Centers for Disease Control
National Institute for Occupational Safety and Health
Advisory Board on Radiation and Worker Health
141st Meeting
Thursday, August 19, 2021

The meeting convened at 1:00 p.m., Eastern Time, via video teleconference, Henry Anderson, Chair, presiding.

Members Present:

Henry Anderson, Chair
Josie Beach, Member
Bradley P. Clawson, Member
R. William Field, Member
David Kotelchuck, Member
Genevieve S. Roessler, Member
Phillip Schofield, Member
Loretta R. Valerio, Member
Paul L. Ziemer, Member

Registered and/or Public Comment Participants:

Roberts, Rashaun, Designated Federal Official
Adams, Nancy, NIOSH Contractor
Barrie, Terrie, ANWAG
Barton, Bob, SC&A
Buchanan, Ron, SC&A
Calhoun, Grady, DCAS
Cardarelli, John, DCAS
Carroll, Stephanie, Atomic Worker Advocacy, Inc.
Chalmers, Nancy, ORAU Team
Cook, Maddie, DCAS
Fitzgerald, Joe, SC&A
Gheen, Angelica, DCAS
Gogliotti, Rose, SC&A
Guido, Joe, ORAU Team
Hicks, Steve
Hughes, Lara, DCAS
Lewis, Greg, DOE
McCloskey, Pat, ORAU Team
Mercer, Jack
Naylor, Jenny, HHS OGC
Nelson, Chuck, DCAS
Quinn, Trish, CPWR
Rutherford, LaVon, DCAS
Sharfi, Mutty, ORAU Team
Sheanshang, Daniel, ORAU Team
Taulbee, Tim, DCAS

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(1:00 p.m.)

Welcome

Dr. Roberts: Okay. My clock says 1:00 p.m. Eastern, so I'll officially open the meeting.

Good afternoon and welcome, everybody. I'm Rashaun Roberts, I'm the DFO for the Advisory Board on Radiation and Worker Health, and welcome again to the second and final half day of Board Meeting 141.

Like yesterday, we'll just go over a few preliminary items.

If you are participating by telephone line only, know that all of the materials for today, including the meeting agenda, presentations, and other documents are all posted on the NIOSH website for this program under scheduled meetings for August 2021.

You can go there and find and follow along with all the presentations and materials, and just for your information, the materials were provided to the Board members and to other staff prior to the meeting.

If you take a look at the agenda for today, or the agenda on the website, there's a Zoom link which will enable you to hear, speak, and watch the presentation through Zoom.

If you are on Zoom, you want to be muted at all times when you're not speaking, and the mute for Zoom is near the bottom left-hand corner of your screen, if you hover over it.

And I'm hearing that someone's off mute.

If you're participating by phone, I ask that each of you please mute the phone, of course unless you're speaking.

If you don't have the mute button, press *6 to mute. If you need to take yourself off, press *6 again.

Also, because we may be unable to see you for the meeting, please identify yourself before your comments or questions.

So now we just need to address conflict of interests for the Board for today's agenda.

And as you can see for the session for today, there will be presentation and discussion of the Y-12 and Oak Ridge National Laboratory, their X-10 site.

Dr. Jim Lockey has a conflict of interest for both sites, but I don't believe he's going to be joining the meeting today, so this is moot.

Dr. Paul Ziemer is conflicted for the X-10 site, so Paul, when we come to that item in the agenda, please disconnect from Zoom, and your telephone line, if you're on it.

And I don't think we'll have to be concerned with coming back to the meeting, as X-10 is really the last agenda item.

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

(Roll call.)

Dr. Roberts: Okay, I'm not hearing anyone else, so again thank you. And welcome again, and let's go ahead and prepare to move further into the agenda.

Again, please periodically check your phone or check Zoom and make sure that you're on mute, unless you're speaking.

So with that, I will turn the agenda over to Dr. Henry Anderson, who's our board chair. Henry?

Chair Anderson: Thank you very much. Thanks a lot,

Rashaun.

I think first off is Chuck to give us an update on SEC petition status.

SEC Petitions Status Update

Mr. Nelson: Okay, I will sure do that. Let me try to share my screen here. Let me know when you can see it, please.

Chair Anderson: Yep, we got it.

Mr. Nelson: Okay. Let me get started here.

My name is Chuck Nelson. I'm going to be doing the SEC update. We do this every Advisory Board meeting.

So moving down here, if I can get this thing to move. There it goes.

Okay, we do this update at every Advisory Board meeting to give the petitioners, public, and Advisory Board an update of the petitions and qualifications under evaluation.

In addition, this update provides evaluations currently under review with the Advisory Board, as well as any 83.14s, which are NIOSH-initiated petitions.

And this update can help the Advisory Board members prepare and plan for future Advisory Board and Work Group meetings.

Okay, today we have 258 petition submittals. We currently have no petitions that are in the qualification process.

We do have two petitions in the evaluation process, and that is Pinellas and Lawrence Livermore.

We'll touch on these two evaluations in the next two slides.

And currently we have 11 SEC petitions that are

under review and with the Advisory Board.

Okay. So, NIOSH is currently evaluating the Pinellas Plant in Clearwater, Florida, for the time period of 1957 to 1990. This is SEC-00256, and this evaluation includes all employees.

NIOSH is currently expected to complete the evaluation in September of 2021, so that would be next month, and we also plan to present this evaluation report in the December Advisory Board meeting.

The second SEC petition under evaluation is the Lawrence Livermore National Lab. That's in Livermore, California.

The current time frame under evaluation is 1990 to 1995, which covers the remaining years of the SEC Petition 221.

Now this was a reserved period, so this will be an addendum to SEC 221 Evaluation Report.

We have a need to get to the site to complete a data capture and perform some interviews to address some of the issues that are outstanding.

However, due to the ongoing COVID pandemic, we've been unable to get to the site.

So this time we have a placeholder completion date of December 2021.

Okay, next we have SEC petitions under Advisory Board review. We'll start with Hanford, that's SEC-00057.

All the SEC issues are closed except those related to the current ongoing co-exposure modeling effort.

So that's going well, and we're in pretty good need of that right now. Next is Savannah River, SEC-00103.

As many of you are aware, a new SEC class was

recommended by the Advisory Board for SRS, and as Grady mentioned yesterday, we're currently awaiting action from the HHS secretary. So, that should be coming here soon. There are still some remaining issues open with SEC-00103, so the Advisory Board has not closed out this SEC.

Next up is Los Alamos National Lab. That's SEC-00109.

NIOSH is working to resolve issues raised by SC&A.

That's Sanford Cohen & Associates and the Work Group, and we are expecting to send two reports to the LANL Work Group in late September or early October for this effort.

I think Bomber touched a little bit on that yesterday.

And then we have Sandia National Lab. That's SEC-0188.

NIOSH completed response to SC&A's review of Sandia Addendum 2 this past June of 2021.

Okay, up next we have Idaho National Lab. That's SEC-0219. And again, we're working on issues raised by SC&A raised in the Work Group.

And issues that currently are being worked on is reactor reviews and looking at OTIB-0054, to see if it provides an adequate bounding approach for internal doses, and NIOSH is also working on responses to the Work Group and SC&A on the burial grounds.

Moving on to Argonne National Lab West, that's SEC-0224.

Again, we're working on issues, and specifically looking at the use of general area air sampling for internal does assessments.

That's related to RPRT-097. We have a new report that will be specific to this site, it'll be RPRT-089.

Moving on, Area IV Santa Susana. At this time, we're

still waiting on records to be released from our record center here in Cincinnati.

We're developing a response paper to issues raised by the Work Group, and to complete this, a data capture for BZ air data is needed.

In addition to that, NIOSH is working on developing an approach for assignment of dose for americium and thorium during the remediation period.

And again, we're experiencing some delays in data capture due to the pandemic.

Next step is Metals and Controls, SEC-0236. NIOSH is working to resolve issues by SC&A and the Work Group.

Of note, there was an interview discussing the Mound site dust-loading study. And this was recently finalized, and I believe it was provided to the Work Group.

Correct me if I'm wrong there, LaVon. I also understand SC&A is currently performing final reviews of dose reconstruction methods for Metals and Controls.

Mr. Rutherford: Chuck, this is LaVon. The interview was not provided to them but will be sent to them today.

Mr. Nelson: Okay. All right. Well, I'm glad I asked. Thanks for that clarification, LaVon.

