U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
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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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DOSE RECONSTRUCTION SUBCOMMITTEE

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THURSDAY
SEPTEMBER 28, 2017

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The Subcommittee convened via teleconference at 10:30 a.m. Eastern Time, David Kotelchuck, Chair, presiding.

PRESENT:

DAVID KOTELCHUCK, Chair
JOSIE BEACH, Member
BRADLEY P. CLAWSON, Member
WANDA I. MUNN, Member
JOHN W. POSTON, Member

ALSO PRESENT:

TED KATZ, Designated Federal Official
DAVE ALLEN, DCAS
BOB ANIGSTEIN, SC&A
BOB BARTON, SC&A
KATHY BEHLING, SC&A
CATHY BOOTH, ORAU Team
GRADY CALHOUN, DCAS
ROSE GOGLIOTTI, SC&A
JENNY LIN, HHS
JOHN MAURO, SC&A
BETH ROLFES, DCAS
MUTTY SHARFI, ORAU Team
SCOTT SIEBERT, ORAU Team
DAN SMITH, ORAU Team
MATT SMITH, ORAU Team
JOHN STIVER, SC&A
DENNIS STRENGE, ORAU Team

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

10:39 a.m.

Welcome and Roll Call

MR. KATZ: Welcome, everyone. This is the Advisory Board on Radiation Worker Health. This is the Subcommittee on Dose Reconstruction Review teleconference.

We have an agenda today and that's posted on the NIOSH website under the program, the Board schedule of meetings, today's date, and you can see the agenda if you need to although it's very simple and probably not that useful to you.

And there's one document that's also posted for this meeting. It is a review of what's called PER, P-E-R, Program Evaluation Report 61 which deals with the site Bridgeport Brass.

So if you're interested in that, that is posted on the NIOSH website. The rest of the materials are full of private information so they're not shared on the website.

So moving on from there, roll call. What I'm going to do is address conflicts of

interest for the Board members. That way they don't need to do that as we take roll.

(Roll Call)

MR. KATZ: Okay, we have a lot of people on the line so please everyone remember to mute your phone.

And for those of you that aren't familiar if you don't have a mute button press * and then 6. That'll mute your phone for this line. And then press * and 6 to come off of mute.

And please no one put this call on hold at any point because that causes problems for everyone.

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

CHAIR KOTELCHUCK: Okay. Hello folks. Good we got started. Sorry we're a bit late.

And the first item on the agenda is the review of the Program Evaluation Report 61 from Bridgeport Brass.

And who will lead off on that for the discussion?

DR. MAURO: Dr. Kotelchuck, this is

John Mauro. I was the lead on that. I'd be glad to take it from here.

CHAIR KOTELCHUCK: Great. Thank you.

Review of PER 61 (Bridgeport Brass)

DR. MAURO: Okay. Good morning, everyone.

You may be wondering why we're doing Bridgeport Brass as part of the DR Subcommittee, PER, and there's a little history here. I'll make it brief.

Mark Griffon many, many years ago when he was running the DR Work Group, one of the things that was going on at the time is I was very much involved in doing dose reconstructions for AWE facilities.

And one of the first AWE facilities I reviewed was -- of cases was Bridgeport Brass.

And during one of our issues resolution meetings Mark said you know, we really haven't done any reviews of the Site Profiles. You know, we're doing cases, but we really haven't --- and the reason was by and large a case review --- since there was in those days

there was very little data for a particular case at a particular site.

So in effect the case review actually was -- had to be also a Site Profile review.

But Mark indicated that you know, why don't you do a focused review as an attachment to a DR review.

So in a funny way what happened was we ended up doing a Site Profile review in conjunction with a DR review. So it connected up.

And I believe that's the reason why we're doing this PER. Because normally my experience is Wanda runs it under Procedures, these PERs, but this one looks like an exception.

Wanda, do I have that story correct? Is that your recollection also?

MEMBER MUNN: Pretty much. It was so early in the game. We just simply did not have the reams of data that we now have.

And I think it bothered Mark a little bit. But yes, I cannot -- but thank you for reviewing that because when I saw this on our

list I was wondering myself.

I was trying to --- and frankly I had not remembered until you refreshed what remains of my memory. I think that that's it.

DR. MAURO: Okay. Well, we'll continue now. So this PER review --

CHAIR KOTELCHUCK: By the way for me, Dave Kotelchuck, this is the first PER we've reviewed since I've been on the Subcommittee.

MEMBER MUNN: Yes, I believe it is. But we have such fun with it in Procedures we just try to keep all the fun away from you.

MR. KATZ: Just for context, the PERs get reviewed whenever there's a Work Group that deals with the site the PER goes to that Work Group and not to Procedures.

And in this case dose reconstruction, as John just said, served as the Work Group for the Site Profile review. But anyway, carry on, John.

DR. MAURO: Okay, very good.

MEMBER MUNN: An unusual history.

DR. MAURO: Yes. Bridgeport Brass

actually is two facilities. The Adrian Lab in Adrian, Michigan and the Havens Plant in Bridgeport, Connecticut.

They actually began under contract in the Atomic Energy Commission around 1950-52 time frame.

And their primary mission was to do some machining work on uranium and thorium. There was about -- when you look at the records there was about, oh, the throughput of uranium was not -- relative to thorium, the thorium was maybe 5 percent of the throughput of uranium. And you want to keep that in mind because that's useful later when we talk about how they do the doses from thorium. Because thorium is not actually monitored while uranium was extensively monitored for the workers.

The facilities themselves did similar work, both Havens and Adrian Plant. And where they worked with uranium metal and uranium oxide.

Did not do any conversions, so there was no conversions, it was just metal uranium handling operations.

And it was natural uranium, 2 percent enriched uranium. And I raise that because that brings in issues related to possible neutronic exposures from spontaneous fission that we'll talk about.

They also worked with thorium. And in addition they had recycled uranium. So that sort of sets the table for the types of external/internal exposures that the Site Profile had to deal with.

The Havens Laboratory actually began work in 1952 while the Adrian Plant started in 1954, the AWE activities.

Both ended their AWE activities in 1962 when there was a D&D and survey. So that's going to be very helpful to us later when we talk about the residual period and how that's dealt with.

The types of operations was extrusion and lathe operations of the uranium and the thorium.

The Adrian Plant had a couple of other things going for it that we'll talk about a little

bit.

One it had a cobalt-60 source, and two, it did X-ray crystallography. And we'll talk a little bit about that also.

Now, historically the way this all worked out was SC&A did originally review as part of its focused review I mentioned earlier Rev 0 of the TBD-0030 of the Site Profile.

But over the years it went through a number of revisions and in 2013 Revision 2 of the TBD was issued and that's what triggered the PER. So in effect what we're going to do here is we're going to -- and we never reviewed. We have zero. We never actually formally reviewed the Rev 2. So that means that this PER review is a combination PER review and Site Profile review for Rev 2. So that sort of sets the table for my comments.

