UNITED STATES OF AMERICA
CENTERS FOR DISEASE CONTROL

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NATIONAL INSTITUTE FOR OCCUPATIONAL
SAFETY AND HEALTH

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ADVISORY BOARD ON RADIATION AND
WORKER HEALTH

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118th MEETING

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THURSDAY
AUGUST 24, 2017

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The meeting convened at 8:30 a.m., Mountain Time, in the Courtyard Marriott, 3347 Cerrillos Road, Santa Fe, New Mexico, James M. Melius, Chair, presiding.

PRESENT:

JAMES M. MELIUS, Chair
HENRY ANDERSON, Member
JOSIE BEACH, Member
BRADLEY P. CLAWSON, Member
R. WILLIAM FIELD, Member
DAVID KOTELCHUCK, Member
JAMES E. LOCKEY, Member
GENEVIEVE S. ROESSLER, Member*
PHILLIP SCHOFIELD, Member
LORETTA R. VALERIO, Member
PAUL L. ZIEMER, Member*
TED KATZ, Designated Federal Official

REGISTERED AND/OR PUBLIC COMMENT PARTICIPANTS

ADAMS, NANCY, NIOSH Contractor
BLAZE, D'LANIE
BURGOS, ZAIDA, NIOSH
DOMINA, KIRK, Toxic Substances Board
ELLIOTT, JOHN*
ELLIOTT, MICHAEL*
FITZGERALD, JOE, SC&A
FROWISS, AL
GRIFFON, MARK, Toxic Substances Board
JOHNSON, DARRELL*
HINNEFELD, STU, DCAS
LEWIS, GREG, DOE
LORENZEN, WILLIAM*
NETON, JIM, DCAS
RUTHERFORD, LAVON, DCAS
STIVER, JOHN, SC&A
TAULBEE, TIM, DCAS
TOMES, TOM, DCAS*
VEALE, FRANCIS*
VIOLET, ARLENE*
WORTHINGTON, PAT, DOE

Contents

P-R-O-C-E-E-D-I-N-G-S

(8:29 a.m.)

Welcome and Introductions

CHAIR MELIUS: You might want to write that down. And welcome. And I'll let Ted do the introductory stuff.

MR. KATZ: Okay. Welcome, everyone, this is the Advisory Board on Radiation and Worker Health, Day 2 of our meeting here in Santa Fe.

And for people on the phone, just the preliminaries. The agenda for today, and for yesterday of course, and all the materials that we'll be discussing today are posted on the NIOSH website for this program under Schedule of Meetings, today's date.

You can go there, pull up all the documents, including the background reading. Follow along as you wish. There is also a web conference link that's specified on the agenda, at the top of the agenda.

So, if you want to see the slides as they're presented, as opposed to following through on your own with the slides that are posted there, you can do that to, join that web conference.

And finally, for everyone listening on the phone, please keep your phones muted, to help with everyone's audio quality, yourselves on the phone, as well as the people in the room. And if you don't have a mute button on your phone, press *6, that will mute your phone. Thank you.

So, I'll get to roll call now. And I can just mention ahead of time, the Board Members have no conflicts for any of the sessions today. So, we don't need to address those. So, let's run down the list.

(Roll call)

CHAIR MELIUS: So, our first item on the agenda today is Metals and Controls Corporation, which is an SEC Petition. And Jim Neton's going to present.

Metals and Controls Corp. SEC Petition

(1968-1997; Attleboro, MA)

DR. NETON: Okay. Thank you, Dr. Melius. This is a Metals and -- I'm going to present the Petition Evaluation Report for Metals and Controls Corporation. It's SEC Petition Number 00236.

Before I get started I would like to acknowledge the efforts of our NIOSH subject expert on this Evaluation Report, Pete Darnell, and the ORAU team specifically, Pat McCloskey, who did the bulk of the work putting this report together.

The Petition was received just about a year ago, September 1st, 2016. And it's a pretty lengthy Class. I think I'll read it in one time for the record, just so it's there.

It's all facilities construction maintenance workers, including lubricators, oilers, industrial pipefitters, engineering technicians, mechanical, electrical, structural, maintenance supervisors, electricians, plumbers,

millwrights, carpenters, instrumentation technicians, chemical handlers, waste treatment operators, and all production workers, including machine operators, helpers, and repair and maintenance, commonly called R&M workers who worked in Buildings 4, 5, 10, interior areas, and Building 5, 10, 11, 12, 17 exterior areas at Metals and Controls Corporation in Attleboro, Massachusetts, during the period from January 1st, 1968 through March 21st 1997.

You can see that this is essentially a combination of building trades workers. And it does include all production workers though. So, it's essentially anybody that worked in the plant. But specifically doesn't address administrative type worker.

The Petition was qualified under Part 83.13, which is the case where we receive a Petition from a qualified person, or eligible person who files a Petition, as opposed to the 83.14, where it's a NIOSH self-initiated

Petition.

It was qualified on November 14th, 2016. And like most Petitions that are Petitions for the residual period, it qualified based on lack of monitoring data.

The Petition Class we evaluated is essentially identical, with a few grammatical commas thrown in, as the Class that was petitioned.

A little background and history. Metals and Controls is a fairly large site located on 100 acres in, like I said, Attleboro, Massachusetts. It's about 30 miles south of Boston.

The covered period for, the covered operations for AWE included January 1st 1952 through December 31st 1967. And there's a fairly lengthy residual radiation contamination period from January 1st '68 through March 21st, '97.

The Board might recall that all the AWE operations were added to the SEC under

Petition 149, back in 2009. And that was an 83.14 Petition, that is, a Petition self-initiated by NIOSH, where we determine an infeasibility for reconstruction of doses during that time period.

So, the Petition itself now, of course, specifically only deals with the entire residual contamination period, this new Petition that is.

Radiological operations at the Metals Controls did begin in 1952. And it started in a couple of buildings. It originally started in Building 4, and moved some operations into Building 3. And included a fairly complex mixture of work for the Navy, Air Force, and other Government agencies.

In fact, the bulk of the work conducted, radiological work conducted in the covered period was work for the Navy. It's estimated that about 90 percent of the work during that time period, radiological work,

involved fabrication of fuel for the Navy.

In 1957 all radiological operations were moved to Building 10. And I'll talk about this a little later. But Building 10 contained a fuel manufacturing area.

Just for a point of reference, in 1959 Metals and Controls merged with Texas Instruments. And although I'll still refer to them as Metals and Controls as I go through the presentation.

I mentioned a variety of operations during the AWE period, fabrication of enriched uranium for the Navy, which was primarily 93 percent enriched uranium. Also, production of foils for the Government, and research, and some commercial customers.

The did process a fair amount of depleted uranium. I believe it was for Argonne National Laboratory. They took derbies, and made various pieces and parts out of the natural uranium, depleted natural uranium.

The did limited research and development, and fabrication work with thorium, included making thorium fuels, alloys, and foils for Brookhaven.

Early in the 19, no, mid, I think the late 1960s they did produce some electrical, self-illuminated circuit breakers that had radium in them. That was conducted in Building 1. That activity was a covered exposure during the covered period. But is not relevant to exposures during the residual contamination period, the radium exposures, that is, in Building 1.

Also, during the residual contamination period -- Well, all radiological operations stopped in 1967 at the site, except for these fuel fabrication for the High Flux Isotope Reactor. And it was work done for Oak Ridge National Laboratory, and some other Government researchers.

The High Flux Isotope Research Reactor operations, however, are not covered exposure

under EEOICPA during the residual period.

Now, that's not a NIOSH determination. There's actually a letter in the Site Research Database from the DOE, issued in 2001, that made this determination. Basically concluding that the HIFR was a, used for peaceful operations, and not related to the nuclear weapons programs.

So, that complicates things a little bit. You have this ongoing operation in Building 10 during the residual period that is not covered exposure.

This is just a diagram of the site. You can see there in the sort of central part of the diagram, Buildings 3, 4, and 10, where all the radiological operations occurred.

Just south of Building 4, I don't know if you can see it from the audience, but there's a little blurb of a Building 5, a little building there. And that was a radioactive materials area where they stored and processed some of the waste during the site. And that became contaminated.

And just to the east of Building 10, a little bit south and east you see Buildings 11 an 12. In between those buildings was essentially a waste burial grounds, where they took and disposed of some of the waste products from the operations.

But and large, those are the only areas of this 100 acre site, comprised of some 20 buildings, that involve contamination with covered exposures.

A little bit about Building 10, where they moved the fuel manufacturing operations. It was a building separated by floor to ceiling partitions, and had two separate areas, an unclad fuel machining area, and a clad fuel machining area.

And they were completely separated, had different ventilation systems, and such. And they were not intermingled. They were handled separately, and processed separately.

And in Building 10 was also this High

Flux Isotope Research Reactor area, where no unclad material was allowed. This is a depiction of that building. And you can see the large area, labeled CMA, the clad materials area, or clad machining area.

It's pretty large. It's about ten times larger than the unclad machining area, which you see in the lower left hand corner. And just to the south of the unclad machining area you see the HIFR area, where the High Flux Isotope Reactor work was conducted.

There's a fairly long decontamination, decommissioning program at this site. At the end of commercial operations in, of radiological operations in Building 3, 4, and 10, with the exception of the HIFR area, they were cleaned. That was in 1967, finishing in 1968. So, they were D&D'd at that time.

And no covered radiological work after those AWE operations was conducted in those buildings, with the exception of the HIFR. And

surveys were taken at that time to demonstrate they were clean. Unfortunately the site could not locate those surveys in 1982.

So, they ended up re-surveying the site in 1982 to demonstrate that they were still indeed clean. We'll get into that a little bit later.

As I mentioned, the rad waste materials from the radiological operations was processed inside/outside of Building 5, and then shipped off site. And again, limited on site burial between Buildings 11 and 12.

Okay. In 1981 the site started to initiate a site wide D&D, because the HIFR operations were coming to an end. And that would have been the end of all radiological operations, both commercial and, well, AWE finished in '67.

And so, D&D was performed in the HIFR area by contractors. It was not done by the M&C personnel. Building 10 had the highest pre D&D contamination levels. They did a fairly

comprehensive grid survey with the highest values about 1260 dpm per 100 square centimeters, and external exposure rates .15 mR per hour.

In 1983 the NRC allowed for initial release of the AWE processing areas. That's Building 3, 4, and 10. Now, this gets a little confusing. But in 1982 they D&D'd the HIFR area, and they thought they were done with D&D.

But what happened over time was little pockets of contamination showed up, not on necessarily accessible surfaces, but like burial grounds between Building 11 and 12, and some burial activities near Building 5. So, what you see here is sort of a listing of what happened in those D&D operations after 1982.

In '84 ORISE did a survey. And they, it was basically a gamma survey of the areas. And identified pockets of buried materials. So, they did a remediation in '92 through '93. The found some more pockets. And finally in 1994, around '93 the burial grounds were done, Building

11 and 12.

But once they started finding more and more buried contamination they decided to re-survey the metals recovery area, metals areas. And it turns out they did find more contamination. But they were again on more inaccessible surfaces, joints between concrete cracks, underneath equipment, that sort of thing.

So, in general, the surveys that were done earlier were valid. But again, there was still contamination that would not allow the site to be free released to the public without, you know, cleaning up the rest of the material.

And this just sort of finishes the issue. In '95 the NRC did a site wide comprehensive characterization. A little more remediation occurred in '95, to clean up some of the more accessible areas again. And finally, in 1997, which is the end of the residual period, the NRC did a site wide release for unrestricted use of the site.

Okay. So, what do we have available to reconstruct exposures during this time period? There's about 600 documents in the SR, Site Research Database, that were collected over time from various locations.

We have documents and affidavits provided by the Petitioners. And we have our normal data searches that we conduct, such as internet searches, on the OSTI, Office of Science and Technology, DOE Legacy Management Database, those types of internet websites.

And we also have guidance available from some of our own documents, TBD-6000. We used NUREG/CR-5512 to estimate ingestion. And as we do in many residual contamination instances, we rely on OTIB-70 to model doses.

Just a little bit about the number of dose reconstructions from the site. There's 448 claims that were submitted for dose reconstruction. What's interesting to me is the number 314, which is dose reconstructions

completed for energy employees who started their employment during the period under evaluation.

So, 70 percent of the claims we have are affected by this SEC Petition, which is higher than I expected. But it turns out that the site had a large number of employees. I think in the early '60s the site population was somewhere around 6,000. And it diminished down over time in the '80s to around 1,000, in that ballpark.

So, it's a pretty large site, with a very active population in the '60s, which is the residual contamination period. So, I guess it shouldn't be surprising that we have that many claims affected.

And as you would expect, this is a residual contamination period. So, we have very little, limited personnel monitoring data, whether it's external or internal.

So, the potential for exposure is, as I talked about earlier, is inhalation, ingestion

of uranium and thorium source terms. And for internal. And then, of course, there would be external photon and beta exposures from those materials.

So, the internal monitoring data. We have a fair amount of routine contamination survey data. We have survey data that we can take from the end of the operational period.

Remember, I said they surveyed the Buildings 3, 4, and 10 in '68. And it was decontaminated, and determined to be clean. They couldn't find the data.

So, what we did is, we went back a little prior to that, and used some of the data, survey data from just at the end of the operational period, thinking that would provide a good starting point for bounding exposures in the residual period.

For comparison we actually did review some of the data in the residual period for the commercial activities, just to make sure there

was no major disconnect between what was going on in the HIFR area, and what was going on in the rest of the site.

Similarly, with the external monitoring data, we had film badge data from the end of the operational period that does include exposures from both residual contamination and ongoing operations. But we could not figure out any way to separate those two. So, we just combined them together. Or we just didn't try to separate them.

And again, we looked at the film badge data, and survey contamination, survey, radiological survey data, as a sanity check on what we were using, to make sure we, there was no major disconnect there.

Okay. So, we found that the available monitoring records, those beginning survey data, ending survey data, and film badge results, are available so that we can develop a dose reconstruction approach for this time period.

So, to estimate internal doses in this time period we took the 200 plus survey data entries that were taken before the D&D was completed, and took the 95th percentile value.

So, we had a starting point, or what the surface contamination values were at the beginning of the residual period. And in the 1982 timeframe we had 7,000 survey data points at the end of the operation, at the end of the HIFR operations, that, and were compiled. And we took the 95th percentile of that.

Then we used the TIB-70 approach to do a source term depletion rate, as we normally do, using a re-suspension factor from those surface contaminations of ten to the minus six, so that we can get an air concentration data.

So, if you fold that all together, and for a certain breathing rate you end up with a curve that looks something like this, which is the annual inhalation of alpha emitting material. Not just uranium, but these are gross alpha

measurements.

So, we started somewhere around 14 dpm in 1967 or '68, and diminishing down to somewhere around one dpm in the 1997 timeframe. So, this is our standard TIB-70 approach, where you take the starting survey contamination data, ending data, and develop an intake, inhalation intake based on that.

I did mention that these were for, these surveys were gross alpha surveys, not isotope specific. We do know that they processed both uranium and thorium. So we will, in the case of dose reconstruction for this time period we'll take the most claimant favorable intake of either uranium and thorium for the cancer being evaluated, and use that in the dose reconstruction.

The amount of activity ingested can be computed using the survey contamination data, and using the NUREG/CR-5512 value of ten to the minus four of square meters per hour of ingestion,

which we've used in the past.

Okay. External dose is a little more straightforward. We had 162 film badge results from the end of the operational period. These are Landauer film badge results. And we located the 95th percentile in that distribution.

And by the time, we added in missed dose, two dose film badges. And in doing that we ended up estimating a total exposure at the end of the operational period of 165 millirem per year, which would include ongoing operations at the HIFR.