Okay. Moving on. De Soto Avenue Facility is SEC-0246, and NIOSH is working on providing some clarifications on a few remaining issues.

Dr. Lara Hughes, who will be up next presenting the Y-12 addendum, is working on a -- developing a response paper to address those issues raised in the Work Group discussions, and in addition, she needs to do some more, or we need to do some more data capture to resolve some questions about the mass spec lab operations.

And again, we are currently waiting on the record center here in Cincinnati to release some information for us.

Moving on to Y-12, that's SEC-0250.

Following this presentation, Dr. Hughes will be presenting an addendum to the evaluation report, so I won't go into detail on that.

And finally, we have Reduction Pilot Plant. That's SEC-0253.

NIOSH did provide some responses to the Work Group in May of 2021, so a couple months ago, regarding a couple observations.

I know it was discussed back in the April Advisory Board meeting that the remaining issues would probably be moved to another established Work Group.

I think it might have been TBD-6001 Uranium Refinery AWE Work Group, and you know, the remaining issues are Site Profile issues, so that's what the discussion was on that.

And finally, just provided a summary of sites with evaluation periods awaiting actions with their corresponding time period.

So the next few slides will be on Hanford '84 to '90, Savannah River Site '72 to 2007, Los Alamos National Lab, '96 to 2005, Sandia National Lab 1997 to 2011, and Idaho National Lab 1949 to 1970, Argonne National Lab West is 1958 to 1979, and Area IV of Santa Susana is 1991 to 1993, and we have Metals and Controls for the residual period of 1968 to 1997, De Soto Avenue 1965 to 1995, and Y-12 is 1987 to 1994.

Then Reduction Pilot Plant is 1976 to 1978.

Now, the potential 83.14 SECs include the West Valley Demonstration Project. There was an SEC class already added for this, but this time we're

evaluating data from 1966 to 1968.

The evaluation process is still underway, and we had quite a large number of documents that were received from the data capture, and that review is not yet completed, so the review is still ongoing.

And that's it for the SEC update. Are there any questions?

Chair Anderson: If there are no questions, thank you very much, and shall we move on to Bill? Want to take over for Y-12?

Member Kotelchuck: Bill?

Mr. Taulbee: If you're speaking, Bill, we can't hear you.

Chair Anderson: Yeah.

Y-12 SEC Petition #250 Addendum Update (Oak Ridge, Tennessee; 1987- 1994)

Member Field: That's funny, I hit it once and it went back to mute, but okay, sorry about that. My ventriloquism, I guess, practice. So, our main thing I think we're going to discuss today is Lara is going to give us a report. This is sort of a background.

The folks on the Y-12 Committee are Clawson, Roessler, and Valerio.

And we have this addendum, which come out a little over a month ago that the committee hasn't met yet to discuss.

We thought we would hear about in this meeting and decide whether or not -- or not whether or not, but when our next subgroup or Work Group meeting would be.

The other thing that NIOSH should provide to the Work Group and to the petitioners was the response to comments, so there was about a 39 page response that included the questions from the petitioners that

was provided June 29 of 2021.

So, those are the major activities, but we haven't met as a Work Group -- I think we last met September 24, 2020.

So the information that we're hearing today will be the latest we have, so the Work Group will be hearing this for the first time since we haven't met since last September.

So Lara, I'll turn it over to you for the presentation.

Dr. Hughes: Okay, thank you, Dr. Field.

So, you had asked for a Work Group update. Would you like that first? I don't have any slides for that, but --

Member Field: That's fine.

Dr. Hughes: I mean, you kind of summarized it, and that -- since that -- the last Work Group meeting was in September 2020, at which point NIOSH presented an update of the status of all Y-12 activities to work on the SEC 250 addendum, the SEC 250 evaluation report, and the SC&A review of that.

There's also some co-exposure modeling efforts going on and the review of the Y-12 issues matrix, and the post evaluation report submission by the petitioner, so that was all discussed.

And during the meeting, NIOSH was tasked to provide a formal response to items submitted by the petitioner.

This was a paper, as well as a presentation, and then NIOSH prepared a response paper to those items submitted by the petitioner, and that was sent to the Work Group July 21 of 2021, and it's dated June 29. We're kind of looking at a lengthy approval process right now due to our computer issues.

So, and as you said, the Work Group has not met since then, so this paper, I assume, will be discussed.

Member Field: Okay.

Dr. Hughes: Before the Work Group at some point in the near future.

Member Field: Yeah. Yep.

Dr. Hughes: Okay, let me try to share my screen here. All right. Okay. Okay, so my Zoom just went. Hold on. Do you see a full presentation screen? Hold on.

(Pause.)

Dr. Hughes: Do you see the full presentation or do you see the presenter notes?

(Simultaneous speaking.)

Dr. Hughes: Okay, good. I can never figure out which. Like, it tells me which one is which, but it doesn't always work.

Okay. So, thank you, Dr. Field, Dr. Anderson.

This is the NIOSH presentation of the Y-12 evaluation report addendum for petition 250.

I'm Lara Hughes. I'm with NIOSH. I'm a health physicist.

I did not do this work alone. A lot of this work was done by our contractor, the ORAU Team, especially Joe Guido, who did a lot of work on this, so I'd like to acknowledge the help of this team, the Y-12 Evaluation Team that did most of this work. I'm mostly presenting (audio interference) when it's all finished.

So, this is a little bit of the Y-12 -- sorry, I'm having some screen issues here.

This is an overview slide of the SEC history for Y-12, so there are seven previous SEC classes that added a class to SEC.

So the last one was -- actually no, not the last one,

but the ones shaded in gray are the ones that are completed.

The last one was SEC-00251 that added a class for 1958 to 1976, and this was related to an infeasibility to reconstruct doses from thorium and plutonium-241.

So, including SEC-00256, we look at the SEC class up until 1976 at Y-12.

The currently active SEC petition is SEC-00250, and this was evaluated in 2019, exactly two years ago this was presented.

And in this petition NIOSH recommended a class to be added to the SEC from 1977 to the end of July of 1979, and also did not recommend a class for the period of August 1979 through 1986. The class was recommended due to infeasibility to reconstruct doses from thorium, and the period where there's no classes recommended, it was determined that the thorium data that was available was sufficient to bound the dose for that period,.

And also, in this petition, we reserved a period from 1987 through 1994, and this was because we had not, at that point, collected, or were able to collect all the data from Y-12, and evaluated it.

So, and this is the reason we're here today.

This is the addendum to the SEC-00250 petition evaluation, and this is for the period 1987 through 1994.

And at this point, NIOSH does not recommend a class to be added to the SEC based upon this evaluation.

A little bit of background of the petition, SEC-00250. This was received in November 2018.

The proposed class was all workers who worked in any area of Y-12 where uranium was fabricated or processed from January 1, 1980 through December 31, 2000.

NIOSH reviewed all the material that was submitted with the petition, and also NIOSH reviewed previous documentation issues related to the dose reconstruction at the site, and finally qualified a class that encompassed all employees who worked at the Y-12 plant from January 1, 1977 through December 31, 1994.

And the reason these dates were chosen over the ones that were petitioned was that the previous SEC, SEC-00251, had ended at the end of 1976, and since the SEC-00251 was added because of the thorium infeasibility.

NIOSH felt that we should continue to evaluate the feasibility of the thorium because of the issues that persisted before that.

And the cutoff in 1994 was because the plant was placed in a stand-down mode in September of 1994, and that kind of presented the end of routine processing operations at Y-12.

NIOSH did not recommend to add a class to the SEC from August 1, 1979 through December 1, 1986, and that was because doses can be reconstructed with the available data, and that is outlined in the SEC-00250 evaluation report. This was presented two years ago.

The current report that we're talking about is the addendum to the SEC-00250 evaluation report, and that is again, January 1, 1987 through December 31, 1994, during which thorium doses can be reconstructed with the available data.

This is a little overview of the Y-12 claim numbers as of January 2021. We have about 6,869 total numbers of claims. This number will be a little higher by now, but this is the last time I had actually pulled the data, and as you know, I can't really get to the total stats at this point, so this is a little dated.

So, we have workers that worked during this period that's the subject of this addendum, 2,763, and we

completed about 2,600 dose reconstruction during this period.

And again, or of a little greater interest is the number of people who have internal dosimetry records for this evaluation period, is about 1,341, so about 49 percent, and I think it was about 86 percent of those workers have external dosimetry records with this evaluation period.