I'm going to start with the internal dose and what was done originally in Rev 0, what some of our concerns were at that time, and the degree to which those concerns have been resolved in the latest Rev 2.

It turns out for internal dose there's lots of bioassay data. So this is one of those unusual AWE sites where we don't have to rely on TBD-6000, but we can actually take advantage of the large amount of bioassay data which consisted of urine samples where milligrams per liter measurements were made.

So therefore there was a need to convert that to picocuries per liter or picocuries per day intake.

Now, the way in which NIOSH did that originally was it said well, we know they handled some 2 percent enriched uranium so we're going to be claimant-favorable and treat the milligrams per liter as if it was enriched uranium which basically increases the intake and the dose associated with the intake of uranium by -- well, the difference in the specific activity is the 2 percent enriched is 1,616 picocuries per milligram, while natural uranium is 683 picocuries per milligram.

So as a result NIOSH was claimant-favorable in assuming it was all 2 percent

enriched which basically increases the intake and associated doses by about a factor of 2.5, a ratio of 1,600 to 683.

And what they did -- now they had all this data on bioassay and they pooled the data. And what they did was they built a coworker model to reconstruct the doses where they used the upper 95th percentile of the data as the coworker.

So they made two very conservative assumptions. One is that all the intake was 2 percent enriched. And out of that they used the upper 95th percentile of the pooled data that was collected.

Now all of which is extremely claimant-favorable.

The one concern at the time we did our Rev 0 review was that most of the data that was bioassay data was really post 1960, 1960, in that time frame.

And much lesser amounts in the earlier years in the nineteen fifties.

But we discussed all that and it was

agreed that very fact that NIOSH employed the 2 percent enriched uranium and used the 95th percentile I think more than accounts for any possible concerns that the data set was heavily oriented more to the later years of AWE operation.

So that issue was resolved. And so therefore from an internal exposure point of view for uranium the approach taken is -- SC&A concluded everything is fine.

So from a review of the Site Profile we believe that this approach is fine.

Now, the other issue that was on the table is RU, recycled uranium. In the original Rev 0 there wasn't -- recycled uranium was not explicitly considered. But in the latest revision it is and they use the default values for recycled uranium that are in TBD-6000 which has been reviewed and approved and accepted.

So therefore that issue has been resolved in the latest TBD.

And finally, the question of thorium comes up. You know, how do you deal with thorium

if you don't have any bioassay data.

Well, what was done in Rev 2 and also in the original one was to say well we know the throughput in terms of mass, kilograms per year, or tons per year, or whatever going through the facilities, both facilities.

And it turns out -- we went into the data and looked at it. And it turns out the mass throughput, 5 percent was thorium.

So what NIOSH did is say okay, we're going to assume the intake of thorium, because they were doing basically the same kinds of things, machining, handling the thorium as they did with the uranium, except the amount was much less.

So the assumption was made that the intake of thorium was 10 percent of -- in terms of activity now, it was converted to activity, was -- well, the mass intake was 10 percent of the uranium intake as opposed to 5 percent. So there was a built in factor of 2 there because the actual number was 5 percent but they assumed 10 percent.

And of course they needed to convert it to picocuries as opposed to mass which they did and they did it in a way that was claimant-favorable. That is, the conversion, you could have either assumed a slightly enriched uranium or unenriched uranium.

It turns out when you make that conversion -- it's a little bit of a brain teaser, but it turns out that assuming that the uranium is natural uranium it ends up with higher thorium intakes, and we went through that and convinced ourselves that that was reasonable.

So the bottom line with regard to internal dose is our review of Rev 2, everything from internal dose reconstruction, all bases are covered and we find it's scientifically sound and claimant-favorable.

I could stop at this point before we move on to external dose, but maybe I could give you folks a chance to -- any comments or thoughts regarding that little summary.

I'd like to hear whether NIOSH agrees that I correctly characterized it and whether or

not there are any questions.

CHAIR KOTELCHUCK: Okay, first NIOSH folks is that -- did he properly characterize it?

MR. ALLEN: Yes, this is Dave Allen. I believe it has been.

CHAIR KOTELCHUCK: Okay. And are there any comments, and in particular the decision -- I'm trying to see where you said this is the 2 percent enriched plus the 95th percentile of the data was a judgment and appropriate for the committee to discuss.

Does anybody have comments about whether that -- does anybody on the Subcommittee have comments on that? They certainly left it open for us to discuss and I guess that's on page 12. I have none.

MEMBER MUNN: This is Wanda. I have always thought that the assumptions that were made and the calculations that were made are extremely claimant-favorable.

And I have seen no reason in this report to change my personal position on that.

CHAIR KOTELCHUCK: Okay.

MEMBER MUNN: It's certainly been well thought through.

CHAIR KOTELCHUCK: Yes. Any further comments? Josie?

MEMBER BEACH: Go ahead, Brad.

MEMBER CLAWSON: No, I was just going to say I didn't have any problems with it.

MEMBER BEACH: Yes, and I didn't either. I thought they did a good job with it.

MEMBER POSTON: This is John. I'm okay with it.

CHAIR KOTELCHUCK: Good. And I also am. So we're really in agreement with that approach and that's important.

So any other comments about what we've done so far? So, we should continue then.

DR. MAURO: Very good. I will move onto the external dose protocol.

In our original review --- in the original TBD Rev 0 we reviewed that and I'll give you a little rundown of what we found and where some of our concerns were. And then we'll talk a little bit about Rev 2, the latest revision and

how those concerns have been resolved and the degree to which they were resolved though maybe there may still be some concerns.

What was done is there was lots of external dosimetry film badge data for both beta and gamma.

And the turnaround was a two-week period so they have all this two-week film badge data for many workers.

And they pooled the data and they plucked off the upper 95th percentile doses, annual doses associated with the pooled data.

I have to say I'm not quite sure now that we're talking about it whether what was done is you take these hundreds or maybe more two measurements expressed in millirem, open window and closed window, and you have individual numbers, maybe even hundreds of them.

The way I understood it is you ranked-order those and you take the upper 95th percentile value in millirem per two weeks and use that as the annual dose.

That was my understanding at the time

of the review. And I just put that on the table as food for thought. If that was done that's certainly way up there in terms of being conservative. Or some other method used that may have been closer, still conservative but perhaps a little bit more realistic.

Think of it like this. You've got all these two-week readings, right. And you list them in order. You take the upper 95th percentile which is going to be a big number, and then you assume that everybody got that dose not only for 2 weeks but all 50 weeks in the work year.

So I'm not sure the degree of conservatism, and I have to say I didn't go back and do enough homework in preparing for this meeting to go check exactly how the mechanics worked on that.

If Dave or folks there at NIOSH have some information. Or maybe not. We'll hear a little bit more about that.

But either way the fundamental approach was lots of data and claimant-favorable. And the fact that they went with the 95th

percentile sort of captures any limitations that might have been in the data where there was a degree of certainty that you certainly are being bounding.