We also looked at film badge data for non-covered work during the residual period in the HIFR area. And that came out, based on five quarters of data in the '70s, to 193 millirem per year.

So, given the uncertainties involved in all of this we ended up using a claimant favorable constant distribution of 200 millirem per year, assigned for every year, with no source

term depletion.

Medical x-ray is not covered in the residual contamination period. So, we didn't have to worry about that for this evaluation.

So, the intakes of these external doses for the residual will apply to all personnel with primary responsibilities in the rad area, both the intakes, internal inhalation intakes, and the external doses.

For administrative or non-production personnel we're going to assume that the workers' exposures were ten percent of those associated with the production workers. And that's something that's defined right in TBD-6000. So, that's what we intend to use.

So, just to wrap it up here. We're in the residual contamination period. We believe that we can reconstruct between 1/1/68 and 3/21/97 internal exposures and external exposures. And we believe that there is sufficient accuracy to estimate both the internal

and external for all members of the evaluated Class. And that's it for my presentation.

CHAIR MELIUS: Thank you. Thank you, Jim. Questions from Board Members? Josie?

MEMBER ZIEMER: Jim?

CHAIR MELIUS: Oh, I'm --

MEMBER ZIEMER: Jim, this is Paul Ziemer. And I wanted to let you and Ted know that I came on the line just as Jim was starting. So, I am here today. I just missed the roll call, I guess.

CHAIR MELIUS: Okay. Well, welcome. We started on time for a change. Almost on time anyway. Thanks, Paul. Good. Josie, you had a question?

MEMBER BEACH: Yes. Jim, you partially answered it. There's so many questions I have with this site. But your Class Definition, you excluded the administrative Class.

And as you were going through this, I

know there's a lot of buildings where interior was an issue. But there's several buildings where exterior is an issue. And looking at, just briefly at the cleanup in the different years, I wonder if ten percent is an adequate number.

And I know you can't get into that now. But that would be a question I'd have for administrative personnel. We know that that can be a very different set of people that would be in and around those areas.

DR. NETON: Right. I meant to say this, and I didn't. The cleanup, the D&D work that was done after '80, and starting in '82 and later, was done by subcontractors.

MEMBER BEACH: Right.

DR. NETON: It was not done by Metals Controls personnel. And they were done under some fairly well defined health and safety plans. We have copies of them. They were well described. Where they would actually cordon off areas, use HEPA filters, ventilation, those sort

of things, to minimize exposure. So, we're pretty comfortable with the fact that we don't believe that on site personnel were unduly exposed during those D&D efforts.

MEMBER BEACH: Yes. And my concern isn't really the D&D efforts. I realize those would be monitored, and closely cordoned off. But those areas were available for access potentially before D&D. The D&D years weren't, were several years after.

And then, what was going on around Building 1 at -- Your slide said everything was released unrestricted except for Building 1. I didn't realize Building 1 was part of the contaminated areas. And when I went back to look, I couldn't find anything.

DR. NETON: Yes.

MEMBER BEACH: But you mentioned it in your slides.

DR. NETON: Yes. I noticed that going over it this morning too. And I think, well, all

I know that happened in Building 1 that was radiological work was those electrical circuit breakers that had radium in them.

And if there was some residual contamination from radium it wouldn't be covered anyways. Because that's not an AEC derived source of exposure.

That was done for, I forget if it was the Navy, some armed forces. It was done for the military. And so, that wouldn't be covered. But you're right. It would be best to know what that was. I really don't know that.

MEMBER BEACH: Okay. Thanks.

CHAIR MELIUS: Other Board Member questions? Yes, Henry.

MEMBER ANDERSON: Yes. You started with the survey data from '66/'67. How did that compare to the 1982 data?

DR. NETON: It was higher. What we did, to be clear, is we took, the '82 data was a fixed contamination survey, not a smear.

MEMBER ANDERSON: Okay.

DR. NETON: And we used an approach where in general it's assumed that ten percent of the contamination is loose, out of total contamination value. So, we when we took ten percent of that I think it was probably about, I can't remember now, quite a bit lower. I can't tell you exactly.

MEMBER ANDERSON: Yes.

DR. NETON: Not an order of magnitude, but much lower than the data that we started with in 1968.

MEMBER ANDERSON: Because I was just looking at your decay curve there. It looks to be pretty regular --

DR. NETON: Yes.

MEMBER ANDERSON: -- which I would assume would be --

DR. NETON: Well --

MEMBER ANDERSON: -- different if you start from the high --

DR. NETON: Well, if you have two points you can generate a pretty smooth curve.

MEMBER ANDERSON: Yes.

DR. NETON: I mean, but --

MEMBER ANDERSON: Well, that's --

DR. NETON: To be fair. Let me just bring that up. You can see, you can get a rough idea if you look at that graph. The data points were in '82. So, you're somewhere around four dpm in '82, and 14. So, that ratio would be the difference. You know, it's all scalable from that graph. So, 4/14ths.

MEMBER ANDERSON: And the graph is starting from the '66 data?

DR. NETON: Yes. The starting point was the 1966/'67 survey data. The ending point, I probably should have showed that on this graph, was the '82 data. And we fit an exponential, just like we do, TIB-70 recommends, through those points to estimate in between all the intervening years.

MEMBER ANDERSON: Okay.

CHAIR MELIUS: Brad.

MEMBER CLAWSON: Yes. I just a clarification question. We're using TBD-6000 for that to do it?

DR. NETON: Well, 6000, only to the extent we're using some of the concepts in it. We're not using any surrogate data from 6000. We're using the fact that a ten to minus 6 degree resuspension factor is valid.

We're using the concept that ten percent of, the administrative people have ten percent of the exposure to the production workers. That's about the only two things out of 6000 that are used. Again, we have site specific data here that we're using.

MEMBER CLAWSON: Okay. I'm just trying to get a clarification on that. Now, has SC&A even looked at this?

DR. NETON: They have not.

CHAIR MELIUS: Okay. I actually have

a question on the earlier D&D effort. I think you said the original SEC Class went through '67, but the D&D was '67 and '68?

DR. NETON: Right.

CHAIR MELIUS: And so, who did it in '68? I mean, was that contracted out? Or was that people on the site? Or don't we know?

DR. NETON: I don't know that --

CHAIR MELIUS: Okay.

DR. NETON: -- the answer to that question.

CHAIR MELIUS: Yes. Trick question. Yes. Because I think theirs would be different.

DR. NETON: Yes.

CHAIR MELIUS: Yes.

DR. NETON: You're right.

CHAIR MELIUS: Yes. A different approach. Okay. Other questions from Board Members? Paul, Gen, anybody on the line? Okay. Well --

PARTICIPANT: Yes. The Petitioners

are on the line here.

CHAIR MELIUS: Well, we'll call on you in a little bit.

PARTICIPANT: Okay. I'm sorry. I misunderstood.

CHAIR MELIUS: That's okay. I was looking for, we have a couple of Board Members that are on the line. I have a couple of Board Members who --

MEMBER ROESSLER: This is Gen. I have no question.

CHAIR MELIUS: Okay. Paul? Okay. Dave, and then whoever.

MEMBER ZIEMER: Yes. My only question was, I think it was, may have been covered. But is SC&A going to review this? Or are we going ahead today?

CHAIR MELIUS: We're not, we haven't decided that yet.

MEMBER ZIEMER: Yes. Okay.

CHAIR MELIUS: Okay.

MEMBER KOTELCHUCK: Dave Kotelchuck. That was my question.

CHAIR MELIUS: Well, hold on. Maybe we could give the Petitioner time to talk. And we have a few more questions of the Board Members. So, Loretta?

MEMBER VALERIO: Can you hear me? Is this on? Okay. So, I actually have two questions. One is, looking at the Petition Class, I'm wondering are laborers and custodians considered part of the repair and maintenance group? That's the first question.

And the second half of that question is, who handled the waste? How was it shipped? Because you said it was limited. So, who handled it? Who moved it --

DR. NETON: Which --

MEMBER VALERIO: -- the radioactive waste? And --

DR. NETON: During which period, I guess? During the residual period?

MEMBER VALERIO: During the residual period.

DR. NETON: Yes. There was really no waste generated at that point until the D&D operations occurred. All radiological operations stopped, AEC radiological operations stopped in 1967.

And from '67 to '82 the HIFR was in place. But that was not AEC activity. So, any waste generated during the HIFR would not be covered exposure in the residual period.

MEMBER VALERIO: Okay. So, what about during the covered period?

DR. NETON: It's an SEC during the covered period. So, I don't know the answer to that. But it's, you know, all employees are considered covered under the SEC during that period.

MEMBER VALERIO: Okay.

(Off microphone comment)

DR. NETON: I don't know the answer to

that question.

CHAIR MELIUS: Loretta, you have another question? Or, you got your hang tag up there. Okay. Okay. If there are no further questions then Petitioners who would like to make comments, you may.

MR. ELLIOTT: Yes. This is Michael Elliott. I am one of the Petitioners on this SEC Petition. And first, I want to thank Dr. Melius, and all the esteemed Members of the Board for allowing me to speak.

I want to make sure that, I submitted a written statement to the Board on August 18, 2007, 2017, excuse me. And I'm hoping that perhaps you have that. That's where the majority of what I'm going to say today is drawn. So, hopeful you've got that. And if you don't, would you let me know? I'll make sure that I get it to you.

CHAIR MELIUS: Okay.

MR. ELLIOTT: Can you -- Dr. Melius,

did you receive my written statement?

CHAIR MELIUS: I don't believe so. And I don't think anybody here is familiar with it. So, if you could resubmit it, that would --

MR. ELLIOTT: Okay.

CHAIR MELIUS: -- be helpful. But go ahead and make any comments now.

MR. ELLIOTT: Okay. And to whom should, I submitted it to Josh Kinman. To whom should I submit the written statement?

CHAIR MELIUS: We, it would be to Josh. That would be the person. He's not here today. So, we --

MR. ELLIOTT: Okay.

CHAIR MELIUS: -- don't have any way of knowing what happened to it.

MR. ELLIOTT: That's fine. That's fine.

CHAIR MELIUS: Okay. Yes.

MR. ELLIOTT: I just wanted to make sure that you got it.

CHAIR MELIUS: Yes. And just ask, when you submit it to Josh this time, make sure you ask for a confirmation, so you know, and we know. Okay?

MR. ELLIOTT: Got it.

CHAIR MELIUS: Yes.

MR. ELLIOTT: Okay. Thank you very much.

CHAIR MELIUS: Yes.

MR. ELLIOTT: Okay. I'd also like to start off, before I read my statement, I'd like to clarify and correct one statement that Dr. Neton just made during his presentation.

He incorrectly characterized the Class of employees that we asked to be covered. He said that all production workers during the residual period are part of this Class.

We absolutely did not say that. We, in fact, defined the Class very, very narrowly. If he were to look at Section E of our Petition, he would see that we limited it to facilities

maintenance workers, and he did a good job describing what those job titles are within the facilities maintenance workers Class.

We included repair and maintenance workers, equipment repair and maintenance workers who worked in, but only those who worked in Buildings 4 and 10.

And we included production workers, limited to just the production workers who worked on the machines within Building 4 and 10, that were identified in the documents we submitted as having contamination.

So, things like the Lewis Mill in Building 4, the M-110 wire drawing machine, the Bickhart (phonetic) wire drawing machine in Building 10. We were very specific.

It was a very limited, small, small, the number of production employees would be -- you know, really much less than the facility's maintenance workers. The major Class here is the facility's maintenance workers. It is not

production workers. Am I clear?

CHAIR MELIUS: Yes, you're clear.

MR. ELLIOTT: Okay. Thank you. So, I'm not sure how that confusion got started. All right. Thank you for allowing us the opportunity to address the Advisory Board on Radiation and Worker Health, in response to NIOSH's summary of its SEC Petition Evaluation Report.

We, the Petitioners, and by the way, with me here is John Elliott, one of the other Petitioners. We do have legal counsel with us, Arlene Violet. John's [identifying information redacted] is with us. And our health physicist is on the call as well, William Lorenzen, who was one of the health physicists during the decommissioning project in the 1990s.

We the Petitioners contend that the assumptions used in the NIOSH Evaluation Report are both inadequate and incomplete for the workers this Petition covers.

I will briefly review some of the

historical context, and the work practices of these employees, as well as the observations of a health physicist, that's William Lorenzen, who worked on the M&C site nuclear decommissioning project, that support our position.

NIOSH's analysis is based on the assumption that the principle source of exposure to members of the Class under evaluation is the residual surface contamination left behind in manufacturing areas where former atomic weapons facilities related operations were conducted.

And I tell you, that phrase appears at least a half dozen times throughout this report. That is their basic assumption.

This assumption is reasonable for your average production and office worker. But it is not reasonable for the Class of employees this Petition addresses.

A review of the work practices of the facility's maintenance workers, R&M workers, and specific production workers clearly shows that

they encountered what could only be described as gross contamination.

As the project manager during the M&C site nuclear decommissioning project, I can confirm that site characterization studies determined that source material originating from atomic weapons facilities related operations was released in an uncontrolled manner into subsurface soil, into drains, utility trenches, onto the roof decking.

Without getting into a detailed critique of everything Dr. Neton just described in his presentation, his statement that the Buildings 3, 4, and 10 were cleaned at the end of the operational period, circa 1967/'68, is misleading.

Our Petition provides evidence that there were significant quantities of contamination that remained inside on the site, that was later removed during our decommissioning project, in the '95 timeframe that he kind of

dismissed as a little more remediation.

Well, let me tell you, it was more than a little more remediation. Exhibit 6 of our Petition, which is an internal memo from [identifying information redacted] to the NRC Commission, documents large quantities of contaminated materials.

And I'm going to quote from that Petition very briefly, from Exhibit 6, which, what did I do with Exhibit 6? Ah, okay. Here it is, Exhibit 6. I'm sorry.

In this exhibit, on, and this exhibit is in our Petition. On Page 5 of that internal memo, [identifying information redacted]states, "The volume of uranium contaminated waste generated in the interior remediation project was 980 cubic meters, or 34,600 cubic feet of soil and concrete rubble. The exterior remediation projects generated primarily contaminated soil totaling 15,100 cubic meters, or 532,000 cubic feet."

So, I can assure you that this was much more than mere inaccessible surface contamination, as Dr. Neton would have you believe.

For over 25 years this contamination was never measured, monitored, or controlled. Because the source materials emitted primarily alpha radiation, which I'm sure as you know, can only be detected in close proximity to the source.

The released source material would have evaded the detection of any routine monitoring in a controlled manufacturing areas, such as what Dr. Neton was describing he used as the basis of his evaluation, especially given the remote locations where this contamination came to reside.

Yet, it remained present as an unknown hazard to maintenance and other workers who were completely unaware of the risks. Nor were they afforded any radiological monitoring or controls.

Proper management and control only began when it was eventually identified during the later site decommissioning project between the years 1992 and 1997.

Because of this, on almost a daily basis facilities maintenance workers, equipment R&M workers, and certain production workers were exposed to gross residual radioactive contamination, without any radiological monitoring or controls.

In the absence of these controls it is neither possible to know, nor estimate the bounds of the dose they received using the methods that NIOSH applied in their evaluation.

Here are some activities referenced in our Petition that illustrates the kin of conditions that resulted in exposures to gross contamination. This was, these actually, I'm paraphrasing the affidavit by my colleague John Elliott.

One, drain repair work where

maintenance workers were working in direct contact with contaminated residue in surrounding soils. No personal protective equipment or radiological controls were provided.

The drains were completely blocked with radioactive residue deposited during the atomic weapons program operational period. Please note that the drain survey, which is included in our Petition as Exhibit Number 1 documents that the concentration of uranium in these drains ranged from 10,000 to 50,000 picocuries per gram.

As further insult to these workers we have no measurement to their exposures to thorium, which would have certainly be present in the residues as well.