Sources of available information that we looked at, we collected more data from Y-12.

We also took a data capture trip to the DOE operations center in Germantown. That was done December 2019, that was right before COVID shut everything down. We added about 500 documents to the Site Research Database, just general data capture-related item or internal dosimetry related items, other items, as well.

We looked at electronic databases and we did additional interviews, so 23 interviews with former Y-12 employees were reviewed.

Six of those had already been done before, and those were done in the course of the evaluation of SEC-00251.

And four additional interviews were done, were specifically targeted by NIOSH towards workers who worked at the Y-12 or K-25 in vivo facility.

So, four of those, four interviews were done.

And then in addition to that, the petitioners contacted NIOSH with a suggestion of names or a list of names of former Y-12 workers who wanted to share their work experience, so we did 13 additional interviews with former Y-12 workers based on the suggestion of the petitioners.

As you know, we review any available data that might help us evaluate scientific publications, and of course existing claimant files.

A little bit of Y-12 history. So this is my slide. I have one every year for these presentations.

The site is about 811 acres, .67, so a little over a half a mile wide, 3.2 miles long.

Peak employment was 22,000 workers at the roughly down to 5,700 by 1998, so probably a little more than that during the current evaluation period.

And the EEOICPA covered period is 1942 to the present.

Generally the site history, we kind of divided it into three eras or time periods where operations changed.

The first era until 1946, Y-12 mainly conducted uranium isotope separations using calutrons for uranium enrichment, and the second era -- and this is where we are with this addendum -- until roughly 1994, they manufactured Cold War nuclear weapons components.

They produce and test key components of nuclear weapons, stockpiling highly enriched uranium, and the technology development for new weapons designs.

And the third era after 1994 consisted of multiple new missions, such as storing highly enriched uranium, environmental and waste management operations, and continued weapons part production on a smaller scale.

So let's talk a little bit about the thorium parts production piece.

Thorium metal parts were produced to be used in nuclear weapons, and the main process that was used to create thorium metal components was a process called arc melting, and this started in 1959.

They used thorium pellets that were pressed into electrodes that were then arc melted into ingots. Ingots are like chunks of metal.

And those ingots were press-rolled machines, scrap recycled depending on the need of the program.

During this arc melting, which involves heating the metal up and melting it, the radium and other thorium progeny are volatilized and get into the air and are potentially available for inhalation.

So this was the major thorium processing, and also the process that posed the highest exposure potential, and that ended in the mid-1970s.

And all thorium arc melting ended in 1994.

There were some smaller projects related to parts refurbishment and small scale special project until 1999, but this did not involve arc melting.

The entire Y-12 plan was in a stand-down mode from 1994 through 1998, and all special project ended in 1999 after a depleted uranium incident with an arc melter, so that was the end of all arc melting.

However, the thorium arc melting already ended in 1994.

The buildings. There were seven buildings where thorium was processed. They are listed here, and also two buildings where thorium was stored.

This is the data that we collected from the DOE facility in Germantown. That's the thorium inventory data for the addendum period, 1986 through 1995, so we added a year there.

And you can see that the inventory is relatively consistent over this period, and then we have a bit of a jump here in 1995, but some additional research showed that this increase really was due to what they called weapons awaiting disassembly, which consists of storage operations.

Regarding the thorium exposure potential, thorium is the beginning of a decay series which contains multiple radionuclides.

So, the number of separations that are done to the metal before this process affects the total dose potential because it affects the number of decay products that are in the metal.

The radionuclides that are of particular concern regarding internal dosimetry on thorium-232, thorium-228, and radium-228.

The arc melting is the thorium process of most concern, as I mentioned, because of airborne contamination and the disruption of the thorium decay chain.

Especially the radium that is contained in the metal is vaporized and released into the air because of its lower boiling point.

And also, the ingots from the arc melting has a radium enriched outer layer, which again, once this goes into like a pressing or machine process, it can again cause volatilization of the material.

So let's talk about the internal thorium dose data that is available for this period.

In general, Y-12 lung counts exist for 1959 through 1994, and actually past 1994, but that was not part of the evaluation.

For the beginning period where thorium data is available, these results are available in units of mass, milligrams of thorium in the lung in these reports, and we have not been able to find any information how this was derived from the counting data.

So, in using the in vivo lung counter, and they -- of counting data, but the in vivo reports only list milligrams.

And if we don't have the actual counting data, we cannot use it to count the dose.

To bound the dose, we need thorium results that contained the progeny activity of the thorium decay chain, and those data is available starting in August

1979 to 1994.

So for the current period, NIOSH has obtained usable thorium in vivo count data for 1987 to 1994 from three systems.

The first system is the sodium iodide detector at the Y-12 in vivo facility from 1987 to the end of 1990.

The second one is the low energy germanium detector at K-25, and that was used from 1992 to 1994.

And also the low energy germanium detector at Y-12 from 1992 to the end of 1994.

And as you can see here, so you have one detector at Y-12, then K-25, and then Y-12 again, and what happened was that Y-12 was updating their facility there, in vivo counting facility, so they got rid of the sodium iodide detector and installed the low energy germanium system, and in the meantime, workers that needed to be in vivo counted went over to K-25.

So these are the thorium records that we showed in the SEC-00250 evaluation report.

Again, we're looking from '79 to 1986, a total of about 1,000 actinium measurements.

These are the thorium decay chain radionuclides that are needed to bound the thorium dose.

And this is what we have for the current addendum.

We have the Y-12 sodium iodide detector lung counts on the left column here, a total of about 3,460, or 3,459 to be precise -- data points, then about 200 data points for the K-25 lung counter, and then another 2,200 data points for the low energy germanium lung counts of Y-12 in the left column. So we have a fairly respectable number of thorium counts here.

So, one reason this evaluation took a little while is because the data pedigree evaluation.

This is something that is done, this is standard process for all SEC evaluations.

In this case, we needed to do some additional research, so generally data pedigree looks at how consistent the methods are and whether or not different data sources match, things like that.

So, in the case of the Y-12 data, we have data stored in two separate data repositories for this evaluation period, and one is the Delta View Imaging System, which contains scans of raw data reports.

These are the printouts that they have from the system, or even handwritten filled in sheets that we used to record counting data.

This is also what we would see for individual claims responses.

And then we also have the Electronic Record System, which is a database where these counting results are tabulated and recorded, and when Y-12 sent this to us for evaluation, this would be in the form of just like an Excel spreadsheet.

So when those two sources were compared, there were some discrepancies, there were some 838 records missing in this electronic database when compared to the Delta View system. And those were mostly from the 7000 to 9000 series departments.

So, we felt like we needed to contact Y-12 for some clarification.

And then, Y-12 provided an updated ERS file based on updated search criteria because it turned out that the search criteria that we used to extract from the database was a little too restrictive, and we had not been aware of that.

So once that had all been sorted out, Y-12 provided another 568 data points in the updated file, and also declared that 132 of those were declared invalid measurements. And there were some 128 were not

in the ERS because of a data migration error. However, they pointed out that we have a copy of the Delta View imaging file, which is the copy of record, and that's also what we receive for NOCTS claims.

And so, we found that the pedigree issues were satisfactorily resolved, and that the data is of sufficient quality to use in bounding the thorium dose.

So, since we're saying that we can bound the dose for thorium dose reconstruction, the approach that we're using is that thorium doses can be bounded using the gamma spectral data from the in vivo count for actinium-228 and lead-212.

Those are both nuclides in the thorium decay chain.

To do this, NIOSH developed OTIB-0076 in 2014, which details how this dose reconstruction is done using these decay chain nuclides to calculate intakes for thorium, and in a nutshell, the lead-212 result I used to estimate intakes of thorium-232 and thorium-228, and the actinium-228 results I used to estimate intakes of radium-228.

And then those intakes are used to assign internal doses from thorium using the available software.

Specifically for this addendum period for Y-12, the results from the sodium iodide in vivo facility from 1987 to 1991, those doses can be bounded using established procedures, as explained in OTIB-0076 and also the SEC-00250 Evaluation Report.

The thorium results from the K-25 facility, we're looking at a period from January to May 1992, can actually not be used because they have no actinium-228 or lead-212 reported.

Those results are reported in nanocuries of thorium, I believe.

So at this point we cannot use it unless we find the extra count data, which we have not located yet.

