things like that.

Board Review System Entries

Dr. Roberts: Okay. Are we ready to move into the Board Review System Entries?

Chair Schofield: I believe so.

Dr. Ostrow: Okay. This is Steve Ostrow. Can everyone see the slide I have up?

Chair Schofield: No, I don't see it.

Dr. Roberts: Not yet.

Dr. Ostrow: It should be. I've been sharing it. It should be there.

Member Anderson: Okay. It will be there in a minute.

Member Anderson: It's still loading. It's there.

Dr. Ostrow: Okay. That's it. Okay. Great. This is just a simple little thing. The Board Review System, BRS, we started into NIOSH 17 years ago, into INL 17 years ago. NIOSH issued its first TBDs in November 2003. SC&A did its first review in 2005. The first Work Group meeting, INL Work Group meeting, was 2009.

And since then there's been many revisions of the TBD, lots of back and forth between all the parties. And we ended up identifying 38 Site Profile review issues. And there were tons of documents that went behind this; I won't even bother listing them.

And it turns out that none of the issues were ever posted in the BRS. And this was typical for a lot of the sites, not just the INL site. Last year, 2019, the project DFO at the time, Ted Katz, directed SC&A to form a comprehensive update of the BRS, not just INL but for all the different.

SC&A went ahead. We went through all our documents and back and forth, and we sent a draft BRS Site Profile issues file to NIOSH to look at it and review it.

About a year later, March 2020, NIOSH marked up SC&A's 38 issues. And for the issues, it's not just the issue, it's the whole timeline. At such and such a date, SC&A produced a report. On such and such a date NIOSH produced a report and response and there was a Work Group meeting. So it's the whole timeline. And it has links in it, too, that you can click on different reports and you can actually pull them up in the BRS.

So, in March 2020, NIOSH sent us a mark-up that had grown now to 112 pages of comments and back and forth. And that was Megan Lobaugh, who is out right now on leave.

We thought NIOSH made a real great effort on this and a lot of really helpful things. And, between April and June, we did some revisions of the Site Profile

issues file. And then we worked with NIOSH to actually post it with the BRS, which is not a trivial process. It's one of these things that takes a little bit of technical skills to do that. But we worked closely with NIOSH and got all the secret ways of doing it and so forth. So, we did it.

And just recently, July 3rd, the Site Profile Issues BRS went live. Which means that, if you go to the BRS, which I believe is under the DCAS tool set, and click on that and go to the INL Site Profile Issues, you have a discussion of each individual issue and links to the actual documents that are referenced, which I think would be -- we'd like to revolve these 38 issues eventually, I'm sure. So, this would be very helpful for the Work Group.

This is just information on how it's listed. And the 38 issues, this is where we are right now, 20 of the issues are closed, 16 are in progress, and two are in the abeyance.

I believe the distinction, in progress means we've talked about it, discussed it, but still up in the air. It hasn't been resolved yet. In abeyance, I think it means we haven't dealt with it yet.

I just made a comment that two of the issues were actually combined, 9 and 23 are close enough together that everyone agreed to combine it.

And the future activities for this. So far these are just Site Profile issues. There are also SEC issues, too, that came up in the last couple of years looking at the SECs at INL and ANL-West.

In April 2019, we sent NIOSH 35 draft SEC BRS entries for their review and comment. And we don't know exactly where NIOSH is on this, but we assume that they will go ahead and comment like they did on the Site Profile issues. And those will eventually be put into the BRS as a separate section.

It's a moving target because we stopped looking at Site Profile issues two or three years ago because

we're giving priority to SEC issues. But the SECs have been moving along, so some of these issues SEC issues will have to either modified or we may answer them and so forth.

Just a note that at the May 16th, 2017 Work Group meeting, we had found three of the issues, LOFT Reactor, the HTRE test, and the Material Test Reactor, which came out of the SEC deliberations, should really be transferred to the Site Profile -- they should become Site Profile issues. This was an agreement between us and NIOSH and the Work Group.

NIOSH advised us the correct way to do this is not to transfer them now to the Site Profile BRS but wait until they're actually in the SEC BRS, which will come eventually, and then do a formal transfer of the issues from one to the other.

So, that's where we are right now. And if anyone wants to look at it, it's actually up and live, the BRS for this.

Member Beach: Steve, this is Josie. I did review it, and I was mostly looking at the SEC issues. And so, let me clarify, NIOSH -- you have sent to NIOSH the different SEC issues. I think there's 30 of them. And you're waiting for a response back to update the BRS?

Dr. Ostrow: That's correct, Josie.

Member Beach: Okay. And I noticed those are unspecified SC&A users. So, at the time that you get those responses back from NIOSH, will you attribute a user to that specific SEC item and then add documents to those --

(Simultaneous speaking.)