One of the issues though that's sort of related to this question has to do with what's called correlation and non-correlation.

At the time we reviewed this, think of it like this. The reality is, the way you really should look at it is people. And one worker may have had a 26 two-week film badge change-outs. And you add them all up for that worker and you get an annual dose.

And then you get another worker, and another worker, and another worker.

In my mind the way to look at it is really the data, each two-week measurement is not independent of every other two-week measurement but they're correlated.

You have one worker who as an individual worked in a higher level exposure area and therefore he over the course of the year would have successively higher doses than let's say

some other workers.

And so what we did is we said well -- and [identifying information redacted] did this, it goes way back. And he looked at the question of correlated versus uncorrelated.

Now in the writeup in Rev 0 it was stated that no, they did it correctly, they correlated the data. So we checked that. We said okay, let's see.

Well, when we did it ourselves using the original data we -- the results that came out at the time was it looked like they didn't correlate it, and as a result the 95th percentile dose that had been assigned to all the workers might be low by a factor of 2.

And that was a comment we had. This applied to their protocol for doing the exposures. And that was like one issue that we raised at the time.

And the other issue we raised at the time had to do with data exposures. And John Poston may remember this. This goes way back to maybe 2005 and I was up there one of the first

times before the Board and I raised this issue and John mentioned -- I said listen, we're a little nervous about the beta dose. You're reading a film badge and the beta dose could very well be localized and the person could receive an exposure sort of anywhere on his body, skin dose.

And the film badge that you're reading may be indicative certainly of where the film badge is sitting, but is it really indicative of the rest of the body.

So that was an issue that we raised and we discussed, and I remember John weighing in on this during that meeting. Goes way back.

Anyway, that was our review of Rev 0 and some of the things that we expressed concern with.

Subsequently Rev 2 was issued and there was a substantial revision of the way in which these doses were derived.

And it turns out the outcome was the exposures were now approximately exactly the values that we came up with originally when we did our review very close to -- in a factor of 2

that I mentioned earlier where we felt there might be a problem there. Well, that factor of 2 went away and the numbers were right on.

So our takeaway is that the current method in Rev 2 is scientifically sound and claimant-favorable.

But we did have one observation related to this and that is there was -- as part of this external dose that was being derived from photons I believe NIOSH defaulted to 30 to 250 keV.

And in looking over the exposure data and where it's coming from, the radiation field coming off let's say uranium metal, the field -- - the flux of photons is hardened because it's coming through this dense uranium metal and it hardens the spectrum. What comes out is different than what actually is emitted by each individual uranium atom.

And so one of the things we came away with is that well, it's possible that a substantial portion of the spectrum was above 250 keV. And this was one of our observations that

we certainly could talk about a little bit right now.

DR. ANIGSTEIN: John, this is Bob. I'd like to make a clarification.

There were two different quantities involved. One is the photon fluence, number of photons per square centimeter, and the other is total energy deposited.

So NIOSH made the observation, made the assumption that most of the photons by number are in the 30 to 250 keV range.

But if you look at the photon energy most of the photon energy is the above 250 keV.

So since it's a dose that's being converted to organ dose, it's more claimant-favorable to assume over 250 than 30 to 250 for most organs.

There are a few exceptions where the other conversion will be more claimant-favorable.

DR. MAURO: Bob, thank you so much for helping me out there.

So that was an observation as part of our PER review. And that was on the table as

whether or not that's something that needs to be dealt with or not. So we could put that on.

We could talk about that now or I could finish up my external discussion. I don't know if NIOSH has any thoughts regarding that concern.

MR. ALLEN: This is Dave Allen. Yes, I'd like to respond to that if I could right now.

DR. MAURO: Sure.

MR. ALLEN: The idea that the 30 to 250 keV photons are favorable doesn't have much to do with the dose conversion factor, it has to do with the radiation effectiveness factor in IREP.

The radiation effectiveness factor which is our distribution that replaces the quality factor is exactly one for greater than 250 keV photons meaning there is no real distribution, it's just multiplied by one.

The 30 to 250 has a distribution that ranges -- the 95th percent confidence interval ranges from 1.1 to 4.7. The median is 2.4. So the median is actually 2.4 times -- the

Probability of Causation will end up being 2.4 times higher dose per dose if you assign it to that middle category.

So in the end if you have picked a same dose or same exposure you assign the DCF to it and then put it in the IREP as these two different things the 30 to 250 will be favorable.

DR. MAURO: You know what, I didn't know that. And so you're effectively saying notwithstanding the dose conversion factor question that Bob just pointed out, you're saying that's more than accounted for by the IREP conversion where it goes to risk or Probability of Causation.

MR. ALLEN: Right. It'll be at least 2.4 times higher PoC.

DR. MAURO: I have to say I don't recall us -- have we talked about that before? I'd like to think that I remember all these things, but is this something that has come up before or is this the first time we're talking about this?

MR. ALLEN: It seems like it has but

I couldn't swear to it.

DR. MAURO: Yes, okay. Well, I mean, I certainly accept that argument. In other words I didn't think of it and I wasn't aware of it, but I understand what you're saying.

Bob, what do you --

DR. ANIGSTEIN: No, no, I'm not in a position to check it right this moment obviously but assuming, accepting what Dave is saying that's certainly acceptable.

We only talked about DRF with regard to neutron exposures once in connection with GSI. But yes, that's a very -- I accept that explanation.

DR. MAURO: Thank you. Very helpful. I don't know if the Board wants to weigh in at all on that?

CHAIR KOTELCHUCK: Well, let's see. Board folks?

MEMBER MUNN: Nope.

CHAIR KOTELCHUCK: Make sense folks?

MEMBER BEACH: Makes sense to me.

MEMBER CLAWSON: This is Brad. It's

been such a riveting conversation, I -- as long as we feel good about it that's fine.

CHAIR KOTELCHUCK: Okay. That would involve a slight revision of the PER, right? I mean, it makes sense what you're saying. And so that observation or this discussion needs to be embodied in the text form in these pages.

MR. KATZ: Well, Dave, what they're saying is the PER is fine as is.

What they're saying is the PER is fine as is.

CHAIR KOTELCHUCK: Right, but something has to embody the discussion that we just had.

MR. KATZ: I think the transcript will embody that. But I mean ---

CHAIR KOTELCHUCK: That's true, that's true. We do have a written transcript.

MR. KATZ: The Board reviews --- so observations, gets responses to them, and the response will be put in with the observation, and then everybody's fine with it, we'll indicate it in the Board Review System.

CHAIR KOTELCHUCK: Okay, so that's how we handle it administratively. All right, I just want to make sure that it's -- okay. Good, good.

MS. BEHLING: This is Kathy Behling. I could also add that we will introduce this into the BRS and we will -- at least I planned on incorporating this observation and also add a comment as to why this observation is not appropriate because of Dave Allen's explanation. So that will be incorporated into the BRS.