The thorium results from the Y-12 low energy germanium in vivo facility after they switched over from the sodium iodide detector, starting in June '92 to the end of 1994.

Those results only contained the actinium-228 results.

So, this kind of threw a wrench into things when we were evaluating this, but then we determined that the doses can be bounded using available chest wall thickness data, as outlined in DCAS-RPRT-008.

So this is another reason, this evaluation took a while.

We developed DCAS-RPRT-008 to address this issue of how to do thorium dose reconstruction, to bound the thorium dose for Y-12 during this period, when only actinium-228 measurements are available.

Now, these records are very detailed. We have spectral data, so channel data counts per energy are listed on these Delta View scans, so it was actually possible to take the spectral data of the -- not only the lead-212 because that's not available, but the other gamma energies, and to derive the detection efficiency in the region of the lead-212 PMI region.

Using that, and also deriving the background in this, the lead-212 energy region, it was possible to direct the MDA for lead-212, even though it was not reported on the counting data.

And since the MDA for lead-212 for the detection efficiency, rather all of these data, or all of these results are a function of the chest wall thickness measurement. And if you think about it, it kind of makes sense. The thicker a person's chest wall, the lower your detection efficiency will be to detect the gamma in the lung.

So, we actually managed to derive the MDA as a function of the chest wall thickness, and that can then be used as an upper bound to bound the dose, which

would then be applied as a triangular distribution, and this would be assigned in a similar manner or in the same manner as the prior data using OTIB-0076, and I'd like to point out that the DCAS-RPRT, the analysis for DCAS-RPRT-008 was done by Dr. Neton, our former associate director of science who was also an expert in in vivo counting.

So in summary, available monitoring records are sufficient to complete internal thorium dose reconstruction for the proposed class of employees from January 1, 1987 through December 31, 1994.

So, from 1987 through the end of 1991, we used available actinium and lead-212 data to bound the dose using the methods described in OTIB-0076.

June '92 to December of '94, we used the available actinium-228 data and the chest wall thickness information as outlined in DCAS-RPRT-008, and the data from the K-25 in vivo counter at this point is not used. However, this period we feel can be interpolated by the existing co-exposure data on either side of this very short period.

And that is the end of this presentation, the internal thorium feasibility.

NIOSH determined that the dose reconstruction is feasible for internal thorium for the addendum of SEC-00250.

And that concludes my presentation, and I'll be happy to answer any questions.

Member Field: Thank you, Lara. So, Henry, at this point, do you want to get questions from board members?

And I think we have time for petitioner comments, as well.

Chair Anderson: Right, yeah.

Member Schofield: Hey Lara, this is Phil. I've got a question.

On the cards of microfiche, whichever you have, do they actually measure the chest wall thickness every time they take a measurement, or not?

Dr. Hughes: The chest wall thickness is reported on the record, yes.

Member Schofield: Okay, thanks.

Member Roessler: Lara, this is Gen. I'm trying to sort through all of this. You got the actinium-228 results and you have them electronically, I assume?

You said you didn't have results for thorium, but do you have the lead-212 results electronically?

Dr. Hughes: We have the lead-212 results for the period from '87 to 1991, yes. And then for the period '92 to '94, we derived the lead-212 value MDA from the existing spectral data.

Member Roessler: Okay, so you're getting it from the spectral data, but is that data available electronically, or how do you get it?

Dr. Hughes: It's a scan from a printout, but the channel data is available, so it's printed and scanned, but it's available, and, well, I'd be happy to send you the SRDB, our Site Research Database link.

It's a very large PDF file really, and that has gone through optical character recognition so we could search for channel information and do an analysis that way. It is detailed in DCAS-RPRT-008, and it's a somewhat complex analysis.

And I'm afraid I probably didn't do a very good job making it very clear. It's kind of complex.

Member Roessler: Okay, so it's --

Dr. Hughes: Sorry.

Member Roessler: Go ahead.

Dr. Hughes: No, I said, it's something that we

definitely could discuss in the Work Group if that is desired, or I could, you know, present it in a more detailed manner.

Member Roessler: I was just wondering how much work was involved in extracting all that information?

Dr. Hughes: It was somewhat labor intensive. I didn't do it, it was Dr. Neton who did it, but I'm not sure how much time was spent on it.

Member Roessler: Okay, thank you.

Member Ziemer: I have one question, Lara. This is Paul Ziemer.

The slides indicated there has been something like 2,600 dose reconstructions completed for this time period already.

Was all of this data available when those were done, or is this newer captured data?

Dr. Hughes: Well, it's my understanding that the data was available because you know, when we do these SEC analyses, and we're kind of keeping an eye on the potential co-exposure model, we kind of want to collect the entirety of the available data.

But since the Delta View system, that has been around, and that is Y-12, those records or any claim that is filed, it is my understanding that an extract of that will be sent to NIOSH for dose reconstruction.

Member Ziemer: Thank you.

Member Beach: Lara, this is Josie. I have a question for you on that new report, the DCAS-008.

I know that's a fairly new report. I think it was written or released in April of last year.

Has that been reviewed at all by SC&A, or is it on SC&A's radar at all to review that? Dr. Hughes: I'm not aware that it was reviewed by SC&A and I'm not sure.

It has not been discussed in detail before the Work Group.

It's probably on SC&A's radar, I would presume, but I do not think they have been tasked. They --

(Simultaneous speaking.)

Mr. Barton: Yeah, this is Bob. Yeah, we haven't done a formal review of that paper.

It seems like it's really directly tied to this SEC review that we're kind of discussing for the first time today, so I think that's certainly something that would have to be part of the Work Group discussions going forward, as it sounds like a very novel method.

But it does make sense. On the surface, I think it certainly needs to be looked at and due diligence performed.

But, you know, thorium is not a new topic in the SEC world under this program, and a lot of discussions have already occurred about how we can measure thorium with the in vivo systems that were developed in Y-12 and used at numerous other sites.

But there is certainly a lot to unpack here, and I think this RPTP-008 would probably be a good thing to include as part of the Work Group review.

Member Beach: Yeah, and I'm curious if you should wait -- and I guess this would be directed at you, Bill -- if you should wait for a Work Group call to task that, but I'll leave that of course to your expertise.

So that report, it seems to me like it would've been part of the SEC without that report for the thorium.

The thorium's up until then, and you developed that report, take care of the thorium. Is that correct?

Dr. Hughes: Well, I can't really answer to that. I mean, this is the way --

(Simultaneous speaking.)

Dr. Hughes: Oh. Sorry, please go ahead.

Member Beach: No, I said that was probably too base of a question, as it's quite a huge topic, so sorry about that. I'll let you go ahead.

Member Field: Any other questions?

Member Clawson CLAWSON: Yeah, I do, Lara. This is Brad. You're looking at the thorium, and you have the thorium inventory.

Can you explain to me, do you know how much thorium was processed through the facility per year?

Dr. Hughes: I do not have that data at this point.

Member Clawson: Okay, because now this is covering all aspects of this thorium process, not just the strike arc, or whatever this was called.

This is the machining of the parts, and everything else like that that people were covered, correct?

Dr. Hughes: Yeah, so during the addendum period, really what we're looking at is what they call parts refurbishment.

It's not so much the arc melting, as taking in existing parts, and I'm not exactly sure what the process is.

A lot of this is classified. It's taking things apart and ---

Member Clawson: Refurbishing them?

Dr. Hughes: Refurbishing them, yes.

Member Clawson: Yep, okay, I understand. That's what I was wondering.

So this inventory that you have here is of parts and raw material, or is it just thorium to put into the process?

Dr. Hughes: No, my understanding is that that is the thorium inventory at the time, everything.

Member Clawson: Okay. Thank you.

Dr. Hughes: So please correct me if I'm wrong on this one. That's the ending of it.

Member Field: Lara, this is Bill. I know we're looking up through '94 for what's been presented as far as lung counts, but with that high inventory in '95, were there lung counts from '95?

Dr. Hughes: Yes, there are, I believe.

Member Field: Okay.

Dr. Hughes: We did not evaluate it, but I mean, they did not stop doing lung counts. I mean, going into the modern era, they might have modified, you know, some things like who was counted and when, but there definitely are lung counts.

Member Field: Right, I assumed so, I just had to ask. Any other questions?

Mr. Fitzgerald: This is Joe.

Member Clawson: Hey, Bill, I have a question for you. Who's all on the Y-12 Work Group?

(Simultaneous speaking.)