Two, rooftop installation of site services, where maintenance workers were showered by dust and debris every time they installed roof penetration for roof mounted equipment.

Three, cleaning contaminated

mechanical equipment preceding any lubrication tasks. Often cleaning included the use of compressed air, which obviously increased the potential for inhalation.

Four, working in the utility trench networks, in direct contact with radioactive contaminated residues.

Five, working on, in, and around manufacturing equipment that still contained pockets of residual radioactivity.

Six, working in direct contact with contaminated soils external to the manufacturing buildings, where radioactive waste materials had previously been buried.

All of this work was performed in areas where gross contamination was found, as demonstrated in the exhibits submitted in support of our Petition.

William Lorenzen, a health physicist during the decommissioning of the M&C site concluded the following, and I quote, "The SEC

evaluation that NIOSH conducted and used to determine that exposures could be bounded does not adequately evaluate the types of exposures and conditions experienced by the Class of workers."

Please note that in addition to his work at the M&C site, Mr. Lorenzen also worked as an operational health physicist for over ten years in uranium and source material facilities, both at the Watertown Arsenal, and at Nuclear Metals, Inc.

In his capacity as an operational health physicist he was responsible for monitoring the work and exposure of this very Class of workers, and gained first-hand knowledge and experience with how their exposures differ from those of the general workforce.

Mr. Lorenzen cites several factors that show the assumptions used by NIOSH were inappropriately applied to these workers, including, one, breathing zone proximity to

contamination.

Localized airborne clouds of contamination were generated by intrusive and aggressive processes used by these workers in performing these tasks, and/or generated by the extensive levels of contamination in and on the surfaces, and the materials that they worked on.

Two, contamination levels in and on the work zones, and/or the equipment, were much greater than typical work area surfaces, making resuspension levels very high.

Three, the physical nature of the work these tasks required increased the breathing rate above that seen during typical working conditions.

Four, the particle size distribution of the airborne contaminants generated from the invasive, destructive, and aggressive tasks would be significantly different than that assumed by the NIOSH resuspension methodology.

In conclusion, we contend that NIOSH's

evaluation of the SEC Petition is inadequate and incomplete. Because NIOSH's assumptions for estimating dose only recognize a small fraction of the total dose that this Class of employees received.

An objective review of the history, the work practices, and corresponding exposure scenarios for the workers in this Petition can only conclude that their exposures were never measured or monitored. And there is insufficient data to estimate a bounding value of the total dose they received.

The exhibits we submitted show an enormous quantity, as I mentioned, close to 20,000 cubic meters, that have been ignored by NIOSH in the evaluation.

We respectfully request that the Board assign an independent Work Group. I think you refer to it as the SC&A review, to objectively reevaluate the SEC Petition with a complete understanding of the nature of the exposures that

this Class of employees received.

We the Petitioners, and our health physicist, would be happy to work with the independent Work Group, if we can help clarify any of the facts. Thank you again for the opportunity to deliver this statement today.

CHAIR MELIUS: Okay. Thank you. So, any other questions or comments from the Board Members? Yes.

MEMBER ANDERSON: Yes. This is for the, that you had previous dose reconstructions. And you note here that one claim had internal dosimetry, and four claims had external dosimetry.

How do those measure correspond with your estimate? I mean, most of the rest of this is all done kind of without measurements. And these claims, is there anything unusual about them? Or what was actually measured? And how does that compare to what your estimates generate, you know?

DR. NETON: Yes. I don't know. I, we have to go back and look at that, to make that determination.

MEMBER ANDERSON: Why were these individuals --

DR. NETON: Yes. I don't recall.

MEMBER ANDERSON: Okay. Or what years?

DR. NETON: Yes.

MEMBER ANDERSON: I think these might be, I mean, there are very few of them. But it seems to be the only measurements you have for individuals during this period.

DR. NETON: Yes.

CHAIR MELIUS: Any other questions or comments? If not, I mean, again, this has already sort of come up for Members. But our usual procedure is to refer to a Work Group, and get further evaluation. Does that seem reasonable to everybody? If not, I don't think we need a vote to do that. Josie?

MEMBER BEACH: Well, I was curious. I was originally thinking it needed to go to the TBD-6000. But it probably could stand alone with a separate Work Group, based on what we heard from Jim today. I don't know if you've given that any thought.

CHAIR MELIUS: Either way. I'm not quite -- Dr. Ziemer and TBD-6000 people would be, might be happy not to have more to do right now. They're busy.

(Off microphone comment)

MEMBER ZIEMER: Well, I'm not, yes.

CHAIR MELIUS: So, we'll set up a Work Group. It's going to take some time, that's all. John is happy, whatever it took on that. Okay. Yes.

(Off microphone comment)

CHAIR MELIUS: The doc --

MR. ELLIOTT: Dr. Melius, I, forgive me for, if I'm speaking out of turn. But I don't quite understand the last discussion about

whether or not this is referred to, is it internal or external review group? Can you explain what you're thinking about?

CHAIR MELIUS: Yes. We have Work Groups that guide the evaluation, our evaluation. And we have a technical contractor who reports to us. But all that, the direction for that all comes from the Board. We don't refer it to outside independent groups for evaluation. That's not permitted under our, the way we proceed. So, we're just --

MR. ELLIOTT: Was there any question about that? Or --

CHAIR MELIUS: What?

MR. ELLIOTT: Was there a question about that?

CHAIR MELIUS: The question was about whether we have a, we have standing Work Groups that handle certain types of facilities. And then we have others that we refer to. We can set up a Work Group. The Work Group consists of

Board Members.

And what I was pointing out, if we do it independently it's going to take time. Because I have to canvass the Board Members, including those not here, to see who's interested and willing to serve.

MR. ELLIOTT: Okay.

CHAIR MELIUS: But, and some --

MR. ELLIOTT: Okay.

CHAIR MELIUS: And some of what we decide depends on how busy the standing Work Group is that would maybe usually handle this type of facility, and has handled many of them.

I think in this case, since they're back logged we'll set up a group. That will take some time to do.

MR. ELLIOTT: Okay.

CHAIR MELIUS: Yes.

MR. ELLIOTT: And obviously, we'll be notified however it's being handled?

CHAIR MELIUS: Oh, yes. You'll be

notified. And when there are Work Group meetings you're notified, and can submit information, and comment as to that process. So, it's an open process. All our Work Group meetings are.

(Off microphone comment)

CHAIR MELIUS: What? Speak. I mean, you can't --

MEMBER BEACH: I was going to say, Bill and I were just talking that we were both interested in this. And then Henry jumped in. So, anyway, hopefully you'll go by email, and the normal channels.

CHAIR MELIUS: No. It's not fair to --

MEMBER BEACH: All right. Because I think this is gearing a lot of interest in looking at this one.

CHAIR MELIUS: Okay. So, do you want to take it on? I mean, I can refer it to the 6000, what I call the 6000 group. Yes.

(Off microphone comments)

CHAIR MELIUS: Okay. Then, make up your mind here. Come on.

(Off microphone comments)

MEMBER BEACH: Yes. I only jumped in because I saw Henry grabbing your arm. And I'm interested in it as well. So, we'll leave it to you, Jim.

CHAIR MELIUS: Yes, yes. Okay. And meanwhile, I think we should task SC&A with doing a review, start their review. Hopefully they'll be in the midst of their review, and the Work Group can meet. And if there's other particular areas they want focused on, that's fine.

MR. ELLIOTT: And I was just, the last thing I'll make, and I promise I won't make another word. But I hope that whoever does the review will look carefully at the internal dose from, you know, direct contact with this gross contamination, you know, in all the places where it came to reside, the subsurface drains, the utility trenches, up on the roof decking, you

know, all the places that we documented in our Petition.

CHAIR MELIUS: They will receive the Petition, the, sort of the, what's the so called missing documents that you sent in earlier. If you resend them in we'll make sure that the contractor has those, as well as the Work Group Members, and so forth.

And again, you'll be contacted. And the SC&A, which is the contractor, or the Work Group may contact you about specific information. So, yes.

MR. ELLIOTT: That's great.

CHAIR MELIUS: Yes.

MR. ELLIOTT: Thank you, Dr. Melius.

CHAIR MELIUS: Yes, sure.

MR. ELLIOTT: And thank you to all the Board.

CHAIR MELIUS: Yes, yes.

MR. ELLIOTT: Thank you.

MEMBER CLAWSON: Jim, also, just so

you know, in the Site Research Database is all the paperwork. We've just been looking through it. So it, Josh did put it in there. But it's under the metals, it's under supporting documents.

CHAIR MELIUS: Not exactly helpful for us. Okay. So, I think that takes care of --

(Off microphone comments)

CHAIR MELIUS: Sorry. It's identified as -- So you have another, you're a problem there. We have eye problems, ear. So, it's identified as Board Public Comments and Comment Transcript Section. Boy, it's, the, it's almost as long as the document. Yes, okay.

I combine them all. That's all I have. And I have to hunt through them to find something. So there's no good way. So, anyway, let me go through this fairly brief, since everything's been responded to.

So, first we had a speaker who spoke about Carborundum. And Jim Neton responded to

that. I think that's JN, right? That. Next we had a person, the issue that came up about the non-SEC cancers, made comments I think fairly similar. Again, there was a response to that.

The next two are involving Argonne East. And again, those were both responded to. They're really the, essentially they're comments were being followed up on.

The, another one, the next one down, number 5, referring to Rocky Flats, actually a series of comments. And again, LaVon, that one really didn't need a response. That was essentially a request.

The next ones down, nine, ten, 11, were related to Pinellas. And again, were sort of general comments of really no response was necessary. That's referenced there.

Then Ted got one to work, and read comments from, related to Rocky Flats, regarding the Grand Jury report. Again, LaVon responded to that. And then from [identifying information

redacted]. Again, Ted read a, information again related to Rocky Flats, the magnesium thorium alloy issue.

And then Terrie Barrie made comments. And again, all referencing Rocky Flats. And those were all responded to. So, any questions or comments? I mean, still --

And then below that, again for Board Members, there's references to the transcript, the portions of the transcripts related to those comments. So, unless there's comments or questions, I think we've addressed what needed to be addressed in those. And --

(Off microphone comments)

MR. KATZ: So, we did have one Board correspondence related to ANL-East, from someone whose father worked at ANL-East, to the Board. This letter was encouraging the Board to consider the human factor basically in these decisions.

Mentioned a memo sent to NIOSH by an outside consulting firm, related to the radiation

dose information in the dose reconstruction program being used. And gave a little bit of other background.

But it's mostly, so, encouraging the Board's progress on this. And that for our, Argonne needs to be added to the SEC.

CHAIR MELIUS: And then, the other correspondence I think was shared among the Board was the, again, the lawyer referencing the issues regarding the non-SEC cancers.

Sort of a general letter that I think went to everybody. I think the Board, I will need to check and see if it actually got to other, the other groups about this. Ted?

MR. KATZ: It did. So, I shared that with OGC and NIOSH.

CHAIR MELIUS: Okay.

MR. KATZ: Yes.

CHAIR MELIUS: And I think if there is a, necessary for us to do a response as the Board, it would be saying that we would refer it

to them, since the issues relate to the regulations and the law.

MR. KATZ: Correct.

CHAIR MELIUS: Not our place to interpret those issues. So, I think that's it. And why don't we take a short break until 10:00.

MR. KATZ: Right. So, back at 10:00.

(Whereupon, the above-entitled matter went off the record at 9:31 a.m. and resumed at 10:01 a.m.)

CHAIR MELIUS: Okay. If we can get started and seated, quiet. Our next item on our agenda is Grand Junction's facility, SEC Petition and the presentation will be from Bill Field.

Grand Junction Facilities SEC Petition

(1986-2010; Grand Junction, CO)

MEMBER FIELD: All right. Thank you, Dr. Melius. There we go.

I'd like to start out by thanking the Work Group, Jim Lockey, Gen Roessler and Loretta Valerio, and also for the great assistance we've

had from Tom Tomes, Doug Farver and John Stiver.

So this is SEC Petition 00175, Grand Junction. And it's a U.S. Department of Energy facility in Grand Junction, Colorado.

Between 1943 and 1946, the Manhattan Engineering District acquired the Grand Junction site in order to concentrate triuranium, I guess that's octoxide.

From 1974 to '84, Grand Junction Facilities supported the National Uranium Resource Evaluation Program in the preparation of samples prior to analytical analysis.

And you can see here there were a lot of different projects over the years. Our main focus today will be talking about the time period after 1985.

Looking at a little bit about the chronology. On June 30th, Special Exposure Cohort Petition was received by NIOSH. On January 12th NIOSH drafted an Evaluation Report covering all onsite personnel who worked at Grand

Junction Operations from January 1st, '43, through July 31st, 2010.

February 24th the Board voted to recommend adding worker Class from March 23rd, 1943, to January 31st, 1975, to the SEC.

NIOSH informed the Board that additional work will continue for the time period January '75 through July 2010.

March 12, 2015, NIOSH drafted an Addendum to the Evaluation Report that addressed the time period from February 1st, '75, through July 31st, 2010. The Addendum identified insufficient information to fully reconstruct internal doses prior to January 1st, 1986.

March 26th the Board voted to add a worker Class from February 1st, 1975, to December 31st, 1985, to the SEC.

The Board then tasked SC&A to conduct a focus review of the Addendum and assess the appropriateness of the revised SEC time period and the adequacy of air monitoring and bioassay

data.

And Work Group Activities. We met on October, May 2016, or rather, May 2016, SC&A submitted a Focused Review of the NIOSH SEC Evaluation Report for Grand Junction Operations for the Addendum.

SC&A concluded the SEC time period beginning in February 1st, '75, through December 31st, '85, is appropriate based on lack of sufficient air monitoring data prior to 1986.

Work Group Activities focused primarily around one finding and there were two concerns. The finding was that there was insufficient workplace, there are insufficient workplace air monitoring data that support the assumption that unmonitored radiation workers would not have exceeded 200 DAC-hours or that non-radiation workers would have not, would have exceeded 40 DAC-hours in a given year.

The finding questioned whether Grand Junction had implemented a workplace monitoring

and worker bioassay program in 1991 that could be used to provide an upper bound intake for radiation and non-radiation workers.

Work Group Activities continued. Subsequent Work Group discussions did not resolve the issue. We discussed the issue for about an hour so we couldn't come to an agreement.

So the Work Group tasked NIOSH with determining activities in the 1991 era with the potential for generating significant air concentration data. And interviewing Grand Junction personnel and internal dosimetrist, I think he was interviewed twice if I recall correctly, for potential information about air sampling and the bioassay program.

NIOSH conducted additional searches of air monitoring records for the period of '91 through '93. NIOSH also interviewed a Grand Junction employee who had direct knowledge of work activities and monitoring programs that were conducted during the same time, during that time

period.

Based on the employee's interview combined with the identification of Radiation Work Permits, surveys, air monitoring records for specific projects requiring air sampling, it was evident that the monitoring program was in place at Grand Junction during the time period in question.

So Work Group Summary. The Work Group considers the additional information in NIOSH references and the records sufficient to conclude that Grand Junction implemented a monitoring and bioassay program in 1991 sufficient to identify workers who were exposed to the site's 10 percent Derived Air Concentration trigger levels for bioassay.

The Work Group believes the information available to NIOSH is sufficient to document or estimate the maximum internal and external potential exposures to all employees under plausible circumstances during the

specified period from January 31st,'86, through July 31st, 2010.

So it's our recommendation, it was a unanimous recommendation within the Working Group, based on the information in the original Evaluation Report and follow-up investigations, that Grand Junction Work Group recommends that the Board find radiation doses can be estimated with sufficient accuracy for employees of Grand Junction from January 1st, '86, through July 31st, 2010.