CHAIR KOTELCHUCK: Excellent. Excellent. Okay. Good, good. So we're in agreement and we have --- administratively it's handled properly.

Good, so I think we can go on.

DR. MAURO: Okay, I'll pick it up. The next external dose issue point, it has to do with X-ray crystallography. This was going on at the Havens Lab.

And interestingly enough this was a topic of considerable discussion with Bob Anigstein on Carborundum relatively recently.

And the only commentary we have here

is in the Rev 2 of the TBD that's the basis for the PER I believe that the assumption was made that X-ray crystallography delivered -- you may want to help me out a little bit on this, Dave -- an assigned dose.

The estimate is that we're talking about doses that are less than 2 millirem -- I'm sorry, 10 millirem per every two-week period would be the kinds of doses that would be experienced and that in theory all that's covered because there was the external dosimetry TLDs or film badges.

And we have data, and they were from the upper 95th percentile. So in theory the actual measurements accounted for that.

Now, the only thing I could bring up that might still be something that's worth discussing is a matter that Bob Anigstein brought up on Carborundum regarding X-ray crystallography and the nature of its localized dose.

That is, the film badge readings certainly would be indicative of exposures. Perhaps we'd say generally to the whole body.

But it may not be indicative of some localized doses that might be associated uniquely with X-ray crystallography.

Bob, did I -- is that a fair characterization of the special challenges associated with reconstructing X-ray crystallography dose?

DR. ANIGSTEIN: Well, the problem is it's very difficult to do because unless you have local data like for Carborundum we happened to find --- I happened to uncover a worker who had actually done the X-ray crystallography. We interviewed him and then ORAU Team interviewed him. And we got a lot of detailed information for that particular apparatus, for that particular setup.

So we were able to -- and NIOSH came up with a methodology of assigning doses which has been accepted with some modification. Modified exposure time and also modified the energy.

However, here there's no information. And so each site is different. And it's

generally, particularly in those days it was generally recognized as a hazard.

What was then the Bureau of Electronic Products I believe, handled X-rays in the sixties. And they had a conference in Philadelphia, a day-long symposium addressing the hazards.

And it was generally recognized that the equipment was --- had potential hazards. The safety devices had not yet -- the ones that were just being built had interlock and safety devices, but the earlier ones didn't.

And there were cases of severe burns and I think maybe even finger amputations as a result of those exposures.

So we don't really have an answer of how to handle it.

DR. MAURO: You know, I only bring it up because we did look at it at Carborundum. As Bob just summarized it was an interesting and unique circumstance.

And I think I just wanted to bring it up to the attention of the Work Group and NIOSH

that this work has been done on Carborundum.

The degree to which it needs to be addressed explicitly as a special circumstance here at Bridgeport Brass I'm not sure. But I just wanted to alert everyone to that issue. I think we could leave it at that.

CHAIR KOTELCHUCK: Could I ask -- it's Dave. Is there any way that we can identify the workers or the department where this was done and exclude the other persons?

I mean, it was presumably done by a small number of people, the X-ray crystallography. It was I believe in the early years at that time of work.

MR. ALLEN: Were you asking me? This is Dave Allen.

CHAIR KOTELCHUCK: I'm not quite sure who I'm asking, so anybody who responds is most welcome.

MR. ALLEN: Well, this is Dave and I'd just have to apologize. I didn't look very closely at this issue. Somehow I essentially missed this issue when I was reading through the

report as a matter of fact. So I don't really have any kind of response right now for this.

CHAIR KOTELCHUCK: Yes. When I read through this and reviewed it it did seem to me that that was essentially an observation even though it was just written in the text as another line of text.

But they should attempt to identify -- - NIOSH should attempt to identify former workers which admittedly is going to be very difficult. We're talking about something that happened so many years ago.

Whether those workers are alive, or identifiable.

I'm not quite sure what to do with it either.

DR. ANIGSTEIN: If I could -- this is Bob Anigstein. I mean, I can think of several circumstances. I don't know if it's my place to make a suggestion, part of the Work Group.

One is if the case is for -- first of all, it's only significant to skin cancers. Skin dose is about the only thing you get very much

of.

So if there is a skin cancer, and if the site of the cancer makes it plausible that he could have been exposed to an XRD on the hands, on the front of the body.

And then finally, if the worker is still alive and can be -- is in a position to be interviewed then he could certainly be asked.

But if the worker is deceased and we're talking to survivors they may not know 30, 40 years ago what did my father do, what did my grandfather do. I know he worked in that place but it would be very difficult to say.

So there may -- NIOSH could take a position that in plausible cases where it could have been due to X-ray exposure to the skin to grant -- there may not be very many, to grant those cases. This is just sort of an idea.

CHAIR KOTELCHUCK: Yes. Well, the fact that you would say that from the X-ray crystallography it would really only be skin cancers that we would be dealing with.

DR. MAURO: And probably extremities.

Hands also I believe.

CHAIR KOTELCHUCK: Yes.

DR. MAURO: It's a very focused issue.

CHAIR KOTELCHUCK: Right.

DR. MAURO: And of course then on that basis I know, Bob, is there a way to say okay, when reconstructing the doses to the hands on a person who may have had skin cancer on their forearms or their hands that you could assign some X-ray crystallography dose? Or is that --

DR. ANIGSTEIN: Well, if there happened to be a shuttle left open by mistake he could be getting a direct beam. I can't come up with a number but it would be significant.

I mean, it has been enough to cause non-stochastic effect, deterministic effects. It has been enough to cause severe burns.

We're talking about -- John Mauro would probably have a better sense of it than I do, we're talking in the hundreds of rads.

DR. MAURO: Sure. And that would be probably something that would go into a medical record.

So I think we're chipping away at this thing a little bit and we're making progress.

DR. ANIGSTEIN: I'm saying if it's that bad. But others could have smaller doses that don't have any visible symptoms, any deterministic symptoms, and yet have a cancer causation.

So the doses could be anything from, I'll just pick a number, anything from zero to 100 rads.

CHAIR KOTELCHUCK: Dave, I'm concerned that this is a very difficult assignment to task NIOSH to do.

MEMBER BEACH: This is Josie.

CHAIR KOTELCHUCK: Sure.

MEMBER BEACH: Wouldn't it be as simple as just pulling skin cancers and seeing what was there and going from there?

CHAIR KOTELCHUCK: Well, I would think that -- and skin cancers on the extremities if we can identify that would give us perhaps the population that might have been affected by this. I'm not sure what we could do afterward.

I would certainly be interested in folks checking on that. That could be done fairly easily, right, folks? NIOSH folks?

MR. ALLEN: This is Dave Allen. Yes, I think I can come up with that, but I'm not sure what that's going to do for us.

CHAIR KOTELCHUCK: Right, I agree.

MR. ALLEN: Even if there is no cases but that doesn't mean it'll never be.

CHAIR KOTELCHUCK: That's true. Well, if they're not doing the crystallography anymore. That's all finished, right?