Member Field: Yeah, so it's Clawson, Roessler, and Valerio.

Member Clawson: Okay, that's what I wanted to make sure, because I wasn't sure there, so. Okay, thank you.

Member Field: Yep. So I think -- you know, this is my opinion.

You know, obviously we haven't had a Work Group meeting, but I think because of the complexity of the analysis, I think it would be worthwhile to task SC&A now, unless you think there'd be some benefit to specify what the tasking would be based on Work Group discussion.

Member Clawson: I think that we should get SC&A started on this now, especially with this report that just came out, give them time to be able to review that process and go into this.

Member Field: Because I can imagine a Work Group meeting would be helpful for us to know SC&A's view as we discuss some of these issues.

Member Clawson: Exactly. Instead of going into it and bringing up a bunch, they may be able to satisfy some of our questions in their review.

Bob, I guess that'd be the question that I'd ask to you, is what would you need formally to start into this?

Mr. Barton: Well, it's certainly complicated by the access restrictions that are imposed by the cyber security update that's happening. We don't have access to the SRDB.

And if you've noticed, in the report it says NIOSH was able to go out and capture a lot of additional data that we simply don't have access to.

Now, we might be able to do some of that, based on those discussions with Grady yesterday that we may be able to request, you know, specific SRDB references.

But typically when SC&A does a review, we don't just go through the reference list of an SEC report.

You know, we usually have access to do our own searches through all of the captured documents that are out there, so it's difficult for me to speculate on a time frame on what we would need until really we get the SRDB back to be able to do a lot of these types of research. And --

Member Clawson: Well, I really don't see that a Work Group would be beneficial until actually you guys get the SRDB back and are able to have time to be able to process and go through this.

So, I think, Bill, that we've just got to sit back a little bit, but I just want to make sure that SC&A knows that this is on their list of to-do items.

Member Field: Right. I think we agree to your thoughts there.

Member Clawson: So --

Member Beach: Hey Bill, this is Josie again. Has SC&A been tasked to review the addendum report that we just viewed today?

Member Field: No, they haven't.

Member Beach: Okay. So, it would be -- go ahead.

Member Field: It'd be worthwhile to do that, as well.

Member Beach: Yeah. Okay, thanks.

Mr. Barton: Hey, I just would throw out the caution.

You know, we sort of have this, we'll call it the clock once we're tasked with something, and so we really have to get it out in six months, and I'm just a little hesitant being able to commit to that without knowing when we might necessarily get access to all these files that we really want to take a look at to be comfortable sitting down and putting forth any sort of technical position on -- it's complex.

There's a lot to unpack here, so.

Member Field: And what's the timeline for getting that available again? About.

Mr. Barton: I'm not sure anybody knows.

Member Field: No, no?

Mr. Barton: No.

Mr. Calhoun: Yeah. This is Grady, and we think that probably in two or three weeks, we'll be able to get selected documents available.

As far as the actual search tool, I'm not sure about that.

We don't have it available yet for ourselves either, so, if there is a desire to look at it, if it would be worth your while to look at specific, known SRDB references, I think probably in a few weeks we can get that done, and somebody is actually going to be contacting you and showing you how to access that virtual volume when we get that available.

Member Field: So would it be worthwhile then to have a short Work Group meeting and stay a month, or whenever the date is available again, to do the tasking, or we need a Work Group meeting for that?

I guess is what I'm asking, so that the clock doesn't start right away.

Mr. Barton: Well, I mean, I think that's kind of a fluid situation. I don't think we need to necessarily have a Work Group.

I mean, the tasking can be done via email, just so long as it's understood what our restrictions are on bringing this thing to completion.

Member Field: Okay.

Chair Anderson: You have --

Member Field: So Andy, how do you want to proceed?

Chair Anderson: Bob, you have a copy of 08 and these other documents that you could look at and get a sense of how much searching you have to do, rather than just looking at the references, and that might be one way to get a handle on how much time you'll need, and so you can kind of do some pre-work without having been totally tasked with the review.

Rashaun, is that doable?

Mr. Barton: Well, I mean, I think absolutely we can get started, and it is probably a good way to say -- I wanted to qualify that that I'm not quite sure when

we'll be able to finish it just based on the access issues that we have.

Like I said, and as Grady indicated, we can go through it and look at these documents and request certain references that are in the reference list, essentially, so that we can get started taking a look at those, but normally when we do these types of reviews, we don't restrict ourselves to that, and we want to have access to everything that's available, and that's just not quite clear when that will happen.

Member Kotelchuck: Right.

Dr. Roberts: Right.

(Simultaneous speaking.)

Member Kotelchuck: And Dave, I think the Board can authorize, and I would say we should authorize Bill to review and talk with you and decide on behalf of the Board -- we don't have to go through another committee meeting.

We can authorize him to start the tasking when he sees fit after conversations with you, and as you said, we don't need another meeting.

I think the Board itself now is acting as a whole to do this ---

(Simultaneous speaking.)

Dr. Roberts: Can you hear me now? I think I've been having some problems coming up mute.

Member Kotelchuck: Yes.

Dr. Roberts: Okay. So yeah, I think it's fine for Bob to take a look at the -- or whomever at SC&A is going to take a look at, you know, what's been presented here today and kind of see what kind of access is needed, but I do, as Bob was saying, want to caution with when the tasking was actually put forward because like he pointed out, the clock starts ticking.

So we really don't want to put SC&A in a bind if they do not have full access to the documents that they feel they need.

Member Kotelchuck: Okay. Sounds good.

Member Clawson: This is Brad.

And Bill, what I would basically do is just put it into SC&A's hand to notify us when they want the clock to start because they're going to have to see how the process works, how they're able to get through it, and everything else like that.

Would that work with you, Bob? I know that these are unusual circumstances that we're dealing with right now, but my main thing is that I want to be able to get the review of this process going.

Mr. Barton: I certainly appreciate that. There's no reason just to sit on our hands when there is some things that we can absolutely start to look into and get a better idea.

I wanted to caution everybody because of these unusual circumstances, and I think that's a perfectly reasonable path forward.

Member Field: So I'll stay in touch with Bob, and then we'll get that done, but I wanted to thank Lara for all the work that she and her team did for the addendum. You know, it sounds like it was a tremendous amount of work.

And I also want to than Lara for the response to the petitioners, and thank you, the petitioners, for contributing those detailed questions that make it much easier to respond to. I think that's been a lot of work that her and her team's done, and I want to thank you for that, but I also want to make sure we leave time today for the petitioners.

(Simultaneous speaking.)

Chair Anderson: Yeah, let's move there.

Member Field: They can discuss things.

Chair Anderson: I think we have a way forward here.

Just a caution on formal tasking, but we sort of know what the tasking's going to be.

Member Field: Right.

Chair Anderson: It's just that the available materials that go into implementing are not necessarily available yet, so I think you can, Bob, look at what's currently in these reports, get the sense of, you know, what your game plan will be once we get ready to move. All right?

Member Field: Sounds good.

Chair Anderson: So Bill, are any of the petitioners on that want to speak?

Member Field: I don't know, but we'll find out, I guess. Any petitioners for Y-12?

Mr. Hicks HICKS: Yes, this is Steve Hicks.

Chair Anderson: Go ahead.

Mr. Hicks: I got a summary to read to you, a letter.

Okay, I'll start off saying good evening, Dr. Anderson, and members of the Board.

Member Field: Steve, can you spell your last name just so we have it just for the record?

Mr. Hicks: H-I-C-K-S.

Member Field: Right. Okay, thanks.

Mr. Hicks: Okay. And I'm the petitioner for the Y-12 Petition Number 250. Thank you for giving me the opportunity to offer my thoughts on the addendum, and the response to our concerns raised during the Work Group meeting last September.

First, let me tell you how much of a disadvantage the

petitioners are in this process. I'm losing my voice, hold on. We do not have the same access to documents that NIOSH and SC&A have.

Yes, SC&A can review these records at the Board's direction, but they are the Board's contractor, not the petitioners.

I believe in order to be totally transparent and fair, that NIOSH should provide all producers with every declassified document they have used to develop their position, redact it for privacy issues, of course.

NIOSH can start this process early by automatically sending the documents to DOE for review.

As an example, NIOSH states on page 22, it's a response document, that they obtained a list of 2,849 occurrence reporting and process system reports.

And they reviewed 74 of them. The public does not have access to the ORPS database, unless they have a need-to-know.