So I was wondering if Work Group Members had any additional comments at the presentation? No? And I'm not sure, there's a petitioner on the line?

CHAIR MELIUS: Yes. If the petitioner is on the line, you may make the public comments. You don't have to, you're not required, but apparently not.

MEMBER FIELD: Okay.

CHAIR MELIUS: Yes. Board Member

questions? Yes?

MEMBER ANDERSON: Yes. It seems like the data in 1991 shows they had it in place and does that also carry back to '87? What about '86 to '91? Was the same monitoring program in place or -- sounds very confident about '91 and beyond but what about that '86 timeline?

MEMBER FIELD: Yes, I think that was the period that was looked at. Is Tom on the phone? Maybe he can --

MR. TOMES: Yes, I am.

MEMBER FIELD: Okay. Could you provide some more details about maybe your discussions with the one employee?

MR. TOMES: Yes, what happened, we didn't discuss the 1986 time frame simply with that interview because he didn't work there at the time.

But we focused on the '91 because that was the finding from SC&A. But for 1986, we recommended that we assign the limiting air

concentration value starting in '86 based on the information we provided in the ER Addendum.

And SC&A concurred that the limit would bound worker starting in 1986 but in '91 we recommend that ten percent of that limit would be a bounding intake.

MEMBER FIELD: Thank you.

MEMBER ROESSLER: This is Gen on the phone. I could hear Bill talking and I could hear Tom but I've been unable this morning to hear much of anything from the speakers around the table. I wonder if your mics are working?

CHAIR MELIUS: I think they're working and they, yes.

MEMBER ROESSLER: I can hear you, Jim, but I could not hear the comment that was just presented that Tom answered.

CHAIR MELIUS: Okay. The person handling the audio is, yes, I think we'll try to address that.

MEMBER ROESSLER: Yes, it's been a

problem all morning and makes it very difficult on the phone to hear everything that's going on.

CHAIR MELIUS: Yes, I understand and they've been trying to address it and I think that's all we can really do.

MEMBER ROESSLER: Okay. Thanks.

CHAIR MELIUS: Thanks, Gen.

Other, oh, sorry.

MEMBER BEACH: Yes, my question has to do with the templates. SC&A recommended that once the template was updated it would be reviewed. Did that ever get done, Bill, do you know?

MEMBER FIELD: It's my understanding it was done but maybe Tom can confirm that.

MR. TOMES: We were waiting for the outcome of the Board conclusion here to update everything finally. I believe the intention is to make that a Technical Basis Document after we conclude the, wrap up the SEC Petition.

MEMBER BEACH: Okay. And then that

would be available for review after that?

MR. TOMES: Able to be available, yes.

MEMBER BEACH: All right. And then there was another, the finding on the insufficient workplace air monitoring with the DAC-hours for the non-radiation workers. It's, did that also get cleared up, that finding?

MR. TOMES: The limits of non-radiation workers?

MEMBER BEACH: Yes. I think it, the concern was the 200 DAC-hours and they shouldn't have exceeded 40. I just wanted to make sure that was clear. I didn't hear that in the comments.

MR. TOMES: Well, in our finds we addressed the fact that the ambient air concentration at the site itself was very low. And we came up with some numbers like left of one percent of DAC which falls below that number. And but the, obviously the bounding situation would be the ten percent DAC limit for the SEC

purposes.

MEMBER BEACH: Okay. And I brought up the templates because that's something that we don't really have a trigger at times to verify or look at those templates and it's been brought up before, so thank you.

CHAIR MELIUS: Okay. Just a reminder to the Board Members regarding our audio that you need to, after you speak or if you could all check, make sure your microphones are off because that makes a difference. If we all have ours on I think it limits the volumes of that. Any other Board Members with questions? I think this comes as a motion from the Work Group.

(Roll call vote)

CHAIR MELIUS: Yes, yes. So Ted will do the roll call.

MR. KATZ: Yes, thanks.

Anderson?

MEMBER ANDERSON: Yes.

MR. KATZ: Beach?

MEMBER BEACH: Yes.

MR. KATZ: Clawson?

MEMBER CLAWSON: Yes.

MR. KATZ: Field?

MEMBER FIELD: Yes.

MR. KATZ: Kotelchuck?

MEMBER KOTELCHUCK: Yes.

MR. KATZ: Dr. Lemen is absent. I'll collect his vote after this meeting.

Lockey?

MEMBER LOCKEY: Yes.

MR. KATZ: Melius?

CHAIR MELIUS: Yes.

MR. KATZ: Munn, Poston and Richardson are absent. I'll collect their votes after.

Roessler?

MEMBER ROESSLER: Yes.

MR. KATZ: Schofield?

MEMBER SCHOFIELD: Yes.

MR. KATZ: Valerio?

MEMBER VALERIO: Yes.

MR. KATZ: And I'm not sure, Dr. Ziemer sent me a note saying he'd be absent for a brief period. Are you back on the line, Paul?

Okay. I'll collect his vote too. But the motion passes.

CHAIR MELIUS: Thank you, Ted. Okay. It is 10:15. We're not scheduled to take up our next petition until 11:30. The petitioner is here. I don't, are you expecting other people on the line?

Okay. Then we will wait until 11:30. So we're on break again until 11:30.

(Whereupon, the above-entitled matter went off the record at 10:13 a.m. and resumed at 11:32 a.m.)

CHAIR MELIUS: Okay, if everyone could get seated we'll reconvene. And next we're doing Area 4 of Santa Susana, the petition. And first we'll hear from Dr. Lara Hughes from NIOSH. Lara, go ahead.

Area IV of Santa Susanna Field Laboratory

SEC Petition (1991-1993; Ventura County, CA)

DR. HUGHES: Thank you, Dr. Melius. This is the presentation for Area 4 of the Santa Susana Field Laboratory, SEC 235. This was an 83.13 evaluation based on a petition that we received.

So at this point I would like to acknowledge and thank our ORAU Team, the NIOSH contractor who did the most part of this work. Monica Harrison-Maples and Roger Halsey, as well as all the members of the team that did the data analysis, and also especially the data capture team who did a very good job tracking down data from the remediation period for this site because it turned out that in very recent years they had actually moved all the records off site and we didn't know. They were unresponsive.

So it took some effort to actually track the data down which happened just to be in Cincinnati. So it was very fortunate that we were able to capture 173 additional documents

dealing with the remediation period of the site and managed to review the data and also send the Evaluation Report to the Board within the amended 180 days which does not always happen.

CHAIR MELIUS: That's the first I've heard in a while.

DR. HUGHES: Right.

CHAIR MELIUS: Don't want to say that too loudly, but.

DR. HUGHES: So there are three previous Classes, SEC Classes, for Area 4, Santa Susana. The first was SEC 93. It was added for the pre-1959 period to the SEC that was done in 2009. It was based on lack of internal monitoring.

The next one was SEC 158 which expanded the Class to 1965, or end of 1964, also based on issues of internal monitoring.

And the last petition was SEC 234 which was an 83.14 Petition based on also again, issues with internal data, the infeasibility of

reconstruct internal doses from americium and thorium. This was presented to the Board in December of 2016.

The current SEC 235 does not recommend a Class. Now the previous three Classes actually encompassed the entire operational period of Area 4 so the current period that we looked at was actually only the remediation period.

Sorry. Okay. The petition was received on August 9, 2016 for the Class. The Class requested by the petitioner was all employees of North American Aviation to include corporate successors and self-contractors who worked at Area 4 of the Santa Susana Field Laboratory from December 31st, 1964 through present.

Now when this petition was submitted, we had not issued the latest SEC Petition 234 which we were working on at that point. However, it hadn't been presented and hadn't been recommended so there was a bit of an overlap

between our work and this petition that came in.

Now that we already knew that SEC 234 was going to be presented and hopefully be added so when we evaluated for qualification, we qualified, sorry, let me not get ahead here.

The cost we evaluated for qualification was all employees that worked during the remediation period. So when we looked at the remediation period to see if there was anything that would warrant qualification of this petition.

So what we ended up qualifying was all employees off the DOE, its predecessor agencies and the contractors, self-contractors who worked in Area 4 from August 1st, 1991, through June 30th of 1993. Currently we do not propose to be adding a Class.

The reason why this qualified -- now the petition had a lot of supporting documentation that we reviewed but it was almost in its entirely focused in the pre-remediation

period, the later operational period after 1965.

So whereas the petition itself, we found it not adequately support the defined basis for the remediation period which is really all that was left for us to look at.

We knew of this issue with CEP Controls for Environmental Pollution which was a bioassay contractor that the sites used as many other sites have in the complex.

It was suspected of data falsification at another site, not at Area 4, but what NIOSH is doing is we do not use any of the CEP data for dose reconstruction.

So because of this issue that we were aware of, we decided that the petition basis F.2 of data falsification loss or destroyed record would be in some form supported. And so we decided to look into that this issue needed to be looked at a little more.

Area 4 used Controls for Environmental Pollution (CEP) as the urine sample analysis

vendor from August '91 to June '93. We did some research into when the contract terminated and found that it ended in June 1993. And so this report really is evaluating whether or not we find that this omission of this data would have any impact on our ability to do dose reconstruction during the remediation period at Santa Susana Area 4.

A little claim overview. We have currently at NIOSH for dose reconstruction, 316 claims.

The total number of claims we have for workers who worked during this period that we're considering from '91 through '93, to '93, is 29. There are six of those claim workers started employment during that period.

Currently the number of DRs completed is 22. There's currently nothing active. The rest of them are somehow pulled or closed or in any, in some other form not completed with the DR. There's a reason for it. We looked at all

of them.

The number of claims that have internal dosimetry records for the evaluated period is five and the number of claims with external dosimetry records for this period is ten.

A little bit of background. You're quite familiar with the site by now. 2,850 acres, 50 acres total, located in the Simi Hills, Ventura County, 30 miles northwest of Los Angeles. It consists of four administrative and operational areas, labeled I through IV.

What's labeled Area 4 is about 290 acres and it's the only covered area. It also went by the name ETEC at some point. We currently try to stick to Area 4 because it seems to eliminate confusion.

The contractor during the '91-'93 period was Rockwell International. The processes, the operational processes was reactor testing and development. This went on from '55

through 1988. That was the operational period. So reactor testing, experimental reactors of various forms, fairly small reactors, the nuclear support operations that go with the reactor testing and energy research.

They also did energy and non-nuclear research and development. A lot of it had to do with liquid metal technologies.

The DOE remediation period is 1988 through present, well, it should be the beginning of 1989 to present, consisted of D&D of structures and components, the characterization treatment packaging, temporary storage of the radioactive and mixed wastes.

The highest exposure potential during the D&D period would be the SNAP reactor development facility D&D, as well as the dismantling and decommissioning of the hot lab, the hot cells, that were present at the site.

There are three facilities that are still operating, not currently but at the time of

evaluation, was the Fuel Storage Facility, the Radioactive Materials Handling Facility Complex, which is a complex consisting of nine buildings, and the Radiation Instrument Calibration Laboratory.

This is a little hard to read for pretty much everybody probably. I apologize. I thought it would come up a little larger.

Now on the left hand is the list of facilities and buildings. And if you see the red bars, is the operational period of the sites and the little vertical brackets to the right indicates the CEP Period.

And you can see there are three facilities still operating in a number of the open bars that aren't filled with the red consists of a facility that is still onsite but hasn't been decommissioned or dismantled or released. So there are still a number of facilities that they were working on at this time.

So Internal Exposure potential during the D&D period was a dust obviously from demolition operations removal of the reactor activated concrete, decontamination of the hot cell facility which would have all kinds of contaminants inside, fission products, activation products. So any unencapsulated radioactive material that was handled, stored, and packaged in the Radioactive Materials Handling and Disposal Facility.

The radionuclides of concern, transuranics, activation products, uranium compounds, limited thorium and plutonium and also fission products.

Now to Internal Monitoring Data available. The site had a state-of-the-art health physics program at the time. Not every worker was monitored for internal exposure.

They would limit the internal monitoring to workers that would enter high contamination areas or handling unencapsulated

materials.

They had air sampling programs so any kind of elevated air sampling would trigger a special sample. The routine in vitro and in vivo sample was routine depending on the job assignment.

So in August '91 they started a contract with CEP which handled all their routine urine analysis for uranium, gross alpha, plutonium, mixed fission products. What they did usually was the gross measurement and then they would follow-up if there was some kind of indication that it was a positive result.

Again, CEP was suspected of data falsification so we are not using this data. Again, the CEP data was baseline routine in nature. Air sampling was available for the same period also.

The site did in vivo counts that, in vivo whole body counts which were provided by Helgeson. They had a, what they typically did,

they had a quarterly type sampling that would alternate between in vivo and in vitro sampling for critical workers that they would consider having a high exposure potential.

So based on our previous research at NIOSH, we have a coworker model, OTIB-80, that is available and the period for the coworker model just ends just prior to the CEP period.

For uranium, the last interval that we are using for intake calculations ends in 1988. For plutonium it ends in 1986 and for mixed fission products it ends in 1991.

So what we did, we have the data that was coded and analyzed for the coworker model. We plotted this here. This is for uranium and this is the non-zero uranium results.

Okay. The gray shaded area on the left side of the graph is the CEP period. We omitted the data so what we did, we compared the available data from the time when we did the coworker model, this was still operational

period, with the data that was available, the bioassay data that was available after the CEP period, and plotted it on this graph to just get an indication of what the data looks like.

The data during the remediation period was not of sufficient quantity to be included in the coworker model. However, if you do a comparison, there's no indication that the data during the remediation period would indicate that.

So we did this analysis for uranium. Plutonium looks quite similar. So the data on the left is the data that was used for the coworker model, the non-zero plutonium results from all the workers at Area 4, Santa Susana, that were available to us.

On the right is the plutonium results that were collected after the CEP period and there's no indication that there was an increase. The same for fission products. Mixed fission products was done up until 1991 after the CEP

period. They changed to strontium-90 analysis mostly. Again the comparison works fairly well.

Same for gross alpha. It's no indication that the gross alpha values were higher than what's collected during the operational period.

In addition, this is a graph that shows the frequency of the whole body counts that were done. And as you can see, starting in 1991 the site increased their, the number of whole body counts they did.

So actually during those three years that we're looking at they actually did a whole, they did a lot of the whole body counts and then we think this was due to a Tiger Team report that happened right around that time and that they were somehow held accountable for like doing more of this type analysis.

So for the internal feasibility, we found that the lack of CEP in vitro data does not cause an infeasibility to bound internal dose for

monitored and unmonitored workers.

The comparison of remediation period bioassay data to the operational period data showed no indication that the coworker intake rates would not bound the exposure for unmonitored workers.

D&D and waste handling operations throughout the remediation period from 1989 through present remain consistent in procedure, equipment, and exposure risk.

During the CEP period the site was performing routine in vivo whole body scans with Helgeson. There were no measurable exposures.

In response to the DOE concerns with CEP data, the Santa Susana site initiated confirmatory resamples analyzed by the new contractor, Teledyne-Brown Engineering. These follow-up in vitro results confirmed no measurable internal exposures.

So this is our summary slide. I should also mention, of course external. We looked at

the external. We have generally not had an infeasibility issue with the external at Santa Susana and that has not changed during the remediation period. Workers were monitored for external. It shows that they were during the operational period.

A little bit of additional information for the CEP data, as you may recall, what we did in order to do the coworker model is we were able to get all the scanned internal data from the site. Anybody that was ever monitored for internal -- internal or external, the data was scanned for epidemiological study at some point and the site just did hand that over to NIOSH at some point.

We scanned the data. So we are actually able to look at all the individuals that were monitored during this three-year period and pull out, you know, everybody that was monitored by CEP and look.