So if people were going to get cancer, I mean whatever the period is that it would take for the cancer to develop that's long gone.

DR. MAURO: Yes, the period of AWE operations ended in '62.

CHAIR KOTELCHUCK: Right. It would be interesting to find out but I would agree with you that I don't see what we could then do with it other than to say it could not affect -- or this would be the population that might be affected.

But going forward to new folks coming in there should be, well, we can certainly take a look at people who are filing claims and see whether the claims cover a period before '62. I mean there may be some older employees who will do something.

But then again I don't know how to do it. It just defines for me the upper limits of how far -- what group could be affected. And hopefully that would be a small group.

Nevertheless could we handle claims from that group. And I don't see how.

Other folks, anybody have further thoughts? I mean, we are understanding a little bit more about what we could do to move in, but I'm not sure if we could end up with a scientifically based dose reconstruction for this concern.

MR. CALHOUN: This is Grady and I kind of agree with you, Dave. I don't know what the end game here is with this.

It's a really big what if something might have sort of happened. I don't know. I

mean, we can take a look but unless something drastic comes up I don't know what we get from even coming up with a group of people that may have been involved with this.

I don't quite understand what the goal is.

CHAIR KOTELCHUCK: Well, it would be -- however, we could get the population of -- that were exposed among people who have already been claimants.

It is possible that that group will be zero. I think there's a possibility.

MR. CALHOUN: But then what do we do?

CHAIR KOTELCHUCK: Going forward we don't -- I don't see any way to handle this.

MR. CALHOUN: Exactly.

CHAIR KOTELCHUCK: But on the other hand I would be -- frankly, it's a fair -- not frankly, I'm not telling you, but I think it's a fairly small task to find out about skin cancers that occurred on the extremities.

And it would make me more secure to know that it can't be very large.

But I'm not able to see how we can deal with it. Again, let me open up the discussion and other -- either to Subcommittee members or staff persons on the phone.

MEMBER MUNN: This is Wanda. This question has been discussed as you might guess, on more than one occasion.

And the comment that was made earlier seems to be rock solid to me. That is to say if there had been any kind of off-normal incidents where there was one or more individuals who might have been exposed, over exposed to any significant extent it would be most assuredly in their record, if not their work record certainly their medical record.

Even -- let's not assume that everyone who was working in 1950 was an idiot, we did know a little bit about the effects of X-rays of all types. Crystallography was such a tiny, tiny subset. And the number of people who even knew how to operate the machinery was such a tiny, tiny subset of the individuals who had been involved and the area where they were working

would have been quite small.

And certainly we certainly knew, a great deal was known about the effects of over exposure.

So, yes, I can't help but believe if there had been any significant amount of over exposure to any individual or any group of individuals there would be some record that would have been obvious given the amount of dose records and the amount of scrutiny that this particular groups received.

I'm comfortable with the scrutiny it has received which has been significant and I don't feel that there's any reason to pursue it further personally.

CHAIR KOTELCHUCK: Okay.

MEMBER CLAWSON: Dave, this is Brad. I like hearing this because this all comes back to one thing. How good is the data, how good are the records that we actually get. Because there could have been a lot of records in there, there could have been exposures put in there, but there could be blanks throughout there.

It's what we have found in every site that we have visited. I don't think that we can just cast off that way. Myself, I still believe that -- I agree wholeheartedly that this is a small group, but we're also tasked that we evaluate this as best that we can.

If there's nothing like Grady said, if there's nothing that we can really do with this.

I've looked at other sites when we're coming in here and they can take out a small section and regulate them out from all of the other people and tell us that only these people would have got this kind of X-ray, or this kind of exposure because it was such a small, minute people that would have come in and done this kind of stuff.

Now it's exactly opposite and now they're saying well, we can't.

So my thing is basically what it comes down to with me, I do not know what we're going to come out with in the end.

But we've also got the obligation to be able to look at it. If there's nothing that

we can do with it and that we can't really come to grips with where it's at that's all you can do.

But I just don't want to also cast it off either.

CHAIR KOTELCHUCK: Okay. It comes down to if we ask NIOSH to look further at the cancers it will be informative but not really instructive as to how to move further.

But certainly we would not be tasking NIOSH with a major task to take a look at the folks who have submitted claims.

MEMBER CLAWSON: Let me ask this part of it because Grady and John, this radiography, how much was really done at the site with it?

Was this just the lab part of it that was using this, or who -- do we even know which section was using this?

DR. MAURO: I think it was the Adrian plant. I'm looking at my notes right now to see if it was excluded to only one of the plants.

Right now I'm looking at my notes and I believe it was just one. It might have been

the Adrian plant.

MS. GOGLIOTTI: It was Havens.

DR. MAURO: Oh, Havens? Thank you, Rose.

MEMBER CLAWSON: Because one of my things is this is kind of a unique type of X-ray system. And for some reason they were using this preferably over the other. So there's got to be a reason why they were doing it. And maybe we may be able to send this group down.

MEMBER BEACH: It seems to me -- this is Josie -- there would be a way to identify individuals who worked on that piece of equipment, but I'm not sure at this time. It's been quite awhile ago.

MR. ALLEN: This is Dave Allen. To answer Josie and Dave I did a quick search in NOCTS there and for Havens Lab we have one case with skin cancer on the hands and another one that simply says melanoma, no identification. I don't have time to dig through the record at the meeting here.

But that particular job title for that

was maintenance ---

MS. GOGLIOTTI: Dave Allen?

MR. ALLEN: Yes?

MS. GOGLIOTTI: Just be careful with the amount of information we're sharing.

MR. ALLEN: I understand that. I'm trying to answer the question. That one, by reading the job title you wouldn't think it would be a laboratory analysis like an XRF.

Whereas the other one very well could have. So essentially we have one skin cancer on the back of the hand that this conversation may be applicable to.

MR. CALHOUN: Out of how many? Out of how many claimants?

MR. ALLEN: Well --

MR. CALHOUN: Roughly.

CHAIR KOTELCHUCK: I don't know the Bridgeport Brass, the dimensions.

MR. ALLEN: It's certainly not a huge set. Give me just a minute and I think I can.

CHAIR KOTELCHUCK: Sure.

MR. ALLEN: This is just Havens Lab

that I looked at.

CHAIR KOTELCHUCK: Okay.

MR. CALHOUN: Sixty-five total cases.

CHAIR KOTELCHUCK: Okay.

DR. ANIGSTEIN: According to the TBD, the X-ray crystallography was only at the Havens Lab.

CHAIR KOTELCHUCK: Okay. So, that information is useful and frankly that will go into the record. That will go into the transcript of this meeting so that it will provide at least some vision for future claims about the claims that have come in so far.

And we're talking about less than 2 percent of the claims coming in would have the possibility of perhaps being caused by some sort of exposure to the X-rays.

I think that's helpful and maybe that's all we can do. That will come as a result of this discussion and will be on the record. And maybe that's appropriate for this discussion.