Well, I think I have a need to know what is in these reports. It's unlikely that DOE will agree.

I have questions about why NIOSH reached the ORPS database, and they said they used this database to determine whether any of the 19 issues outlined in the 1999 DOE memo would affect the ability to reconstruct dose.

For example, would ORPS have reports from Y-12 that admitted that they had inconsistent applications of bioassay requests for similar work activities.

And why did they only look at reports from 1990 to 2019? Is it because ORPS didn't collect this information before 1990? I don't know the answers but would appreciate hearing them.

I have a similar question about NIOSH research and DOE's noncompliance tracking system.

I looked at records from 1996 through 2019, and

identified only one reportable problem, but the problems occurred in 2019, way out of the scope of the proposed plan.

I'd like to understand why they didn't look at the years 1977 through 1994.

NIOSH also contends on page 17 and 18 of the response document that DOE's memo does not impact the validity and availability of the site personnel radiation monitoring records, and that dose reconstruction is feasible.

How do we know that? Is it truly possible that Y-12 did not find any deficiencies during the 120 day suspension?

How far back did Y-12 go when doing these test assessments? Did the test assessments include the years of the proposed plan?

Page 4 through 23 of the 1990 Tiger Team report mentions a previous widespread radiological protection program appraisal probably done in 1989, and it identifies that.

There were problems with radiation records, and a non-routine bioassay program. Did NIOSH research that 1989 assessment?

Did they look for any reports for Y-12 or DOE that summarizes deficiencies during this 120 day suspension?

NIOSH addressed the concerns raised in a White Paper.

I want to comment on their response on the assertion that the test Y-12 used to monitor thorium did not meet ANSI N13.30.

On page 6, NIOSH responded that Y-12 was committed to implementing the standard and did so in May 1992.

That was just two years short of the proposed class,

which ends in 1994. Additionally, further research shows that the draft standard was published according to a LANL document, the Health Physics Society in 1987.

Is this true, then, that Y-12 really was out of compliance? As we contend from at least 1987 until 1982.

And if so, wouldn't this prove that NIOSH is unable to reconstruct dose with sufficient accuracy for these five years?

NIOSH says they have access to nearly 400 bioassay samples, and they had mine.

The reason I submitted this petition is because of the document I have, that I didn't need to be monitored.

Y-12 decided that I, a machinist who carried uranium parts on my chest, didn't need monitoring.

NIOSH admits the assumption that particle size impacts the evaluation of bioassay data, and thus the termination of internal dose, but they don't think it will affect their ability to reconstruct dose.

They've been using the same model for almost ten years. They didn't realize until we pointed it out to them.

They said they will address it during the future meeting.

Is this fair? We found this issue two years ago, and was one piece of evidence used for the petition.

Will the Y-12 petition be dragged out like the SRS petition?

Again, I thank you for your opportunity for the petitioners to offer their perspective and I will provide a written copy of the comments, which will include the links to the documents referred.

And that's the end of my statement.

Member Field: Thank you, Steve. Any other petitioners that would like to talk at this time?

Ms. Barrie: This is Terrie Barrie, and I want to thank Steve for that report, and he will send it off to everyone involved.

I just have a concern about this pause.

This petition is, what, over two years old, or close to two years old, and it's going to be another two or three years old, and I know Mr. Calhoun has been updating the Board, but claimants are in limbo right now, and something really needs to be done.

And so, I appreciate all the Board is doing and the Work Groups and everything, but I just want to keep that in everyone's mind. Thank you.

Member Field: Thank you. Is there anyone else that would like to comment?

Okay. Well, Andy, I guess I'll turn it over to you.

Chair Anderson: Okay. Well, we're ahead of schedule. Rashaun, do you need to wait until 3:15 for Oak Ridge, or could we move into Oak Ridge and end the meeting earlier?

I can't hear you, Rashaun.

Dr. Roberts: Can you hear me now?

Chair Anderson: Yes, I can.

Dr. Roberts: Yeah. I'm not sure why I'm having this kind of trouble.

Now, so my understanding is that we need to start that agenda item about when it's scheduled.

So, obviously we would need a pretty big break.

Chair Anderson: Yeah.

(Simultaneous speaking.)

Mr. Rutherford: Rashaun, this is LaVon Rutherford.

There are no active petitions right now for Oak Ridge National Lab, so there will be no petitioners to listen if that's what you're thinking the holdup should be.

Dr. Roberts: Okay. Well --

Mr. Taulbee: Rashaun, that's exactly what I was going to say as well --

(Simultaneous speaking.)

Mr. Taulbee: Is that we generally only wait when there are petitioners who are online.

Dr. Roberts: Okay. And yeah, this is just an update. So it sounds like we can move forward with it, thanks.

Member Ziemer: If that's the case, I will sign off, Rashaun, and I wish everybody well.

Chair Anderson: Yeah, right.

Dr. Roberts: Yeah. Thank you, Paul. Yes, please go ahead and sign off.

Member Ziemer: This is the first time having a conflict is advantageous.

(Simultaneous speaking.)

Chair Anderson: So, the question would be, do board members want a ten minute or 15 minute break, or should we just move right on to Gen and her Oak Ridge update, and Lara back on to talk?

Member Kotelchuck: I'd say move on.

Chair Anderson: Okay.

(Simultaneous speaking.)

Chair Anderson: So, I'll turn it over to Gen, then.

Member Roessler: Okay, I'm ready to go.

Chair Anderson: Okay.

Member Roessler: Especially since this is the last day and the last item on the agenda, so I think everybody's ready to go. Grady promised me he'd share my slides, and while he's there, it's better if I don't touch the screen.

What I'm going to do is try and make this exciting so that it won't seem like late in the day.

What I'm going to do is do the update on the Oak Ridge National Laboratory X-10 Work Group work.

The Work Group consists of myself as chair, Josie Beach, Bill Field, and Loretta Valerio.

Working on this also -- or no, I shouldn't say also -- doing all the work on this is NIOSH and SC&A.

The NIOSH lead is Dr. Lara Hughes, and Lara, since you're there, why don't you mention the names of your team who's been working on this?

Dr. Hughes: Hey Gen. Yes, absolutely.

So this is again Joe Guido and his team who have been working on the ORNL X-10 report, RPRT-0090, and the responses as well, and there's some, you know, other teams that do the co-exposure and issues matrix items, but they're not of discussion at this point, so.

Member Roessler: Okay, and SC&A, I think the lead's been Bob Barton, and Bob, I know you've had Joe Fitzgerald and Ron Buchanan working with you.

Should I mention any other names?

Mr. Barton: Well, I think technically, Joe Fitzgerald is the lead on this subject, but yeah, those two, and then we have them on the line right now if we need to weigh in, but I think we've seen the presentation and we agree absolutely with the direction that it's headed, and I think we had a very productive meeting, but I'm sure you'll get to all of that as we

get through the presentation.

But Joe Fitzgerald and Ron Buchanan, they're the ones who really deserve the credit.

Member Roessler: Okay, I wanted to mention the names because I no doubt will have to call on you later on.

Well, we'll go to the next slide then. The Work Group, we held our, actually, first meeting in June.

At that meeting, Dr. Hughes gave an overview for us, and she took us back to a September 2012 presentation by Dr. Taulbee.

At that time he was presenting the X-10 SEC-00189 -- which by the way was approved for all X-10 employees for the years 1943 to 1955 -- but during his presentation which was very fascinating, he gave the backgrounds on X-10 and he used, I think it was 58 slides or something like that to do that, and I just wanted to point out at the beginning of that, and also present this slide which he used because this is a very complex site, as I'm sure you all know.

And then we have also the overlap with Y-12 and this diagram that Tim used shows that.

Fortunately, I think that our Work Groups overlap, so I hope we come through this and make them mesh well.

Okay, next slide.

I actually copied another one of Tim's slides, which was called exotic radionuclides, and I've always been fascinated by this.

I think this is kind of an interesting terminology.

I tried to look up to see what does exotic really mean maybe more in terms of science than perfume or whatever else, but it means strange or intriguing, which doesn't really help us too much.

So I tried to look up the origin of this terminology and I couldn't find it, but I think what I really want to do is pertinent here for X-10, is that exotic radionuclides are anything that wasn't plutonium, thorium, uranium, tritium, or mixed fission and activation products.

And these things of course can be produced by reactors and cyclotrons.