So we have about 55 individuals that

are affected by this CEP issue. Overall there's around 90 people that were monitored for internal during this period. So we feel there is no infeasibility for internal or any of the external components for this period.

And that concludes my presentation. Any questions?

CHAIR MELIUS: Questions from Board Members? Josie?

MEMBER BEACH: Yes, I was looking at your whole body count and I know you said the Tiger Team, that may have been an indication of why they increased those whole body counts. But when you compare the work that was going on early, that middle section where there's not very many whole body counts, I was wondering if you could explain more of what triggered a whole body count. Was it an annual or was it triggered by something, maybe an incident?

DR. HUGHES: We are not sure. It seems somewhat -- we've been trying to find out

actually what, you know, caused this increase.

I think it might have been the D&D. You know, that they were more worried about activation product exposure, that type of thing. I'm not sure.

MEMBER BEACH: Yes, it is interesting, especially the time frame and the spikes and, yes.

DR. HUGHES: Well, I know for sure they were not doing it to counteract the CEP because they were not aware of the CEP issue until, you know, it was made public. I think that was all came to the open like in '94 period when they, once the site learned that the CEP was an issue. They issued statements to all the workers explaining what, you know, and that they were doing follow-up, that sort of thing.

But we're not exactly sure what triggered it. That would be my guess, the Tiger Team, but I'm not entirely sure so I guess I should have pointed that out.

MEMBER ROESSLER: This is Gen Roessler on the phone.

CHAIR MELIUS: Go ahead, Gen.

MEMBER ROESSLER: Lara, that was a very nice presentation and easy to understand. I do have one question and my slides aren't numbered. It's the one under the plutonium bioassay results where you're comparing the coworker data with the data, well, you're comparing the red dots with the blue dots?

DR. HUGHES: Right.

MEMBER ROESSLER: Yes. And the only one there that -- I mean, in all of those slides that you used previously that's pretty convincing. But this one, those plutonium results are really scattered and there's one up there and that's a log scale on the y axis. There's one dot way up at the top. I'd be curious to know what that was and --

DR. HUGHES: Right. That's the mixed fission products slide. Yes, we went --

MEMBER ROESSLER: Oh, there. I've got the wrong title there. Okay, it's the mixed fission products, right.

DR. HUGHES: Yes.

CHAIR MELIUS: Gen, you had me looking to find a blue dot on the wrong slide.

MEMBER ROESSLER: Yes, I'm sorry. I took the title above instead of below.

DR. HUGHES: We actually looked at that because I pulled up particular data for that because I wanted to know what's going on with it and it's a censored result.

And it's, I forget what the unit was, I think it was reported in microcuries and it's some, when I would convert it, it was very large and I'm not sure it, you know, we didn't throw it out because we didn't quite know what the deal was with it.

But at the same time it's a censored result. It wasn't labeled a positive so it's not a -- like one particular high result. I'm sure,

I'm sorry if that doesn't help. I'm not exactly sure what's going on with it.

MEMBER ROESSLER: But you did notice it?

DR. HUGHES: Yes. Yes, we did.

MEMBER ROESSLER: Okay. Thank you.

CHAIR MELIUS: Other Board Members with questions? Yes, Yes. Thank you for all the pictures. They really -- and the site timeline was very helpful. That's a really great graphic and maybe, Stu, you can remind some other people for presentations where you have a complicated site. It really helped us understand, us Board Members that are -- I wasn't looking at you, Tim.

DR. HUGHES: That credit goes to the ORAU Team. They came up with the slide and, yes, it's very helpful.

CHAIR MELIUS: Okay. Well, thank the ORAU Team then. And thanks for you and Stu for not, you know, taking it out, I guess.

Yes, Phil?

MEMBER SCHOFIELD: On these whole body counts, do you know what all they were looking for when they did them?

DR. HUGHES: Not sure, no. I mean, they would look for cesium, maybe cobalt.

(Off microphone comment)

DR. HUGHES: I think so, yes.

CHAIR MELIUS: We couldn't hear that, so.

DR. HUGHES: Oh, I'm sorry.

CHAIR MELIUS: Will Stu go, we couldn't hear Stu and I couldn't --

MR. HINNEFELD: I asked, were they doing fission product counting and she said she thinks so.

CHAIR MELIUS: Oh, okay. I heard her yes, I didn't hear what the yes was for. Okay. Brad?

MEMBER CLAWSON: Yes, Lara. I'm just looking at your whole body count and I like the two blips. But right there in the center where

there's nothing but you still had work going on in those areas, I would just, do we understand why there was a lack of whole body counts or --

DR. HUGHES: No, I'm not sure. I mean, they were still monitoring people for internal but they did mostly in vitro. At that time it may have, you know, been the contract issues. They didn't have a contract with -- they didn't have the onsite whole body counters so they had to have a contract with like the Helgeson or I think at some point they had -- I'm sorry, I don't remember.

(Off microphone comment)

DR. HUGHES: That's the SEC period, yes.

MEMBER CLAWSON: Yes, I just, okay.

CHAIR MELIUS: Okay. Any additional Board Member questions? If not, we'll thank you very much and very helpful presentation.

And petitioner?

MS. BLAZE: I'd like to thank NIOSH

and the Advisory Board for their work and effort on behalf of Santa Susan Field Laboratory and SEC 235.

I may have some information relevant to the site remediation increase in whole body count. So I'll just skip ahead for one second in my presentation.

I'm D'Lanie Blaze from CORE Advocacy for Nuclear and Aerospace Workers, by the way.

Rockwell International indicated a 40 percent increase of onsite radiation as a result of site remediation and DD&D. So that might help you guys with what we were looking at in response to Josie's question.

And it's my understanding that Department of Energy and Boeing have not disclosed all the site remediation, subcontractors, engaged in the ongoing decontamination, decommissioning and demolition of Area 4.

DD&D workers are currently being

automatically disqualified from this program because they cannot establish their presence at the work site and they have not been monitored for radiation exposure since transitioning to subcontract status and their work locations and their job duties did not necessarily change.

They were still doing DD&D but their radiation badges were taken away and their monitoring programs were discontinued.

So far, the Department of Energy has been unresponsive to FOIA and Privacy Act requests to identify subcontractors onsite and to obtain employment records.

Acceptance of SEC 235 for all workers onsite regardless of presumed work locations would be consistent with your decisions at GE Evendale, Rocky Flats, Oak Ridge Hospital, and Area 51.

It has been established that The Boeing Company routinely provides inaccurate and misleading employment verification summaries that

misrepresent eligible Area 4 employees as workers who do not qualify under EEOICPA.

Therefore, we cannot reliably identify work locations or rule out Area 4 employment.

New information not only raises significant questions about data falsification but further establishes that it is not possible to conduct dose reconstruction with sufficient accuracy.

DOE and Boeing claim that all Department of Energy operations, materials, and only a handful of easily identified workers were strictly confined to Area 4. So it has been assumed that Area 4 employment can be easily established or easily ruled out. However, persistent irregularities in the Boeing summaries have prompted a deeper look.

Now DOE and Boeing remain engaged in a 30-year controversial and costly environmental clean-up of Santa Susana, to which their obligations are significantly less if they can

downplay the perception of DOE operations that resulted in environmental contamination and worker exposure. And evidence strongly suggests that this agenda has interfered with EEOICPA.

Documents show since 2002, Department of Energy and Boeing have partnered to limit and control worker access to this program.

Their efforts to limit eligibility to a handful of workers hamstrung EEOICPA for three years as they argued with Department of Labor over who should be eligible.

DOE even tried to convince Department of Labor that Boeing should be able to decide who qualifies and should be able to withhold employment records and radiation data for any worker who doesn't.

In 2005, however, the national office expanded eligibility far beyond what Department of Energy and Boeing had in mind by declaring the entirety of Area 4 to be the covered area and by welcoming workers who may have rotated into Area

4 from other locations at the site.

Boeing agreed to assist Department of Labor by identifying which workers rotated into Area 4. They were permitted to create the Employment Verification Summary.

It has since been discovered that that summary falsely represents -- misrepresents Area 4 workers who have years or decades of covered employment as workers who should be disqualified from this program.

Moreover, evidence suggests that the summary was engineered to only identify some covered employment among that original handful of employees that DOE and Boeing initially intended to acknowledge, thus the decision to expand the eligibility has been undermined.

This tactic has dramatically reduced the number of claims adjudicated. Many are disqualified at the outset. Of the limited number that proceed to dose reconstruction, many arrive based on an incomplete depiction of

covered employment.

The summary may also obscure SEC eligibility, changes in job titles or work locations, incidents and exposures, all of which have direct bearing on accuracy in dose reconstruction.

We cannot determine how many viable claims have been derailed because of the summary. Any claim where some or all employment was disqualified based on presumed work locations is deserving of another look.

Why would DOE and Boeing try so hard to obscure worker rotation? Under the Freedom of Information Act, I obtained contracts and documentation showing Santa Susana Area 1 was allocated to DOE-ETEC Energy Research to support DOE Area 4 programs.

These Area 1 facilities accessible to all workers onsite, relied on employees affiliated with every area of the site. They routinely rotated between Areas 1 and 4 to

perform job duties at the related facilities requiring transport of personnel and materials across the site.

This created cross-staffing and undocumented worker rotation. Moreover, DOE-ETEC Area 1 and Area 4 research also relied on rotating personnel and facilities at Canoga and De Soto until at least 2005. Support facilities have also been identified in Areas 2 and 3.

This documentation not only validates an increased number of workers whose health was impacted by DOE operations, but it verifies DOE's presence, interests, and activities site-wide.

This could increase cleanup obligations tenfold before environmental findings, potential offsite contamination, violations of existing agreements with the State of California or the multimillion dollar housing developments next door are even considered, in addition to the expanded conditions and considerations at Canoga and De Soto facilities.

The NIOSH Evaluation Page 14 cited the DOE/EPA Former Employee Interview Report, but it failed to acknowledge DOE's Summary Table 3.0, and that shows how employees responded when they were asked what area of the site they worked in while employed by the contractor.

Out of 132 workers interviewed, only seven stated that they never worked in Area 4. 55 stated that they rotated between all areas.

In 2014, I provided NIOSH and the Board with all 300 worker interviews, wherein workers consistently expressed dismay that their Area 4 employment was never recognized under EEOICPA. We now understand that Boeing's summary is the reason.

Based on radiation records for these rotating workers who've been disqualified by the summary, NIOSH concluded that there's no good way to determine how long the worker was present in the covered area, the location of the monitoring in Area 4, or the duration of potential exposure.

Over the course of about 40 years, rotating workers were issued visitor dosimeter badges at Santa Susana, Canoga, and De Soto, and wore these badges for days, weeks, months, or quarterly periods without adequate tracking.

Personal radiation data is often withheld by Boeing and it is my understanding that NIOSH still does not have a reliable and usable database that contains the data for the monitored workers.

Boeing claims that its extensive employment databases date back to the 1940s. But when I suggested that we compare authentic employment records to their summaries, employment records started becoming increasingly difficult to obtain.

Since SEC 234 was passed, and particularly since I submitted information on Area 1, DOE and Boeing have not responded to numerous requests to verify employment for several new claimants. I've had to ask the

national office to subpoena employment records.

DOE states it has recently modified Boeing's contractual responsibilities to provide employment records under EEOICPA and the Privacy Act.

I've been given insufficient time to address these complex issues, much less to get into Boeing's inaccurate depiction of site history provided during the creation of the Site Profile, which has further compromised dose reconstruction, and on which NIOSH has based its evaluation of this SEC.

I provided NIOSH and the Board with a more accurate depiction of Area 4 facilities, operations, materials, and identified no less than 50 additional radiological facilities that were excluded from the Site Profile, along with all corresponding environmental data. Four Board Members left their copies behind.

I followed up with a 400 page PDF and supported documentation in an attempt to inform

the Board of these issues and I now submit documentation on DOE-ETEC operations in Area 1, the support cross-staffing, and worker rotation site-wide.

SC&A validated the existence of DOE-ETEC Area 1 Operations in 2008 in its review of the Site Profile and I ask that this be evaluated more closely.

If additional documentation on the summaries are needed, I'm prepared to present that with corresponding EEOICPA case ID numbers for your review in whatever format you guys need to look at that and if I need to redact it or just submit the case ID numbers, I can do that.

In closing, this is not DOE or Boeing's program. Their interests in an outside agenda must not interfere with this legislation. EEOICPA is a worker program and that's one reason why those who present information on the behalf of the workers should have more than ten minutes to do it, particularly when the Board

provides ample time to NIOSH as it presents information based on data created by the contractor.

I respectfully ask that you exercise your authority on behalf of Santa Susana employees by investigating these issues and by passing SEC 235 for all workers onsite. If I may provide additional documentation, I welcome the opportunity as well as your questions. Please add my comments to the docket. Thank you.

CHAIR MELIUS: Thank you. Any further discussion or questions from the Board? Okay. Any recommendations on what we should do with it and how we should handle this? Phil?

MEMBER SCHOFIELD: One thing that's still concerns me is, the D&D, is the fact that you looked at some of the reports put out by the State of California and the EPA, about hot spots around all areas of there and not just Area 4, it makes me question how extensive the D&D's been and how well-protected the workers are where

they're working on this. These hot spots seem to be all over the place.

CHAIR MELIUS: Okay. Josie?

MEMBER BEACH: I would like to recommend that the SC&A be tasked to review this ER and the Work Group take it up.

CHAIR MELIUS: Okay. Yes, I think it was a suggestion. I don't know if we need a formal motion on it.

MEMBER SCHOFIELD: I'll second that.

CHAIR MELIUS: Does everyone agree? No, don't second. We don't have a motion. But you agree with it? Phil, do you agree?

MEMBER SCHOFIELD: Yes, I do.

CHAIR MELIUS: Yes, okay. Gen or Paul, does that make sense to you?

(No audible response)

CHAIR MELIUS: Okay. So we will refer the evaluation to the Work Group so the Work Group can task SC&A in terms of following up, again, the focus being on the '91 to the '93, for

this petition. Work Group has, in terms of our actions here today.

MS. BLAZE: Dr. Melius? That was NIOSH's decision to limit the SEC Petition to '91 to '93 but I'd respectfully submit that these problems impact workers onsite from the outset of site operations to the present.

So my recommendation would be that considering new information about worker rotation, we really need to look at that information.

CHAIR MELIUS: Yes, but our charge is to review the recommendation from NIOSH and the Class that NIOSH evaluated. We don't --

MS. BLAZE: Is there a possibility that NIOSH can change their decision?

CHAIR MELIUS: Well, they can at a later point in time but not --

MS. BLAZE: Okay.

CHAIR MELIUS: But right now we're limited to what was recommended by NIOSH.

MS. BLAZE: I understand. Can you tell me to whom I should hand this new info?

CHAIR MELIUS: To NIOSH, would be the best and they can put it in the docket.

MS. BLAZE: Thank you, again.

CHAIR MELIUS: Thank you.

MEMBER BEACH: Is SC&A tasked now or is that something the Work Group has to do?

CHAIR MELIUS: I think that they should, that can certainly be tasked now in terms of the reviewing this report --

MEMBER BEACH: Review, okay.

CHAIR MELIUS: -- under that. I think if the Work Group has any particular instructions or whatever, Work Group, you know, Chair, whatever it can. But again, it's focusing on this report and that's our charge and so forth. Some of these issues have come up before. A lot of these issues that have been raised, you know, are mostly DOL issues in terms of employment verification and so forth and we're limited to

the facility and to -- yes, I know that, but just understood. Yes, yes.

Okay. Brad, you had your, are you just getting ready or -- okay. Anyway, thank everybody and I think we're at lunch break. So return here promptly by 2:00. We have a SEC and two reports to review -- hear about, not review but hear about.

Lunch

(Whereupon, the above-entitled matter went off the record at 12:14 p.m. and resumed at 2:03 p.m.)