MEMBER CLAWSON: This is Brad again. Maybe this is all that we can do with it, but I

also want to make sure that we've done due diligence on this.

You know, I agree and we're going back a lot of years and I understand that, but a lot of these things that come up we need to just run them to ground. And there's going to be a lot of them that that's all we can do.

I just want to feel comfortable with myself that we did everything that we could. And that's all we can do.

CHAIR KOTELCHUCK: Right. Let me ask you or anyone else to --- specifically what more can we do at this point.

I mean, we have done -- from this discussion we have gotten a measure of the population that possibly could have been affected by this. An upper bound, perhaps.

I can't think of more. Or put it this way, I can't --

MEMBER CLAWSON: Let me ask this of John or any of the people. This crystal radiography. We know the site that it was used at. Do we know the area or for what it was

specifically used for?

DR. MAURO: Just to kick off, my only knowledge is that you use this to understand the molecular structure of the metal. And how --- the type of crystal that's formed so that you can have a better understanding. And I guess it has some relevance to the fuel. This is the extent of my knowledge of the subject.

And why you would do it, and the extent to which it might be done.

Just to get us started that's about all I could offer here.

MEMBER CLAWSON: So this was for the cladding of the fuel.

DR. MAURO: It may have been the cladding or it may have been the fuel itself, I'm not sure.

See after you extrude the fuel and put it under these high temperatures. Unfortunately Bill Thurber's not on the line. He probably is the one person at SC&A that might be able to add a little more value as a metallurgist. He has a wealth of knowledge understanding the crystal

structure. Whether it's the cladding or the fuel itself I don't know.

MEMBER CLAWSON: Okay. This would have been used in a laboratory type setting, correct? This is getting down to the brass tacks of where we've got it all pulled apart and we're looking at what type of --- after the temperatures, the high temperatures that we've had, and what type of crystallization we've got in the metal.

So I think the only thing, what I'm looking at is thinking back through my personal knowledge of the processes, of the fuel processes I've dealt with.

And to me it looks like this would only be a small lab section. And we already brought this up. One of the people that have this don't fall into that laboratory type position and the other one does.

Just if this would be able to be used in that type of a situation to be able to help that person out a little bit more on this skin cancer. I think that's all that we can do. I

really do.

MEMBER MUNN: As far as I know, X-ray crystallography is used as an analysis tool, pre-exposure, post exposure for metals and non-organic systems. In organic systems there's an entirely different thing and I can see no reason in our context that it would ever be used.

So far as I know X-ray crystallography in itself is a very small segment of the entire profession. And there are very few people who are even qualified to do it, and very few machines that are capable of doing it. It's pretty esoteric.

MEMBER CLAWSON: Well, being an ex-X-ray person I kind of dug into this a little bit because it was interesting to me, the process of it.

And actually we've got a few people out here at the INL that actually have performed this. And they've got some new processes now.

That's why it was just kind of interesting with me to see because I could not from the content understand at what point that

they were using this. And that's just where I wanted to be able to -- because it's also a very, very unique process.

Through the years this has changed, the process has changed quite a bit. So have the machines.

CHAIR KOTELCHUCK: Right. Although whatever process was used at Bridgeport Brass was used in the sixties, forties, fifties. And ended in the sixties.

MEMBER CLAWSON: And they were pretty crude, to tell you the truth.

CHAIR KOTELCHUCK: Yes, I could believe that.

But I would like to bring this part of the discussion to an end. And I'm looking for someone to decide or suggest what we should task NIOSH to do if anything beyond what we're --- beyond this discussion.

MEMBER MUNN: This is Wanda. I'll be glad to suggest a one word answer -- nothing.

CHAIR KOTELCHUCK: Okay.

MEMBER CLAWSON: This is Brad. I'll

give a couple of comments. I think we ought to be able to look at the facility that this was used in and just keep --- you know, I don't think there's any way that we can task NIOSH to be able to do a massive amount on this, but to be able to look at the people that are suffering and would have been possibly in this situation to be able to use the crystal radiography.

And have the contents, because it'll mostly come down to skin cancer, just be able to play in -- just be able to allow in the added dose that they probably would have had from that.

CHAIR KOTELCHUCK: Could this be done reasonably either by NIOSH or by SC&A? Could, what Brad said. Does anyone from either of the groups think that that could be done?

MR. CALHOUN: This is Grady. What I believe would have to happen is we'd have to go through 65 cases and look at the actual record of the CATI to see what the individual said their exposure was.

If it wasn't an extremity dose or cancer it's not going to matter.

CHAIR KOTELCHUCK: That's correct.

MR. CALHOUN: We've only got one extremity dose. I may have missed the beginning of this discussion, but I don't know if we even have any indication that there was a problem with this unit if it was not operating as supposed or why we're here looking at it.

I also believe that these types of instruments are somewhat contained. They're not like an open radiography kind of operation.

So the answer is yes, we could do it. We could look through every single case and look to see if anybody said yes, I worked with this.

But again, if it wasn't skin cancer -- or extremity cancer, I'm sorry, we're not going to do anything.

CHAIR KOTELCHUCK: That's correct.

MR. CALHOUN: Really, the best thing to do I think is maybe we could keep it in the back of our head and go forward with this. But we'd have to know that it's really an issue too.

It's a whole lot of time into identifying these people and changing the

approach.

CHAIR KOTELCHUCK: Well, in fact if you're going to look at it it's really only the single person who has the extremity cancer.

We don't know and it's not something for us to discuss here what department or division that person worked in.

However, you folks could take a look at it and see if it's in fact a division or department that might have been involved with the X-ray crystallography.

And then we would have on the record, and we have on the record now that you folks will keep an eye on that for the future.

So if we say nothing more than take a look at that one case. If you will send the Subcommittee a brief report, just an email about the department or division or occupation the person was in, whether that would seem to have any possible relationship to the X-ray crystallography. And then I think that would do it.

MR. CALHOUN: Okay. One more question

though. And again, I apologize. I've had a crazy morning. If I missed something in the beginning of this discussion.

Is --- was there a triggering event here that made us think that there was excessive exposures coming from this, or is this a well maybe it could have happened?

CHAIR KOTELCHUCK: I believe it's the latter.

DR. MAURO: This is John. Nothing that we saw except that it was used, and also except that this issue had recently come up on Carborundum and that sort of triggered why I brought it up.

MR. CALHOUN: Okay. But just for the record we have no indication that this machine was acting inappropriately and people were over-exposed. It's just maybe.

CHAIR KOTELCHUCK: But let me say at the beginning of the discussion which you indicated you missed there was from a number of different folks a feeling that this was early days of X-ray crystallography of this kind and

that in fact there may well have not been the kind of safety protections, the kind of bounding of the instrument that you would find I hope today.

MR. CALHOUN: And would we just assume that it was operating inappropriately to try to come up with a dose approach?

CHAIR KOTELCHUCK: Yes. Or --

MR. CALHOUN: No, you can't do that.