So, in 2012 then, NIOSH stated that due to their resource overlap, they decided to reserve the exotic radionuclide evaluation at ORNL, and combine it with the Y-12 effort, and you see that that's happening, and now we're getting some results.

Okay, so now let's go to the next slide.

So specifically what I'm going to report on is the update on RPRT-0090.

The title of RPRT-0090 is monitoring feasibility evaluation for exotic radionuclides produced by ORNL Isotopes Division.

And there are two words in there which I don't have written on the slide, but will come up in the discussion as I go on.

One of them is feasibility and the other phrase is Isotopes Division. So as I mentioned, our Work Group had our first meeting June 2021.

Because there was a long time between the beginning of the work on this and the meeting, we had a lot to cover.

We had four relevant documents under discussion.

First of all, of course, the important RPRT-0090, which was produced March 28, 2018, dealing with assessing doses from isotope production at ORNL from 1955 to 1988.

Then following that, SC&A reviewed RPRT-0090 and came out with their report in October of 2018.

Then, NIOSH responded to the SC&A review of RPRT-0090, and that report came out in June of 2020.

And then SC&A reviewed NIOSH's response to SC&A's review of RPRT-0090, and we got that in January 2021.

So you see, really, the bottom line is there's a lot of material here.

In our Work Group meeting, we dealt with SC&A's seven findings and six observations.

On the findings, three are open, pending NIOSH action, four are closed. Under the observations, two are open, pending NIOSH action, and four are closed.

And that's what we're going to talk about then for the rest of the time today.

So I'm going to get into the findings first.

We'll go to the next slide.

I think we have time, especially since we're way ahead of schedule, but my talk is not going to take a full hour that has been assigned, so I think we'll have time for questions as I go along.

So I tend to go full speed once I get going, so just jump right in and just stop me and ask your questions.

So, on Finding 1, SC&A asked that the scope of RPRT-0090 needs to be clearly defined.

An answer to this, NIOSH clarified that they should remember that it's only the activities, the ORNL Isotope Division, that or the scope of the report, and probably what prompted SC&A to bring this up is they were wondering about activities with the waste management construction and maintenance, and those activities are not included.

SC&A accepted this clarification in the Work Group and they recommended that the finding be closed,

and the Work Group agreed. So, Finding 1 was closed.

Okay, Finding 2. Next slide.

SC&A said that there was an incomplete radionuclide and radioisotope facility inventory in the report.

Specifically, they said they found several radionuclides missing from Table 7-2, which in the report is a listing of radionuclides.

NIOSH responded and explained that the discrepancy is due to the focus of the document being on radioisotope production only.

In other words, again concentrating only on the Isotopes Division. NIOSH said that they would in the next revision make sure that they explain that.

SC&A accepted this clarification, the Work Group then accepts SC&A's recommendation to close the finding, so Finding 2 was closed.

Those were fairly straightforward and easy, which is not going to be the case for a few here.

So Finding 3.

Finding 3 and 4 actually are two important related findings, and I want to point out that we need to keep in mind the purpose of RPRT-0090, and this, I think Dr. Taulbee tried to clarify during our Work Group meeting, is that it's not an evaluation report.

And he can go into that more if you have more questions on that, but instead, it's an initial evaluation of what radionuclides were produced and what bioassays were available.

So we should keep that in mind then, and going on to Finding 3, SC&A said that the in vitro bioassay methods lack information about actual implementation.

Specifically, they said that the report does not

discuss actual implementation of methods, as required by DCAS Implementation Guide 6, 006.

However, NIOSH reminded us that DCAS Implementation Guide 006 was issued after RPRT-0090, after the first version of RPRT-0090 came out.

So, the question is, how to handle that.

The Work Group agreed that the findings should remain open pending NIOSH action, so what NIOSH is going to do is to develop co-exposure models for exotic radionuclides, and also update the language in RPRT-0090 related to feasibility.

And that may bring about some questions, but really what was under discussion here is what really is the meaning of feasibility?

Well, what is capability? And there was a lot of back and forth between NIOSH and SC&A on that.

So NIOSH's action will be to straighten that all out, we hope. So Finding 3 stays open.

Okay, like I said, just jump in if you have questions.

Finding 4, SC&A said that the feasibility of monitoring 28 radionuclides was not adequately addressed, specifically they were talking about the radionuclides in Table 7-6 and said there was no sufficient detail. Again here, there was a lot of discussion. NIOSH responded that the approach that they expect to be used is the source term approach, which by the way is an accepted procedure for bounding dose.

SC&A said, well, this approach needs a better explanation in the next revision, and then I think also, one of the members of the Work Group mentioned that a lot of the kind of problems here have to do with wording, and that attention should be paid in the next revision to careful wording.

So, the Work Group agreed that RPRT-0090 needs to be updated with more suitable wording. We just did that.

I don't know what that noise is, but it's not coming from here.

Remove the language regarding insignificant intakes, and right at the moment I can't remember what that had to do with. If you have questions about it, perhaps somebody can help us on that.

Anyway, the NIOSH action will then be to update the report with more detail on the dose reconstruction approach for the 28 listed radionuclides, so this finding remains open.

Any comments or questions, or straightening out that I need on that one?

Okay. We'll move on then to Finding 5. Now we get into the really exciting part.

Finding 5, by the way, and Observation 6 are related, and we'll talk about that.

In Finding 5, SC&A had quite a bit of concern about iodine, in particular, the 1955, 1956 intakes that might not be bound by earlier co-exposure data.

This all has to do with reconstructing iodine doses, and actually we should keep in mind here that there are two source terms, two processes that have to be evaluated.

One is the actual radioiodine production, and the other one is the radioactive lanthanum iodine by-product release.

And as I mentioned, SC&A found many issues with the approach that NIOSH proposes for figuring out the exposure for unmonitored workers.

In fact, it covers about 30 pages in the transcript, so that gives you an idea of what needs to be covered.

The Work Group agreed with SC&A that the finding needs to remain open, pending NIOSH action.

NIOSH agreed that they need to revise the -- or well,

the Work Group agrees NIOSH needs to revise the iodine approach based on standards of IG-006 after SC&A concerns have been evaluated in detail.

And actually, at the meeting, NIOSH said that they are developing this, so this finding remains open.

And we'll talk a little bit more about it in Observation 6 later because it's really pretty much the same thing.

Okay, Finding 6. SC&A addressed the adequacy and implementation of in vivo bioassay program, well, and said that NIOSH had not addressed this.

It said that the implementation is not sufficient in the report.

Actually, this was covered under Finding 3, or will be covered under Finding 3, so this particular finding then in our terminology is subsumed under Finding 3, so this one we said could be closed.

Finding our last finding, it's Finding 7.

SC&A said that there's unclear treatment of post-1988 monitoring capability during abandonment, deactivation, and D&D phases.

Well, actually, if you remember back a few minutes ago, we dealt with this specific thing under Finding 1, and in that one, NIOSH clarified the scope of RPRT-0090, saying that the report only includes the production operations of the Radioisotope Division, and these areas are not included.

So, Finding 7 is closed.

So we end up with three findings, open and four are closed. And I will move on into the observations if there are no questions.

Okay, Observation 1. These observations probably are less exciting because by definition, observations have minor or no effect on things, but nevertheless, we do pay attention to them.

SC&A pointed out that there was an inventory discrepancy between Table 7-2 and the X-10 inventory spreadsheet, and NIOSH clarified this and said, well, there are actually two reasons for that.

One is that they have found some additional data in logbook, and then they also pointed out again that the scope of the document, of RPRT-0090, is the Isotopes Division only, and that might account for some of the discrepancy.

So, SC&A recommended -- they said okay, we can close this one. The Work Group accepted that, so Observation 1 is closed.

Okay, Observation 2. SC&A pointed out that specific alpha-emitting radionuclides need to be identified for dose reconstruction. They said that the X-10 database does not always list the specific radionuclide needed for dose reconstruction.

NIOSH clarified that and said that only the actual bioassay cards that are used for dose reconstruction and that they contain this information.

SC&A said okay, this is okay then to close this observation, the Work Group accepted that, and Observation 2 is closed.

Observation 3 -- I mean, 3, yes. I skipped one almost.

Okay. SC&A stated that trans-plutonium radionuclides may need further analysis, and NIOSH explained that americium-241 is used as a default and that assigning this is a reasonable default assumption.

I think I got a little confused there.