CHAIR MELIUS: Okay, we will start. This is -- looking at the title, Evaluation of Monitoring of Subcontractor Construction Trade Workers at the Savannah River Site.

We'll start with Tim Taulbee, then we'll have Joe Fitzgerald. So, go ahead.

Savannah River Site SEC Petition

(1972-2007; Aiken, SC)

DR. TAULBEE: Thank you, Dr. Melius.

As Dr. Melius said this is the Evaluation of Monitoring of Subcontractor Construction Trades Workers at the Savannah River Site.

Before I get going I would like to recognize the work of Mike Mahathy. He is the one who put this report together, he and his team.

They did a phenomenal job of digesting a large amount of data. It was very tedious, but they did a really good job and I hope I do it justice here in the presentation.

So a little of background, the goal of this report, or this evaluation, was to determine whether subcontractor construction trades workers were sufficiently monitored for internal exposure to support coworker model development.

And so if you think back one of the things that we have been discussing for the past few years amongst the Savannah River Site Work Group was the subcontractor construction trades workers, whether there data was available.

There was some indication early on that their monitoring data might have appeared in what was called company files, and so it, you know, may not have made it into their personal files.

And so we were looking for a way in order to evaluate this, did this data, the monitoring that was done, did it make it into their individual files.

And as I indicated last year during one of the updates that in June of 2016 -- okay, we've got a -- apparently I've got slides on a timing issue here. Can I back out of this?

(Off microphone comment)

DR. TAULBEE: Oh, did you. That's all right, I can work through this, but it might jump on me here periodically and I'll get back to it.

Last year we located and captured a fairly large set of job plans with the 773A building over an extended time from 1981 to 1986, and what these job plans were was they covered

all off-normal work in the area, including operations work, DuPont construction work, maintenance work, is what I am calling that, and then the subcontractor construction work.

These job plans, because they covered all off-normal work, so if operations was going to clean out a glove box it was on a job plan. If they were going to remove trash from a cell that was on a job plan. If maintenance was going in to rewire something or to re-pipe something that was on a job plan.

But the routine work, the actual manufacturing of whatever they were doing, or the research they were doing, was not on a job plan.

So we had this set of job plans from which to look at, and here you can see some examples.

I'll talk about the one on the right here briefly, and this would be a maintenance job plan and you can see up at the top it's done by maintenance and this was to re-pipe a 125-pound

air pressure line on the face of Cell 11.

The job plan on the left was a construction job plan and it's to remove and re-pipe the cell inflatable seal line.

And so this is how we could go through these job plans and sort out whether it was operations, whether it was maintenance, or DuPont construction, or construction trades workers, and the construction would be the subcontractor construction trades workers.

So the monitoring at Savannah River, I'm going to talk predominantly here about the subcontractor construction trades workers, but I wanted to point out internal monitoring for construction trades workers, DuPont CTWs, or the maintenance folks, E&I technicians, was predominantly routine monitoring.

They were covered under DPSOL 193-302, but they also have incident data in there as well as some job-specific data. So they are predominantly routine monitoring, but when an

incident happened they would have follow-up bioassay just like anybody else would during a normal operations type of scenario and they would have some job-specific data.

The subcontractors also had routine monitoring. These would be subcontractor CTWs working for BF Shaw if they were the pipefitters, or [identifying information redacted] working as an electrician.

Some of them were on a routine monitoring, others were on an incident-based monitoring and/or job-specific monitoring, so it varied.

What we found in our evaluation is that the split was actually closer to 50/50 between the two from our random sample, and I'll get into that a little bit later here.

So one of the first things we did was we went through and sorted out those job plans and we identified, Mike and his team identified, 550 subcontractor CTW job pairings.

This resulted in 255 unique subcontract workers. So we pulled out all of the CTW job plans then looked at the names, entered them into a database, came up with 255 unique subcontract workers.

We randomly selected 110 of the subcontractors to go and do further follow up, and so this was a random sample. Mike didn't select these, a statistician went through and selected these 110 workers.

This resulted in 133 subcontractor CTW job pairings, okay. So what you will see is some subcontractors worked on more than one job during the time period.

We looked at the distribution of crafts during this to see if it was a reasonable random sample and what you see here from this particular slide is that the bulk of these subcontractors were pipefitters, electricians, and carpenters, they made up over 50 percent.

And if you think of the work that

would be done in 773A around the cells it would be a lot of re-piping, a lot of electrical work, and carpenters did a lot of framing and work within the rooms, repairs, and that type of thing.

And so that makes up the bulk of it, but all of the trades were really represented. We've got painters and ironworkers, sheet metal workers, laborers, millwrights, concrete workers, so we really have a nice distribution of all the subcontractor construction trades.

So once we have this 110 workers, last November Mike and his team went down to the Savannah River Site to look for the bioassay for these workers and his team found the bioassay data for 105 of the 110 subcontractor construction trades workers.

Now of the 133 subcontractor construction trades worker job pairings, 88 individual subcontractor CTWs were required to use a respirator, and this was our trigger for

internal monitoring that we used.

Now some bioassay results were found for the 105 workers, were from job plans that did not require respiratory use. We did not consider these, we sat them off to the side, we just looked at those that required a respirator.

Some bioassay results preceded the date of the job plan and were also not considered, we set those aside. So we only looked at subcontractor construction trades workers that were on a job plan using a respirator and we looked for bioassay data after that, within that specified time period of one year.

We did not look at tritium for any of this, this was all longer-lived bioassay monitoring.

So here are our results, the first couple of years, because we have so few, we've combined them together. And what you will see is down at the bottom, if you follow the totals,

that's the 133 job pairings.

Eighty-eight requiring respiratory use. And we found that 59 of the 88 subcontractors that were required to wear a respirator have bioassay data. This comes out to 67 percent of the subcontractor construction trades workers wearing a respirator have bioassay data.

We feel that this is reasonable. Well, why do we feel that this is reasonable for the development of a coworker model? Well, first, we use a distribution of bioassay data to develop the coworker model and then we typically assigned the 95th percentile to the unmonitored worker.

So 67 percent of the data is sufficient as long as there isn't a bias in the data, if you're not missing some of the high data or if you don't have, you know, if there is a bias.

Since we are using the 95th percentile

we were concerned are there high exposures or incident data present in the random sample, and the answer was yes, so we didn't find really any bias or evidence of bias.

To give an example of an incident bioassay data that we found, as I indicated some of these were positive, some of the monitoring for these workers was positive.

This was from an incident while painting in C-005, that's a room in the chemistry wing of 773, and in this particular bioassay the individual had a non-detect for plutonium, it's less than 0.1 dpm, but the americium was positive, it was 0.5.

Some of the bioassay that we found were from incidents and subsequent follow-up and these bioassays were negative. So we knew an incident happened, health physics required these people to go and leave bioassay samples, go and look at the results and they were negative.

In our report we listed examples of

these incidents that we found to demonstrate that, yes, higher exposed people were involved in it and are part of this dataset.

One of the individual's exposure was so high he is actually a part of the trans plutonium registry, so we do have high-level data within this dataset so we don't see any bias.

Okay. Another reason why we feel the 67 percent is reasonable for the development of a coworker model is we looked at the coworkers of these unmonitored workers, and by coworker I am saying on those job plans more than one worker would typically be listed, anywhere from two to 20 might be on a job plan.

And so when we looked at the unmonitored workers we went back to those 29, we looked at them and we found that 23 of the 29 had somebody else on that job plan that was monitored.

Now you can put a caveat on here, because that coworker could have been a DuPont

operations, could have been a DuPont maintenance worker or a DuPont construction, or it could have been another subcontractor CTW that didn't make it into our random sample, so it's a mixture of all of those.

But if you consider this additional part -- hold on just a second. I apologize for the interruption. Thanks, Stu.

So if you consider this additional data this increases from 59 to 82 of the 88 subcontractors, or 93 percent were either directly monitored or a coworker on the same job plan was monitored for this group of people that we sampled and looked at.

Another reason why we feel the 67 percent is reasonable for the development of a coworker model is respiratory use is a reasonable surrogate for the need for internal monitoring, but not all respirator use requires bioassay.

Some respiratory protection is precautionary, you'd put people in respirators in

case something happens of if contamination is unexpectedly encountered.

If there is no contamination then there is no potential for an intake and bioassay is not necessary. So was wearing a respirator really necessary in all these cases? Well, yes and no.

The yes part is as precautionary, absolutely, and I'll show an example here in just a second, but on the hindsight when no contamination was found do they really need to wear a respirator, not necessarily.

Health physicists in general are conservative in an effort to prevent intakes of radioactive material. In a good radiological safety culture we would rather have a worker in a respirator and not need it than a worker need a respirator and not have it, okay.

So you're going to tend to overuse respirators intentionally to prevent intakes. So let me show an example where bioassay was not

necessarily needed, and let me read this particular example here, it's very difficult from the screen.

But this is from a radiological survey logsheet of the High Bay Area behind the trans plutonium fuel facility in the basement of 773A. This was written by the rad tech at the time.

"Surveyed for construction pipefitters to complete jobs started yesterday. OGE line," that's the off-gas exhaust lines, this would be a contaminated line, "was bagged up and cut into two sections.

"No problems were encountered. Construction and operational health physics wore two pair of white coveralls, cloth and plastic shoe covers, cloth hood, rubber gloves, and full-face respirator for the job.

"No transferable contamination was detected during the job. Impactor air sample taken during the job calculated to less than 0.2 times ten to the minus 12 microcuries per cc."

That's less than 10 percent of a DAC. So in this particular case they were going to be cutting into the off-gas exhaust line. This would be a potentially contaminated line. You are absolutely going to put people into a respirator.

Before you've cut into any of these lines you're going to try and flush them. Apparently the flushing did quite well because when they cut into it they didn't find any contamination.

They had an air sampler set up there in the workplace, this would be a portable stanchion air sampler, and according to past interviews with RTCs they were set at nose height.

It recorded no activity, it was less than detectable, so they are less than 10 percent of the derived air concentration. So did they really need a respirator for this job? Well, I think they did because they were cutting into a

contaminated line, but was there any contamination, no, so there's no potential for an intake.

So considering this type of scenario did the rad tech then require them to submit a bioassay sample, they may not have. So this 67 percent that we're talking about to develop a coworker model we feel would be reasonable, especially if you applied the 95th percentile to the workers in the particular case where there is no evidence of an intake.

The fourth reason why we feel the 67 percent is reasonable for a coworker model is there will not be 100 percent compliance with bioassay monitoring of subcontractor employees.

This is currently in programs today. There is limited ability for health physics to enforce bioassay compliance. About the only tool that they have is to restrict somebody from going into an area again if they didn't leave a bioassay sample.

You can put them on a restricted list and they can't go in again. That's about the only tool that you really have to keep them, or to compel to leave bioassay samples.

Some workers are going to refuse to leave a bioassay sample. I have worked in construction from the time I got out of the Army, before I started college, and my dad was a construction trades worker for 42 years running heavy equipment, my uncle was a boilermaker for 45 years, I've been around construction work all of my life.

I can tell you that you are not going to get 100 percent out of this particular workforce, or really any workforce. If people don't want to leave a sample they're not going to.

We showed some examples to the Work Group last week where a couple of workers, subcontractors, refused to leave bioassay. One of them stated they were exercising their right,

the other one indicated time was money.

So 100 percent is really not possible. Also, subcontractors might move to another job and not return. So you restrict them, they don't really care, they're not coming back.

The question before the Board is: how much data is sufficient to support the development and use of a coworker model for dose reconstruction? And that's something that, and I hope you all will consider and deliberate on and discuss as to whether or not this is, you know, what level of compliance really is necessary.

So in summary, 97 percent of the subcontractor CTWs were monitored for external dose. I didn't present that here, but it is there in our report.

Sixty-seven percent of the subcontractor CTWs were monitored by bioassay. Thirty-four of that 67 there is routine monitoring, the remaining 33 percent were incident-based or job-specific. It does say on

job-specific, but it should be or job-specific.

When you consider the unmonitored an additional 79 percent of those unmonitored subcontractor workers had a coworker on the same job plan that was monitored with bioassay, which would raise that to 82 of 88 subcontractor CTWs had either personal monitoring or a monitored coworker.

So our conclusion is that radiation dose to subcontractor construction trades workers may be reconstructed with sufficient accuracy using either the routine, they're incident-based, or job-specific bioassay monitoring data available for the individual worker.

Remember, 67 percent of these subcontractor workers have monitoring data, or we can use coworker data or a combination of the two, whichever may be higher.

Radiation dose to the unmonitored subcontractor construction trades worker can be bounded using the 95th percentile of the coworker

distribution developed from the monitored construction trades workers.

So what we are saying basically is if you have six construction trades workers on a job and four of them are monitored, we're saying that we can use the 95th percentile to estimate the dose for the two that didn't leave the sample.

That's what we are effectively saying with the 67 percent. And that concludes my presentation on the evaluation of the subcontractors.

Before I go on to the status of issues I think Joe should give his talk and we should discuss that some and then we'll go on to the other issues. I'd be happy to answer any questions.

CHAIR MELIUS: Yes, before Joe, Board Members have questions? Yes, Josie?

(Off microphone comment)

CHAIR MELIUS: Okay, go ahead.

MEMBER BEACH: First of all, on Slide

Number 5, I was trying to capture these. Give me one second.

DR. TAULBEE: The pie chart?

MEMBER BEACH: The pie chart, yes.

DR. TAULBEE: Yes.

MEMBER BEACH: So looking at that pie chart and you pointed out several times that all the subcontractors are captured, there is a category of other that takes up a good portion of the pie chart, who fits in that category?

DR. TAULBEE: Mike Mahathy, can you help me out on that? I believe it's construction trades workers not listed there.

MR. MAHATHY: Yes, they're construction trade workers, that includes construction category -- let me get this slide up so I can --

MR. KATZ: Mike, you were very hard to understand.

MR. MAHATHY: Okay, sorry. Yes, I am looking at it now. Those were, they had down as

just as construction, so there were construction workers but not specified.

DR. TAULBEE: Okay. So those would be unspecified construction workers?

MR. MAHATHY: Yes.

DR. TAULBEE: Okay.

MEMBER BEACH: Okay. That's a big piece of the pie there, so that concerned me a little bit.

DR. TAULBEE: Actually, it's not, Josie.

The other is the one just to the left of the red at the very top. This goes clockwise around.

MEMBER BEACH: Okay, so it's not the orange section over here?

DR. TAULBEE: No, the orange section is electricians.

MEMBER BEACH: Okay. Okay, thank you. It's hard to see that.

DR. TAULBEE: Yes, if you read around

like the clock --

MEMBER BEACH: Okay. So there could be a few people that are in that section that might be hard to determine who they are?

DR. TAULBEE: That's correct.

MEMBER BEACH: Okay. And then on slide 7 -- should I let someone else -- okay, I'll just finish my questions.

CHAIR MELIUS: Yes, go ahead.

MEMBER BEACH: So this date, I just want to be clear, is from '80 to '86, what data do you have for the rest of the period, the '89 to '98?

DR. TAULBEE: We did not have job plans for that time period. This was the only time period that we had what we felt were a complete set of job plans for a specific area that was readily available and that's what we sampled from.

MEMBER BEACH: Okay. And two more questions, Jim, and I'm -- so last year you were

saying 75 percent was what you needed for bioassay data to do an accurate coworker model, today you are at 67 percent?

DR. TAULBEE: The 75 percent was a ballpark asked by Brad of what did I think might be and we just basically came up with -- I was thinking if you've got a Work Group of ten, two to three construction trades workers might not comply.

It was a guess, but it was something I was asked and we threw out 75 percent. And looking at this data, when you consider all of the other information that I presented there, the one through four of additional follow-up and including the other coworkers, I am fully comfortable with the 67 percent, or slightly over two-thirds.