CHAIR KOTELCHUCK: No, no, not inappropriately, just that there were -- the instrumentation back in that period might have allowed stray exposure.

MR. CALHOUN: We can't assume that there were incidents with no indication that there were incidents. We can't do that. It doesn't make sense.

DR. ANIGSTEIN: Bob Anigstein. If I can quote from an excerpt from a report from 1971 symposium, "a number of manufacturers have recently, in the last five years, marketed special shutter assemblies that include various fail-safe features. However, there are still

very many older X-ray units in operation and these must be checked very carefully." This was in the 1970s, about 10 years after that period.

CHAIR KOTELCHUCK: Right. But Grady, I think we are looking at something that we do not have an incident that occurred that's on the record. That is correct.

And there's indication that there could be.

And I would say we're certainly not -- we're certainly trying to be careful not to identify, and Wanda has suggested that we just simply go on with what we have on the record.

I'm trying to think of a way of doing something that's modest that might be helpful in giving us an idea as to what the upper bound is on folks that might have been affected.

And then --

MR. CALHOUN: We'll give you that, I'll commit to giving you the information on that individual and where they worked. That's really all I can do.

CHAIR KOTELCHUCK: And that's fine.

And I don't think we can do more than that either.

So if you would agree to that then my feeling is that I for myself would say we should close it, close this part of the discussion at this point. We have a lot of work to do.

MEMBER MUNN: Agreed.

CHAIR KOTELCHUCK: So, is that okay, folks?

MEMBER CLAWSON: That's fine. As long as it's being addressed. I really don't like to just yes, we've got a problem, we don't know what do with it and go on.

I think that's all you can do, Grady, and I have no problem with it.

CHAIR KOTELCHUCK: Good. Okay. Then I think we're ready to move on. Grady, thank you for doing that and let's go on. Neutron exposure.

DR. MAURO: Yes, we're in the home stretch. We're going to talk a little bit about neutrons and then a very little about the residual period.

Neutrons. The neutron -- NIOSH's position in their latest TBD is that we do have

the potential for some neutron exposures. And there was neutron film badge dosimetry all of which came up with less than the lower limit of detection.

And under circumstances like that very often a dose would be assigned as one-half the MDL but that would not be appropriate because the only kind of neutron exposure you might have experienced --- and that would be unrealistically high.

The only type of neutron exposure that might have occurred is spontaneous fission from the slightly enriched uranium, 2 percent enriched uranium which NIOSH -- the potential for that kind of exposure is extremely small, and it's my understanding that -- so no neutron dose is assigned.

Bob Anigstein did a little homework on that and he said okay, well what kind of spontaneous fission neutron exposures might be experienced from 2 percent enriched uranium. And he can certainly give us more detail.

But the bottom line is that it would

be about 1 percent of the dose from photon exposures which translates to about 12 millirem per year.

So that would be -- and that of course, that would be at a level that would not be detected.

So the fact that the dose is small. They're not less than 1 though. So I just want to bring the Work Group's attention that typically doses that are less than 1 millirem per year are just, you know, neglected and appropriately so when you run these PoCs.

In this case our calculations, Bob's calculations show that well, you might get as much as 12 millirem per year from spontaneous fission and we're just bringing this to the attention of the Work Group and NIOSH on that. So there might be something here. Nothing much, but something.

DR. ANIGSTEIN: I'd like to make one observation. Talking about the 2 percent enriched uranium.

Spontaneous fission is from U-238. U-

238 is four orders of magnitude higher rate than U-235. So it's less with this one and more spontaneous fission.

DR. MAURO: Well, how do you like that. Okay, thanks Bob.

CHAIR KOTELCHUCK: Well, we've been seeing 2 percent enrichment throughout and that's what's consistent with our assumption.

NIOSH folks and other folks and Subcommittee members, this is a finding they propose, SC&A proposes. What do folks think?

MR. ALLEN: This is Dave Allen. Can I say something on that real quick?

CHAIR KOTELCHUCK: Yes, certainly.

MR. ALLEN: Honestly from some of the numbers I ran that percentage, that seems a little high to me but it could be right.

I think depending on some of the assumptions you put in there you could get a variety of numbers that would be a small percentage of the photon dose.

But regardless of that from the actual observation we discussed earlier where that same

model showed 90 percent of the photon dose being greater than 250, meanwhile we're assigning it the mid-range, 30 to 250 which actually overestimates the Probability of Causation because of the radiation effectiveness factor by at least a factor of 2 it seems like this 1 percent dose is covered.

It's pretty insignificant and pretty much irrelevant because if we use this model and then start using the 90 percent greater than 250 on photons overall everything's going to go down quite a bit.

DR. MAURO: Dave, I agree. I think you're right. I agree with that as being a reasonable perspective. When you step out of the box a little bit that's a good way to look at it. Yes.

CHAIR KOTELCHUCK: Which would suggest that you're removing this as a finding.

DR. MAURO: You know, it's a legitimate finding. However, I think that Dave gave a legitimate reason why it could be overlooked.

CHAIR KOTELCHUCK: Right. Based on the assumptions and calculations we've agreed to before.

DR. MAURO: Yes.

CHAIR KOTELCHUCK: Right. Okay. So, it's subsumed in other calculations for other aspects of the dose reconstruction.

DR. MAURO: Yes.

MEMBER MUNN: Okay.

CHAIR KOTELCHUCK: Good. Any other comments from Subcommittee members? Anything you want? I accept that.

MEMBER CLAWSON: This is Brad. That's fine.

MEMBER BEACH: This is Josie. I am also fine.

CHAIR KOTELCHUCK: Okay, good, good. All right. Well, now let's talk about the residual theory.

DR. MAURO: That's going to be easy. There was cleanup in 1962 and measurements made, and more measurements made after that, right up to the time of the FUSRAP cleanup which was much

later.

And there was some data available on what the level of residue was. A little spotty. Some places were a little bit elevated in '62. And some places had elevated photon. It was generally -- it was more due to the fact that the walls were made of brick, hence naturally-occurring radioactivity, so it actually got a little higher as you got closer to the walls.

So the bottom line is that there was very little potential for exposure during the residual period.

And NIOSH concluded that the doses during the residual period were negligible which means less than 1 millirem per year and we agree with that.

So as far as we're concerned the fact that no doses were assigned for the residual period seemed to be justified based on the data.

CHAIR KOTELCHUCK: Okay, good.

DR. MAURO: If you want to talk a little bit about that I could quickly go through.

CHAIR KOTELCHUCK: Unless there's --

I'll hold for a moment in case there's a comment. Otherwise we'll go on. Any comments?

MEMBER MUNN: No comments here.

MEMBER CLAWSON: This is Brad, I don't have any.

CHAIR KOTELCHUCK: Okay. Let's go on.

DR. MAURO: Medical dose. Classic OTIB-6 and everything is fine. That's how they did it in the revision and we concur.