Dr. Ostrow: Yes, we will. If you take a look at the Site Profile BRS that we just put in, we'll follow a similar format where we put in attribution on the issue. And we'll link to the reports also.

Member Beach: So that's something that needs to get some higher priority maybe, especially the SEC issues, to make sure those are tracking with where we're at as to the issues.

Tim, can you tell us, or somebody from NIOSH, where you guys are on that?

Mr. Cardarelli: Hi. This is John Cardarelli.

Dr. Taulbee: Go ahead, John.

Mr. Cardarelli: Okay. I am working with Megan. And we will definitely -- we have an action item to basically put our entries into the BRS. And we will work diligently on that. Hopefully, in the next month or so we should reconcile what we can into that data system. Tim, do you want to add anything?

Dr. Taulbee: No. That's good.

Dr. Ostrow: Okay. So I assume you'll do something similar like you did to the Site Profile issues, that you'll mark up what we send however you like, send it back to us, and we'll work with you guys to actually post it.

Mr. Cardarelli: Yes.

Dr. Ostrow: Okay. Good.

Member Beach: And then can you let us know when that's done?

Dr. Ostrow: Yes, sure.

Mr. Cardarelli: Yes, we can.

Member Beach: Thanks.

Dr. Roberts: Thank you. Anything else?

(No response.)

Follow-up Actions

Dr. Roberts: Okay. Great. So, in terms of action

items, I just want to make sure we know what needs to be done.

So, obviously, DCAS is going to gather the information on the interviews and put that together. And we'll be sending unredacted versions both to CDC accounts, and if that's not acceptable to people, mail them to them.

It seems like another thing that needs to be done is that NIOSH needs to respond to the SC&A report on the Burial Grounds -- I forget the action item. Let me try to get back to the exact. We need to develop a response, just to be accurate, yeah, to SC&A's report -- SC&A's review of NIOSH's response to the SC&A TR-2017-007 draft review of NIOSH's report for SEC-219 for INL.

Member Beach: I think it's the May report.

Dr. Roberts: Yes, the May report. Okay.

Dr. Taulbee: Right. What we're going to be responding to is why we believe the 18 workers are representative and bounding. That was brought up with for co-exposure model.

Dr. Roberts: Right.

Member Beach: So that's in addition to a response to the May report, right?

Dr. Roberts: Yes. That's my understanding. Okay. So we have that.

That we need to schedule a Work Group in the future to talk about what the remaining areas of disagreement are. That will need to be scheduled for some time after August, once the interview data is disseminated to folks.

It also looks like a response from NIOSH is needed to the BRS entries. And there's going to be some interaction with the Work Group Members to put those entries into the BRS, if I'm understanding that correctly.

Dr. Ostrow: Well, I don't think with the Work Group. This is Steve. I think SC&A and NIOSH with that.

Dr. Roberts: Okay. SC&A and NIOSH. Okay. And then do we need an SC&A review -- SC&A was tasked with reviewing the work that NIOSH put together on the reactors. Is that correct?

Dr. Taulbee: Yes. That would be RPRT-0099.

Dr. Roberts: RPRT-0099. Okay. Perfect. Thank you for helping me with that. Am I missing anything?

Dr. Ostrow: This is Steve. Longer term, NIOSH, I heard, is continuing work on the reactor characterization studies, like the Report-0099 but for the other reactors that we identified.

Dr. Roberts: Okay.

Dr. Taulbee: Yes. This is Tim. That is ongoing work. And the modeling is done for several more of those reactors. It's the number crunching that is currently ongoing with that. So, there will be additional reports associated with that effort.

Dr. Roberts: Okay.

Chair Schofield: You're going to be doing that after you retire.

(Laughter.)

(Simultaneous speaking.)

Dr. Roberts: It sounds like we want to do a brief update -- sorry. Can you hear me?

(Simultaneous speaking.)

Dr. Roberts: Go ahead.

Member Beach: Oh, I was going to say, I didn't know if there would be a report out from SC&A and/or NIOSH on that for the full Board or if just Phil is going to do it.

Chair Schofield: I think we can just do it. I mean, there's not a lot to report out on. I think today went pretty well.

Dr. Roberts: It sounds like that would be a pretty straightforward and maybe even a fairly brief update to the full Board. So, Phil, you said that you would cover that?

Chair Schofield: Yeah. And I'll send it to you for review.

Dr. Roberts: Great. Okay. Any other action items?

(No response.)

Dr. Roberts: Okay. Any other comments before we adjourn the meeting?

(No response.).

Adjourn

Dr. Roberts: Okay. Well, hearing none, thank you for your hard work. This has been quite a marathon meeting. I think a lot got discussed, a lot got done. So, thank you so much for engagement, and we will be in touch.

Chair Schofield: Okay. Thank you.

Dr. Roberts: Thank you.

(Whereupon, the above-entitled matter went off the record at 3:47 p.m.)