MEMBER BEACH: Okay. And then, last question, on slide 15, my math needs some help here. Sixty-seven percent of the subcontractors had routine bioassay and then the next bullet you

talk about the additional 79 percent remaining unmonitored subcontractors, so can you kind of explain that?

DR. TAULBEE: If you look at the 29 unmonitored subcontractors, okay, 23 of them, or 79 percent, had a coworker on the same job plan that was monitored.

MEMBER BEACH: Okay. So you are saying that --

DR. TAULBEE: Seventy-nine percent of the remaining unmonitored subcontractors.

MEMBER BEACH: So you're going to have to rely on your coworker that you worked with if they had bioassay and you did not?

DR. TAULBEE: That would be correct.

MEMBER BEACH: And that's going to make it into their records and it could potentially be more than several people on one job?

DR. TAULBEE: This is why in our conclusions we specified here that we felt the

dose reconstruction could be done with sufficient accuracy using a combination of their individual data, the coworker data individually, or a combination of the two, whichever would be higher.

The coworker model data, their data, and the coworker model data to fill in if you wanted, whichever would be higher.

MEMBER BEACH: Okay. That gets very complicated. So, okay, thank you.

MR. MAHATHY: Dr. Taulbee?

DR. TAULBEE: Yes, go ahead, Mike.

MR. MAHATHY: I was going to point out that the 79, it's not 79 percent of the whole, it's 79 percent of the ones that remained, so that's a small number actually.

DR. TAULBEE: Yes, it's 23 of 29.

MR. MAHATHY: Right, right, okay.

CHAIR MELIUS: Yes, Brad, then Dave Kotelchuck.

MEMBER CLAWSON: There is a lot of

information here, Tim, and we've been doing this for a lot of years now.

The thing that really bothers me on this is slide 15, because when we're getting into this we are relying on the other coworker to help with the coworker model to make the coworker model work for the subcontractors.

The thing that really bothers me about this is we did this for one building and we have an entire site to be able to do this with. It's already taken us how many years to be able to get to this point.

Myself, you feel confident with 67 percent, and my personal opinion is that it is not. I have an awful lot of problem with us relying on other coworkers to make the coworker model work, but we'll work through this.

I just want to voice my concern with this.

DR. TAULBEE: May I respond to that?

I understand some of your concern

there, Brad. With these additional coworkers, these people would be part of the dataset that we would be looking at.

When we were looking at the dataset, we are looking at large datasets, okay, in our random sample we selected individuals, okay, these other coworkers would be part of that group, and that's what we would be doing.

So we're not looking at the coworker of a coworker, we are looking at the total dataset that we've got and we'd be taking the 95th percentile off of that and applying it. I just wanted that to be clear.

MEMBER CLAWSON: And I'd like to respond to that. I understand what you are saying. I want us to keep in mind why we have SECs, if the data isn't there, the data isn't clear.

This is why we have it and I really -- we've been fighting this fight, especially with coworker models, this is, if I remember right,

this is almost the sixth different shot that we've taken at these coworker models and I just, I do have a problem with it.

CHAIR MELIUS: Dave?

MEMBER KOTELCHUCK: Yes. Going over this I am concerned about the issue of bias in the selection of the people. Let's go to the bias in the selection of the exposures. Let's go to slide 15.

A lot of these, it appears, other than the DuPont are small contractors and what worries me is that folks who believe they have a high level of exposure might simply walk away figuring that their employer, either their employer might fire them for "doing a bad job" or "not being careful," or they may worry, I assume since the Savannah River Site is a major employer in that area that a number of the tradesmen who are working in construction might hope to get a job in the future with the company and they don't want to have a record of having heavy exposure on

the job.

Now a lot of what I am saying is essentially sociological, and it's hard to know how to pull out what's going on. There are certainly experiences elsewhere in other sites that people over the years in the industry where the levels were high, if you will, tried to do things to keep down any observation that they were heavily exposed.

So I am worried that the people in the highest level of exposures might simply have walked away. One possible way, or one possible piece of information that might be able to sort things out is DuPont's a major company and people, I expect, who are working for DuPont want to continue to work for DuPont.

DuPont may well have enforced their rules about people leaving bioassays more than the small subcontractors, and half the people are DuPont and half are other subcontractors.

Possibly there is some way of

comparing the DuPont and the non-DuPont to see if there is any difference in the kinds of exposures that are reported by people in those areas.

DR. TAULBEE: That was actually requested to us by the Work Group this past Wednesday during the call, was to compare the 95th percentile of the DuPont construction trades workers and the 95th percentile of the subcontractor construction trades workers, so we are going to work on doing that in the coming weeks and months.

MEMBER KOTELCHUCK: Oh, good, good.

CHAIR MELIUS: Okay, let's stop the questions for now because we have other presentations and limited time. So, Joe.

Joe Fitzgerald from SC&A who has been evaluating this in a slightly different approach.

MR. FITZGERALD: Yes. Good afternoon, Dr. Melius and the Board. First off I want to acknowledge, I guess Greg Lewis left, that's too bad, because actually he did quite a bit of work

along with the Site to make our two site visits possible and it was a big resource issue, so I just want to give him a kudos even in his absence.

And, likewise, as I did at Work Group, just recognize Tim and his team. We had to kind of learn off their nickel, in terms of some of the protocols and the data availabilities at Savannah River and I think it was useful seeing that he and Mike Mahathy had started a few months before we did.

That really got us jump started, so that was really helpful and very collegial, and I appreciate it.

Yes, as Dr. Melius said, in September of last year we were asked to do a slightly different cant on this thing, even though we did borrow from the concept of looking at a job plan, in this case we looked at RWPs to look at, you know, the bioassays, to pair bioassay results for a completeness analysis.

The notion was to look broader. So what we were doing, we used a number of different approaches, a computerized system called EDWS, which we had access to at Savannah River, it's an in-house search engine for their documentation and record, using that as well as some files that NIOSH had as well as some physical onsite searches.

What we were trying to do is, frankly, locate as many RWPs for the SEC period, '72 through 1995, and use those RWPs, select from those RWPs to span a representative group of facilities, of timeframes, and operations just to get a more diverse sense of this question of completeness and adequacy, and I think it was very helpful to do it that way.

We identified in the end RWPs for 1982 to '95, and I was somewhat surprised, but in retrospect I think there's a pretty good explanation for it.

We found most of the radiological work

permits for the 1989 to 1995 period, the ones that were in fact most prolific with the numbers of CTWs or subcontractor CTWs identified, and a lot of this that I point out here corresponds with the Westinghouse early tenure at the site.

They started in '89 I believe at the site and certainly that coincided with a lot of upgrades as far as formality of the program. Westinghouse instituted a lot of their procedures, a heavier reliance on radiological work permits, more formalization of procedures and those kinds of things.

Also, at the same time was a much more expanded use of outside subcontractors. The restart a K Reactor, that effort was going on, involved a lot of construction trade workers being brought in to basically do a lot of the construction upgrades at the reactor.

And, I -- You know, I think Tim was pointing out that tritium didn't figure in his review in the high-level case, but because this

was a K Reactor, a tritium production reactor with, you know, certainly residual contamination it was the converse for us.

Actually, tritium figured more prominently in the RWPs that we saw for that period.

So, anyway, we did onsite matching of what we found, the 306 identified subcontractor CTWs with matching records, which were basically either on electronic fiche or hard file, and this was with the support of the Savannah River internal dosimetry staff in terms of giving us access to all that.

And we chose -- this is a little different, we didn't look at respiratory protection as the trigger, but we essentially looked at whether or not we could identify within the 30- or 90-day period following the RWP job date, in fact, a bioassay being recorded as a result.

And since we were dealing roughly with

75 percent of the RWPs targeting tritium, certainly a 30- or 90-day made more sense than a year. You obviously wouldn't see much after a year if it was a one-time tritium exposure, so I think that was the approach we made.

And, again, looking at over 300 and given the timeframe and the resource limitations at Savannah River I think this was probably the best approach as far as getting results in terms of pairing and looking at the question of completeness.

Now surely if we had more resources and more time at the site I think we could be more specific, but I think this was probably the best we could do to come up with the result that we are looking for.

I think Tim went through this list, and I won't go through it again, but just to give you an idea of the different crafts that were involved in these RWPs. This was sort of the scope of what we saw in the RWPs that we were

looking at.

And, I guess, again from our experience were taken aback a little bit. This is the 1990s, we were going into this thing thinking that we would have a pretty uniform set of RWPs, we would have target nuclides, we would have specific dates, we really didn't think this was going to be an issue or a question of, you know, having a benchmark to compare bioassays against.

So we were I think surprised and I think we had to adapt, to some extent, to the fact that we had several different forms of work permits, some of which were specific and explicit about the end-of-job bioassays, some which were unclear, unfortunately, with target nuclides, some of which were, as we found, did not even have a date.

So we had to go and cull out the ones that were just not useable, but even the ones that we ended up having to use, again, they were

not the uniform set that we were hoping for.

And, again, that kind of compelled some change in the way we presented our results and when we get to the results you'll notice that we presented two sets, essentially, one set that were from RWPs that were much clear, much more explicit, others that were a bit more general, and I'll give you more information on that.

And I said earlier, of the 243 subcontractors that had bioassay results within the 90 days that we were looking at, three-quarters were ones that had tritium identified as the target, about 20 percent had plutonium, and the balance were mixed fission products, uranium and whatnot.

And these are our results. In terms of, and this was another thing that we were going to look at, the question of whether records were just not identifiable at all, and initially we were particularly concerned because we had a relatively high number. I think it was 18 or 19

that the dosimetry staff at Savannah River could not find.

But as it turns out, you know, because we are dealing with handwritten records, the dosimetry staff is used to going through a number of permutations, and it's very possible after a while that you can actually identify some of these folks just by doing comparisons, doing matchings from earlier years, trying different numbers, and as it turns out we were able to identify all but five using that process as far as identifying the workers against the bioassays.

So going from that, looking at the 306 total RWPs, and this is the whole mix of the different kinds of RWPs that we're using, I found this surprising.

I didn't see Tim's results, but we came up with about 34 percent were missing, completeness about 66 percent. This is using the 30-day benchmark. At 90 days that becomes 80 percent complete, 20 percent missing, and this is

for, again, the total number.

So we're narrowing this down to the 197 that had -- were clear, end-of-shift bioassay requirements, not with some of the ambiguity on some of the others, that number was 71 percent complete for the 30-day period and 84 percent complete for 90 days. So, again, that's the spread of what we found.

Now at the very end of this cycle, this is, in fact, after we got the data and after we had crunched the data and were preparing a report, I got access to the Noncompliance Tracking System at DOE and I was doing some searching, this is actually a very searchable database, and I looked at Savannah River and, again, I was a little taken aback because I had not been aware of the '98 Notice of Violation and when I looked at it I was concerned that, actually it was very relevant, I think, to this overall review and, you know, it's too bad that search wasn't done six months earlier because I

think we could have addressed it in a more early sense.

And, again, all we had available to us was the Notice of Violation itself, what was on the NTS as well as the enforcement letter, which I made a copy for you.

The hyperlink that was listed in our report turned out to be in error, so I wanted to make sure everyone at least had a copy of the letter. That doesn't have the attachment. That hyperlink has been corrected since, so that's out there.

But the Westinghouse/Savannah River in '98 was cited under 10 CFR 820, and that's the -- I think it's the Quality Assurance reg, for deficient work processes, respect to full worker adherence to establish WSRC bioassay requirements, and I parenthetically mention that action was deferred under 10 CFR 835, which we have talked quite a bit about.

Again, in the letter, and I don't want

to dwell on all of the aspects addressed in the letter, I think DOE acknowledged that, in fact, Savannah River had some pretty robust field indicator programs that looked at, you know, evidence of intakes, evidence of contamination in the air, and I think DOE took that in consideration and the citation was for 820 rather than 835 and the action was deferred under 835.

Anyway, Westinghouse, and this is in the letter, found worker nonparticipation, job-specific bioassays, that shouldn't be '95, that was actually May of '97, so there was actually two surveys, May of '97 and September of '97, but in the May timeframe they found 67 percent nonparticipation.

That's sort of a flip from what Tim and I were discussing. It's not a 67 percent participation, but the other way around, 67 percent nonparticipation. Apparently, that was a limited sample.

Later in '97, the same year, and this

was on the heels of those results, Westinghouse did a complete survey of all the RWPs for the second quarter, this is job-specific RWPs to be explicit about it, for the second quarter of '97 and they evaluated that and issued the results in September that found that 79 percent, in fact, did not provide results and that figured prominently in that NOV in terms of the citation and the follow-on of that.

There was a whole series of corrective actions that Westinghouse committed to. I'm not going to go through all of the details, but essentially revamped the overall program, the training, the forms that were being used.

It was interesting that one of the issues was fixing the RWP forms, clearly making that more uniform, having check-offs and having the information be more uniform in those forms.

So that kind of explained to me a little bit of why we were having such a hard time before that.

And I also mentioned that Westinghouse undertook a re-sampling of the 1997 missing CTWs. I think as NIOSH pointed out in the Work Group meeting, it's 256.

Two hundred and fifty-six CTWs were, they did re-sampling and the re-sampling showed no measurable intakes for those workers for that timeframe. So these re-samplings were done following the results that were achieved.

I guess the bottom line is this, you know, clearly we felt this has some important implications for this question that we are addressing, and NIOSH, as we heard in the Work Group, is conducting a further follow-up with Savannah River to get more information to establish if they did anymore re-samplings, whatever.

Again, we didn't have time to do any follow-up. This was something that we wanted to bring to the Board's attention, to NIOSH's attention. It factors into this whole thing,

but, you know, again, this was very late in the game.

And, finally, conclusions, we were tasked, frankly, last year to take the review in a broader sense to answer the question how complete is the subcontractor CTW bioassay database, and our conclusion is that given the results that we found, which is the 16 to 34 percent missing, and I'm not getting into of the strategies for mitigating against that, just looking at the issue of how complete is it, our conclusion was it wasn't complete, it wasn't sufficiently complete.

We also felt that the NOV findings in '98 are of real concern because, frankly, those metrics are even worse. So it certainly raises questions for the Westinghouse era.

We don't have enough documentation before '89, frankly, to talk about the DuPont era except for what NIOSH has done in the early '80s, but certainly it raises some serious questions

about the adequacy of the data for job-specific bioassays that were conducted in that '90s timeframe.

Now the corrective actions were taken and put in place by the end of '98, so certainly Westinghouse tackled it pretty promptly, and looking at the NTS database we did not see any further citations or any further results that spoke to conformance issues after that date.

So after December '98 there didn't seem to be any further issues that we could actually establish.

And to echo to some extent what I think Tim just said, it does come down to how complete is complete, a question that I think actually Jim Neton raised at one of the earlier Work Group meetings.

You know, our conclusion is based on the fact that we felt 16 to 34 percent, certainly from our standpoint, isn't complete given the tasking that we got, but, again, I think the

Board will have to address that issue.

That's the end of my presentation unless there is any further questions.

CHAIR MELIUS: Board Members with questions?

(No audible response)

CHAIR MELIUS: Okay. And I think Tim had a few slides to finish, if you could do that quickly, Tim, please.

DR. TAULBEE: Yes. Okay, to finish up here I just wanted to give a little bit of the status of the issues. This is what I have been giving for the past multiple Board meetings.

These are kind of where we are at with our deliverables, and as you can see we have delivered all of the work products that we had committed to with the exception of the full OTIB-81, the full coworker model.

And what I have got here on this particular slide is also the time period when SC&A has provided us comments and we're going to

be trying to track this through when we get the SC&A comments and then we'll respond to them, and so we'll be keeping this particular table here updated for the Board as requested.