SC&A asked whether assigning americium-241 as a default was a reasonable assumption.

NIOSH responded to that and added to this that actually, the bioassay cards, if they had the actual radionuclide on them are the ones that are used.

So, all are in agreement. SC&A agreed with this and this observation was closed.

Then Observation 4.

SC&A said that the use of gross beta or gamma count data could result in underestimate of the dose, and specifically, that if one uses gross count data without knowledge of the counting system -- for example, important things like calibration and counting efficiencies, correction factors and so on, this could lead to an underestimate of the dose.

NIOSH said that the specifics of the dose reconstruction approach are outside the scope of RPRT-0090, but they will be added to the revised report, so this information will be included, and SC&A agreed that as long as NIOSH does as they say they're going to, that they would accept that.

However, we decided to keep this observation open.

Then Observation 5. The results in Table 7-6 depend on the inventory used. SC&A pointed out that the spreadsheet used for X-10 data is incomplete, and actually this is the same as Observation 1.

And NIOSH then added that they will address the revision.

In the revision of RPRT-0090, they'll address this and in the next revision of TKBS-0012-5, and they said, in fact, they have already done this, had taken care of this in 2020.

I'm not sure if they meant in a report or what, but we agreed that this observation could be closed.

Observation 6. Additional radioactive lanthanum information should be provided.

This probably sounds familiar to you because we dealt with this in a subsection of Finding 5.

And we mentioned that there are different exposure potentials between the commercial iodine

production, one of the source terms in the radioactive lanthanum process.

So since it was already discussed and already agreed upon, well, we didn't close it. I checked on this.

I kind of thought it would be, but we decided to leave this one open until we get the results from NIOSH.

So, in the observations then, two are still open and -- or closed.

I haven't had any questions yet, but I will invite them.

I'd also think that it would be useful to all of us if NIOSH would be able to give us some idea of the path forward here.

There's a lot of work to be done. I wonder if we can get some idea of how much time will be needed to follow through, and at that point, just what would be the next step?

Any comments from NIOSH?

Dr. Hughes: Yeah, so --

(Simultaneous speaking.)

Dr. Hughes: This is Lara Hughes. Can you hear me?

Member Roessler: Yes.

Dr. Hughes: Okay. The little thing didn't come up.

So, I think the first thing you would expect is a revision of RPRT-0090.

I do not have a timeline at this point, but that would definitely be the first paragraph that you would see.

Given the current situation, I'm not sure, and as you know, the co-exposure model developing based on the current IG-6 guidelines.

It's a lengthier process, so we're looking at a

substantial amount of time until that would be addressed.

So, given the current situation, or in general, I can't really give you an exact timeline, but I know that RPRT-0090 is being worked on right now, and that will be coming out in the near future. Let's leave it at that.

Member Roessler: So at the point you have addressed the issues then, I assume we will get notice of that, and then we'll convene another Work Group meeting?

Dr. Hughes: Yes.

Chair Anderson: Do you think it'll be by December?

Mr. Taulbee: This is Tim. There's no way for us to say right now.

I mean, some of this development is being wrapped up into the cyber security modernization initiative, and so, you know, I mean, we will as soon as we can, but we really just don't have any way of knowing. Sorry.

Chair Anderson: Yeah. Well, always worth an ask. Right, you know, right?

Member Roessler: Hey, are there any other questions or discussion? If not, then I think our Work Group report is complete.

Chair Anderson: Well thank you for putting that together. That was very helpful. It's just frustrating with the cyber security issues to not be able to move forward.

So, any other issues people want to raise, or questions on this for Gen or Lara?

Rashaun?

Dr. Roberts: Yes. Can you hear me?

Chair Anderson: Yep.

Dr. Roberts: So, this is our last agenda item.

So, I don't know if there's more that you wanted to raise or cover, Andy, but that's the end of the agenda.

Chair Anderson: No, I don't have anything, and if others don't either, I'll accept the motion to adjourn.

Member Beach: Seconded.

Chair Anderson: Okay.

Member Kotelchuck: So moved.

Member Beach: Or so moved, I should say.

Chair Anderson: Well good, you get a little extra time, so.

Member Kotelchuck: All right.

Chair Anderson: We'll wait for advancement on the cyber security update, then move forward.

And we do have one Work Group that'll be meeting in September, Dave, so.

Member Kotelchuck: I know. Yes. Okay.

Member Beach: So, I have a quick question, Dave. Can we meet without --

Chair Anderson: Go ahead.

Member Beach: Access to -- because I can't get on anything, and normally we use the O drive for our dose reconstruction meetings.

Chair Anderson: Yeah.

Member Kotelchuck: Right. I figured that by then, we would -- that's always been the assumption by then, we could get in the materials.

In fact, I don't know if Rose is still on the line, but --

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Ms. Gogliotti: I'm here.

Member Kotelchuck: I thought we had access to those materials now.

Ms. Gogliotti: We don't at the moment. Grady is working on a workaround, or at least that's what he told us yesterday.

Member Kotelchuck: Oh okay.

Ms. Gogliotti: But he can't guarantee us. I told ---

(Simultaneous speaking.)

Mr. Calhoun: I am still -- this is Grady. This is Grady, I am still working on that.

And gosh, I really thought that maybe something would've happened by today, but what we're doing is trying to transfer the actual whole files that you need, so I should hear something about that any day here, and then we're going to have to schedule a meeting with one of our folks with you to teach you how to access it.

Member Kotelchuck: Yeah, I'd appreciate that.

If you guys can handle that workaround over the next two, three weeks, that will give us plenty of time.

We actually deferred a meeting this summer precisely because we couldn't get the records, and I felt like we could not go ahead without the members of the subcommittee being able to access the records.

So, given that you're working on it, let's figure that you'll be able to do the workaround, sir, by then, and that we'll be able to go ahead with the meeting.

So, I'm hoping that the problem you are raising, Josie, will be resolved soon.

Member Beach: Sounds good.

Member Kotelchuck: Okay.

Ms. Gogliotti: Grady, for clarification, your training, is that for the subcommittee, the full board, for SC&A? What are you thinking?

Mr. Calhoun: Yeah, this, what we'll do first is we'll just do it the way it makes the most sense, so we're going to try to get access to the people who need it first, and then we will have Lori probably call you guys and show you how to access it.

So, we're not going to try to get everybody access, just you guys first that need it, and then we'll move forward from there.

Member Kotelchuck: Okay, I appreciate it.

Mr. Calhoun: That'd be easier for everyone that way.

Member Kotelchuck: Yeah, and we're going to be working on Set 29. So, that's really what we need for our meeting.

Chair Anderson: Okay, any other business?

Oh, Rashaun, you --

Mr. Calhoun: Hey Rose, just since I've got you on the phone here, we've got the numbers for 29.

Is that all you need, Set 29, or do you need them for 30 as well?

Ms. Gogliotti: I just need all of the files for Set 29.

Mr. Calhoun: Just for 29?

Member Kotelchuck: Just 29.

Mr. Calhoun: Okay.

Member Kotelchuck: Yeah, good, okay, I thought you had them -- would be yes. Good.

Yes, that's what we need, we finished up the other -- virtually finished them up, and we can come back

to the ones from earlier sets at a later time.

There are not many, they're just ones that require work or other subcommittees looking things over.

Ms. Gogliotti: The other ones will have to wait, Dave, because we don't have the BRS, and that's how we ---

(Simultaneous speaking.)

Member Kotelchuck: That's right, yeah. Yeah, Set 29, and then we're ready to go, at least for this next one.

Chair Anderson: That sounds good.

Member Kotelchuck: Set 29 for the 29. Just remember that, subcommittee members.

(Simultaneous speaking.)

Chair Anderson: And Rashaun will begin to put together an agenda for the next meeting as that comes up, and let's see what happens with cyber security, and we'll keep everybody informed, and I'm sure NIOSH will as they move forward on selecting new members.

Member Kotelchuck: Okay.

Member Beach: Sounds good, Henry, thank you. Good job.

Chair Anderson: Yeah, well, we got to keep ourselves busy and going so hopefully, you know, we got enough on the agendas.

If you look at the long list of the SECs that we're working on, we need to close out some of those as soon as we can. And Bob, thanks for all your work on all of this, too, so.

Okay, with that, I guess we can adjourn the meeting, and thank you all.

Adjourn

(Whereupon, the above-entitled matter went off the record at 2:52 p.m.)