To give a little bit of a summary on where we are at with the coworker models, this will be Revision 4 of OTIB-4 to contain all of the remaining radionuclides of interest.

The data completeness and QA verification has been completed. The final modeling is progressing and the current schedule of completion, delivery to the Board, will be November of this year.

I have listed next the current work following last week's Work Group meeting, and the first thing is to respond to the findings from SC&A reviews of documents submitted to the Work Group, and this would be both under the SEC issues Work Group as well as the SRS Work Group.

We are focusing right now on the coworker model issues and providing some of that

feedback based upon the Work Group meeting last week.

We are developing responses to SC&A's report on the subcontractor monitoring. We do have some concerns with that and we would like to address those and get them in writing to the Work Group.

As I mentioned earlier to Dr. Kotelchuck, we are assessing the distributions of the DuPont construction trades workers versus the subcontractor construction trades workers.

And then as Joe indicated in his last slide we are doing a follow-up with the site regarding the '95 to '97 assessment on internal bioassay monitoring that led to the Notice of Violation of 10 CFR 830, which is the Nuclear Safety Management Section which follows the QA.

And we have made that request to the Site, they are working on providing us with their full packet of information, their corrective actions.

It appears based upon the Notice of Violation that Joe pointed out that they did assessments in '95 and '96 and '97, and so we are definitely interested into whether they did additional ones prior to this time period and whether they did re-sampling of the individual workers.

Because as Joe pointed out in one of his slides there about does this nonparticipation actually equal missing data, if they did re-sampling that data then would be in the dataset that we could use to develop a coworker model.

So those are questions that we are certainly going to try and answer and we have made the request from the Site. So that's where we are currently at.

We hope to have several, or I hope to have at least a couple of more Work Group meetings between now and the December meeting, and we'll keep you all updated. Any questions?

CHAIR MELIUS: Thank you, Tim. No

questions?

MEMBER CLAWSON: Yes, I do. Okay, Tim, so when we take and we -- they've re-sampled all of these people, that's going to show us for that one quarter, but, still, I am sure they haven't gone back and re-sampled people for five to six years.

DR. TAULBEE: What it appears from the discussion in the ORPS report is that they indicated that they did not necessarily assess doses, or intakes, based upon the job-specific bioassay, that that was handled under special bioassay which could be a re-sampling feedback loop that we don't know yet.

They certainly did in 1997, that's in the Notice of the Violation, where they went back and re-sampled all of the people in 1997, not just one quarter, all, according to the Notice of Violation.

So we know they did for that particular year. Did they in '95 and '96, I

don't know yet. That's where we have requested the data to see.

CHAIR MELIUS: Henry and then Josie.

MEMBER ANDERSON: Yes, I am just concerned about, you know, half of the monitoring seems to be done for incidents and I was wondering how representative of those are the various trades.

Are some of them more apt to have more incidents that will be weighted towards, you know, a response to some kind of event monitoring versus the routine monitoring and is it randomly distributed through time, most incidents aren't necessarily like that?

DR. TAULBEE: We can certainly look at that. We haven't broken it down to that standpoint, but based upon my review of the job plans individually you've got pretty much an equal likelihood.

If a sheet metal worker is getting into the duct work it could be contaminated and

they could end up getting an incident. Pipefitters may be more inclined to get an incident as well because of cutting into lines.

Electricians though, surprisingly, would get into places that, working on the same jobs with pipefitters that would also result in incidents. So we can look at those.

MEMBER ANDERSON: Yes. Or given the numbers if there was a -- there could be four or five workers exposed at the same incident because they are doing a fairly large job. Do you have any sense on that?

I'm just trying to, again, look at the representativeness, how that compares to routine monitoring. There's quite a bit of -- it's a different approach than incident.

DR. TAULBEE: Right. I don't know that off the top of my head, but we can certainly look at that and report back.

CHAIR MELIUS: I'll just say, you're also talking about one area.

MEMBER ANDERSON: Yes.

DR. TAULBEE: That's correct. What --

CHAIR MELIUS: And so it's going to, I would think that the incident response team, so to speak, or whatever you want to call it, is going to differ depending on the type of incident that might occur.

I think the basic trades will be there, but, you know, same trades, but it would depend and you don't know, Tim, and I mean let's just admit that I mean and then --

DR. TAULBEE: Well you said something which caused me to, because I heard it earlier and I didn't think to respond at the time, is that during the -- you know, we just looked at one area, but DuPont really had a conduct of ops across multiple facilities.

When you get to the Westinghouse era, when they started introducing a lot more subcontractors, I think really some of that uniformity went away.

CHAIR MELIUS: Yes.

DR. TAULBEE: And so, you know, I think even though we just looked at one particular area, I wouldn't expect to see much different elsewhere.

Now when you get into the post-1989, maybe, if you've got a large reactor restart and you've got, you know, hundreds of construction trades workers in one area things might be different.

CHAIR MELIUS: Yes. And I agree we need to treat the areas as, the eras as different, Westinghouse versus DuPont. Josie?

MEMBER BEACH: Okay. So looking at this Westinghouse assessment it seems like that would supersede both NIOSH's and SC&A's samplings which leads us to believe that there is a 79 to 80 percent missing bioassay data for that time period, is that correct, because that's the math I am getting?

DR. TAULBEE: If I may answer that, if

you look at the 1997 assessment that assessment was for 3200 bioassay requests. Ninety-five percent of those 3200 requests were routine monitoring.

Five percent of those bioassay requests were job-specific monitoring. The 21 percent participation rate was just for the job-specific bioassay monitoring, okay.

So 3200 bioassays -- 95 percent of 3200, whatever that number comes out to be, were submitted upon request. They indicated that they had 100 percent compliance amongst the routine monitoring.

And as Dr. Kotelchuck pointed out earlier, DuPont, or Westinghouse in this particular case, could compel their workers to leave the bioassay samples because they would restrict them and they wouldn't be able to do the job and they'd be fired.

So the job-specific ones are more likely to be subcontractors, but many

subcontractors were also on that routine monitoring, okay, they weren't all job-specific, so the 79 percent missing bioassay is just job-specific bioassay.

CHAIR MELIUS: Yeah, I mean, it cuts both ways. Yeah, it cuts both ways, because then how do you say your --

DR. TAULBEE: But of those they went back and re-sampled all of them.

CHAIR MELIUS: Yeah, but you're losing data when you're doing that.

DR. TAULBEE: It depends upon the radionuclide.

CHAIR MELIUS: Yeah.

DR. TAULBEE: If it's plutonium you're not.

CHAIR MELIUS: Well, yeah, but it depends. I mean, the case -- Joe, any comment on that?

MR. FITZGERALD: Well, yeah, I think you were touching on something that we found,

that unlike -- I think you do have this diversity in the site, at Savannah River, and I think this was the genesis of wanting to have an additional broad scope, because the high-level caves I think you are dealing with, you know, again, the longer-lived emitters.

Whereas what we saw, and this doesn't surprise me either, we saw, you know, 75 percent of the RWPs for the early '90s were tritium, mainly because you did have all those subcontractors that were brought in because of the major -- and this I remember it firsthand -- a major, major effort to get K Reactor restarted.

That was the only source of tritium production in the country. So a lot of resources were being pumped, and more than Westinghouse had, so they brought in as many, you know, as much support from the outside.

And these workers, because they are operating in slightly contaminated environments were all, you know, tagged to RWPs that required

-- and standing RWPs and all these varieties for which tritium bioassay was required. And you do have an issue if you have a delay, too prolonged of a delay in the bioassay for tritium. So that's certainly one issue that stands.

The other issue, and I know we've had this discussion offline already, is that, you know, the re-sampling I can understand. Westinghouse had to demonstrate to DOE that, despite the fact you had the 79 percent weren't bioassayed, that as it turns out there was no positive intakes.

I mean, if there were positive intakes I think it would have ratcheted up, you know, the violation and the concern incredibly, you know, significantly, but it doesn't answer, in my view, and still doesn't, the question of what about the time periods before?

I can understand why they'd do a re-sampling on the heels of an NOV, but did they do enough re-sampling to, frankly, mitigate the lack

of bioassays in the earlier time periods? So that's kind of my offering.

CHAIR MELIUS: Before we go any further -- I don't see any hands up, so to speak, from the Board Members. We need to hear from the petitioners. Are the petitioners on the line?

MR. JOHNSON: Yes, sir, we're here.

CHAIR MELIUS: Okay. You are welcome to make comments.

MR. JOHNSON: This is Warren Johnson. Quite frankly, this feels like, well, essentially Groundhog Day. We were here roughly this time last year hearing roughly the same thing, which is we're talking about different statistics and whatnot, but the end result was -- just look at the big picture.

We've been doing this for over ten years. NIOSH has been creating dose reconstructions for over ten years that were wrong. They admit they were wrong. They were using the wrong model. This Class of worker has

been told their dose reconstruction -- they weren't entitled benefits based on a dose reconstruction that was admittedly flawed, and now we're being told yet again "we think we can get it right, we'll let you know in November."

You know, one of the problems with this analysis is feasibility. And, you know, obviously, the second is sufficient accuracy. It hasn't been feasible to get this right for over a decade and we are still -- what I hear is a lot of statistics that result in a guess.

The numbers, as I understand it, is -- that we just were told is 67 percent is enough, that's sufficiently accurate. Well, if you look at that, that's based on 59 of the 88 people, or of a sample of 88 workers who were assigned respirators.

You make a lot of assumptions to get there, that that's representative. One, you're assuming that everybody was properly assigned respiratory protection when they were supposed to

be.

Two, you then break down that 59, 33 percent of the 88 is when -- they are being counted because they were involved in an incident and were sampled. Well, that's not sufficient. The other 34 percent of the 88 were based on routine monitoring. Well, we don't know, one, on the incidents, what were they being sampled for? The example was a person that was involved in an incident and had negative plutonium uptake and a positive americium. Well, what all was present? What all should they have been tested for?

On the routine monitoring, when did that take place, what was the basis, and what were they looking for? Were they looking for the correct thing?

If you're not looking for the correct radionuclide you're not going to find it. We're essentially ignoring all of the data collected from the worker outreach programs and the testimony of the various workers who often refer

to the fact that there was no HP coverage when they needed it.

Well, that data is not there, you're overlooking that. And NIOSH referenced that the 67 percent is good enough if there's no bias. Well, you know, that's a very, very small sample of a great deal of potential workers. How many of those are we excluding that had high uptakes?

The second part of that is we're focusing on one small -- a very small part of the site.

Another thing is, if we look at the history of this, we've been told numerous times about, you know, what the procedures say or what was reported, what's the highest intake reported.

I'll point you back to 2005, SC&A's report, it was TR-TASK1-0003 where they note it was reported there was 99 uranium uptakes, in the history of the site, in 2000. But SC&A found 155 positive bioassays for uranium over a 6-year period. So how reliable are these records? We

know they are incomplete. There's reference to the destruction of records.

You know, if there were not incidents -- if incidents were not reported or discovered, there isn't going to be a bioassay for it. What we are going to, 79 percentile, or 79 percent non-participation rate on the bioassays, among other things that demonstrates to me is there was not adherence to the procedures that they were supposed to do.

Just because they had a rule doesn't mean followed it. And, in fact, history has shown many, many times it wasn't followed. I don't think you can give the benefit of the doubt to the site.

I think, among other things, that's certainly not claimant-favorable. It's certainly not sufficiently accurate. It essentially amounts to a guess.

I've heard a number of times from the NIOSH --

(Simultaneous speaking)

MR. KATZ: Excuse me. Excuse me, Mr. Warren, just one second. Hello, hello? There is some people having a conversation about a coffee shop on this line. You should have your phone muted or hang up, either way, but you are interfering with Mr. Warren trying to give his comments to the Board. So, please, either hang up or put your phone on mute. You press *6 and that will mute your phone and then rest of us will be spared of your conversation. Thank you.

MR. JOHNSON: Thank you.

MR. KATZ: Sorry, Mr. Warren, go ahead.

MR. JOHNSON: No problem. I was referring to a number of things. I've heard comments from the NIOSH representative that he wouldn't expect to see this or he would expect to see that.

I believe that's speculative. That's making an assumption, what he expects to see. I

think, at this point, we deserve to deal with the evidence that's before us, and the evidence is that there is a sparsity of records, there is widespread noncompliance.

The Tiger Team even noted that there was a lack of HP coverage, there was a lack of HP coverage with trained technicians, properly trained. Some of the citations are safety violations, and the Tiger Team report notes that they were using a pancake probe at too high a speed to actually detect anything.

You know, there's too many flaws, too many guesses, to begin to say that this is being done with sufficient accuracy.

As to feasibility, you know, we're over a decade now, and how many times can NIOSH get it wrong, how many times do these claimants have to sit and wait and suffer?

At this point, I think it's been proven that the dose reconstruction cannot be performed. One, it's not feasible. You can't

ignore time. When it comes to feasibility you also can't ignore resources. How much money and time has been spent on this?

And then, second, they can't get to sufficient accuracy. We're talking about -- when I look at -- and you can do a lot of things with numbers and statistics, but when I look at it, what I understand from the sample was 59 of 133 people sampled were actually monitored.

Well, that's 44 percent as I do it. Yes, you can then try and whittle that down, but, one, is that representative sample at 133 of the workers? And, two, you selected that sample, only 59 of that sample actually submitted bioassay.

I believe that leaves us with the coworker model that is proposed being essentially a guess, and that's not good enough. Sixty-seven percent is still a guess, but I believe it's less than that. It just depends on how you want to re-shake the numbers and what story you want to

tell. But if we looks at the facts objectively, that's where we are.

This is too speculative to rely on. And at this point, after all this time, I believe it's appropriate for the SEC to be granted.

CHAIR MELIUS: Okay, thank you.

MR. JOHNSON: Thank you, all.

CHAIR MELIUS: Turning back to the Board, Brad, you had a comment?

MEMBER CLAWSON: I'm just wondering if we even have a quorum.

CHAIR MELIUS: It depends on who's on the phone.

MR. KATZ: Paul and Gen and Bill, do we have any of you on the phone?

MEMBER ZIEMER: This is Ziemer, I'm on the phone.

MR. KATZ: That's Paul.

MEMBER ZIEMER: Were you asking if I had a comment or what?

MR. KATZ: I'm sorry, I couldn't

understand what you were saying, Paul.

MEMBER ZIEMER: Oh, you just asked if I was on the phone --

MR. KATZ: Right, right. Yes, I heard the yes. I thought you said something else after that. So that's not sufficient. Do we -- Gen, are you on the line?

(No audible response)

MR. KATZ: And Bill?

(No audible response)

MR. KATZ: We do not have a quorum.

(Simultaneous speaking)

MR. KATZ: Bill?

(No audible response)

CHAIR MELIUS: No. So we don't have a quorum, so we need to suspend and we will take this issue up again at the Board work call, presuming we have a quorum.

MR. KATZ: Right. That's the Board teleconference. I think it's in October.

(Simultaneous speaking.)

MR. KATZ: I'm sorry, I couldn't understand if someone on the phone was trying to say something to us.

MEMBER ZIEMER: Do we have a quorum, is that what you are asking?

MR. KATZ: Oh, Paul, we do not have a quorum, so we are going to suspend, or adjourn.

CHAIR MELIUS: Adjourn and we'll take up this as part of our next Board work call, Board work call meeting, or whatever we call it.

MR. KATZ: Board teleconference.

MEMBER BEACH: So I'm going to be -- I'm going to miss that, and so will the Chair, so just to point that out, in October.

(Pause.)

Adjourn

CHAIR MELIUS: We are adjourned.

MR. KATZ: Thank you. And thank you everyone on the line. Again, we are adjourned.

(Whereupon, the above-entitled matter went off the record at 3:16 p.m.)