And then finally the claims that were reviewed, their approach was anything that was less than 50 percent PoC was revisited.

Out of all of those cases I think there were a total -- we heard the number before, I think it was about 60.

There was one that looked like reversed. It went from non-compensable to compensable.

CHAIR KOTELCHUCK: Right.

DR. MAURO: And we are totally in support of the fact that they looked at all of the cases that were denied as being their criteria for what they're going to review. So

that's perfectly fine.

And finally we usually conclude here with SC&A's recommended criteria for looking at some claims.

I had written at the time as I've done before perhaps inappropriately so, I usually recommend a minimum of three. But that's not necessarily --- it could certainly be one.

The criteria is that you certainly want to look at --- confirm that the external, internal and medical doses were performed in accordance with the protocol as outlined in TBD.

And the only other --- so that could be one case that could do all that.

But also I like the idea of looking at a skin cancer. And so therefore by doing external and internal medical as a case that could be for a person with an internal dose.

Usually the lung is a good one to pick when you're dealing with uranium and thorium. But also it's probably a good idea to look at skin dose.

And finally, the one reversal is

always an interesting one to look at when you actually have a reversal and see what was the reason that happened. That's always insightful.

So that's our perspective on a general way of how to go about selecting one, two, maybe three cases that would give insight into how this was actually implemented.

CHAIR KOTELCHUCK: You're talking about -- because I was a little -- I mean based on this PER all 50 claims were looked at.

It makes sense to me to look at the one that was flipped. You're suggesting that two of the remaining 49 be looked at in detail with a report perhaps?

MR. KATZ: Let me just explain how this works with PERs. After SC&A reviews and the Subcommittee or Work Group whichever it is reviews all the methodology along with SC&A that was used for the PER.

And so when all that's been done, reviewed, then the last step in a PER review is to pick one or more cases that will illustrate -- that everything that was discussed in terms of

methodology in the PER was applied as specified in the PER, or any changes.

So at this point that's all we're doing is we asked DCAS to come up with cases, one or more, that will address all the different facets that the methodology shows that the methodology applies as indicated.

And so the committee or Work Group's job is just to be very clear about what those criteria are that the one or more cases should illustrate.

And then NIOSH pulls those cases, potential cases, and SC&A reviews them and reports back on the cases. And that closes out the PER review.

CHAIR KOTELCHUCK: Very good. Okay, that's helpful. Thank you.

MR. KATZ: Sure.

CHAIR KOTELCHUCK: So is there any discussion about whether there should be one or three? Three are recommended.

MR. KATZ: So it's really, it's not the number, it's the criteria. In other words

what aspects of the methodology do you want to see illustrated by cases.

CHAIR KOTELCHUCK: Right. They're recommending three cases, any combination of three. Which he's outlined.

DR. MAURO: Let me apologize to the group. We had this discussion just the other day.

Going back in the early days I used to say well you know, if we're going to do a check to all the protocols you probably need about three.

And Ted corrected me then at the previous meeting we just had and I believe that's worth saying again.

That was, the number three is really not the right way to think about this.

I think the right way to look at it is that we want to make sure we pick enough cases that we think of and make sure that they followed their protocol, implemented it for external, for internal, I always like to have skin separate because it's unique, and finally the other

category that is also of interest is you'd like to be able to look at the one that was reversed.

And that really is the criteria. Now that could turn out to be only two cases.

CHAIR KOTELCHUCK: That sounds like it.

DR. MAURO: Right. And so you'll see it in a lot of my work. You'll see me recommending three. And I think that in retrospect that way of thinking about it is not the right way to think about it.

The right way to think about it is the way Ted just explained it.

CHAIR KOTELCHUCK: Okay.

MEMBER MUNN: And as a matter of fact that was precisely what I was going to say, John. I thank you very much.

I don't see any reason at all why, especially in a cohort of this size more than two are necessary.

Certainly we can cover the aspects that are requesting in two if we select them carefully.

CHAIR KOTELCHUCK: That makes sense to me. So I agree with that.

MEMBER BEACH: Well, maybe two with the addition of the skin, or however many skin -

-

CHAIR KOTELCHUCK: Well, the skin will be one of the cases. I mean one of the cases will be one with skin exposure. And we had I think -- I'm sure there are a number.

So skin and examination of the one that flipped. Okay.

So are we settled on two, folks? Is that agreed?

MEMBER MUNN: That would be my recommendation.

CHAIR KOTELCHUCK: I support that. Okay. Hearing no further we'll suggest then the two.

And we therefore will await that result at the next meeting I hope, so that we can close this. Is that correct, that there's no action that we are supposed to take?

We will have one brief report about

the person with skin cancer on the extremity, a note from Grady. Okay?

So that seems to me to close it for the moment. Is that correct?

(Simultaneous speaking)

DR. MAURO: I have nothing to add. This is John.

MEMBER BEACH: So close the discussion until we come back to it.

CHAIR KOTELCHUCK: Exactly, when we get the report. And then the next time we will, if things are as we -- if the review of the claims makes sense to us and we think things are going right then we will approve the PER and that will be it. Right.

Okay. Now, this is -- I've been looking at the clock. It's noontime on the east coast. We often stop.

On the other hand, we have three Set 23 blind dose cases that we want to look at today.

I'll listen to a suggestion about whether we should start on one of them now, go until perhaps 12:30, whatever, and then take a

break. Or would people like to take a break now and just start the three blind dose reconstruction cases after break? Do I hear a recommendation?

Review Set 23 Blind Dose Reconstruction Cases

MEMBER CLAWSON: Let's go for it. It's still early out here.

MEMBER BEACH: I'm okay to go for it too.

CHAIR KOTELCHUCK: I'd like to go for it because it seems to me we've accomplished one important thing today but I'd like to feel like we did more than one thing before lunch. Or lunch for me.

Okay, Rose, do you -- which one would you like to take of the three? You know which one your judgment would be, that it would be ---

MS. GOGLIOTTI: We can go in order but if you want a quicker case the Nevada Test Site case might be the shortest one, I would imagine.

CHAIR KOTELCHUCK: Okay. That sounds like a good suggestion. Then Nevada Test Site it is.

MS. BEHLING: Excuse me one second. Since I'm going to be taking two of them I was actually hoping I could go through maybe just Sandia. I think I can get through that.

MS. GOGLIOTTI: If you want to do the Sandia, as long as the Board's fine with that, I'm ---

CHAIR KOTELCHUCK: We will happily listen to your recommendation.

MS. BEHLING: Okay. It just gives me a break in between the two. And I'll try to be --- not brief, but explain as thoroughly as I can. So if that's okay with everyone, Rose? That means that you don't have two.

MS. GOGLIOTTI: Yes, that's fine.

CHAIR KOTELCHUCK: Sure.

MS. BEHLING: Okay. And actually the agenda says that there are two Sandia cases and Nevada Test Site, and there's actually a Hanford, a Sandia National Lab, and Nevada Test Site. So I'll do the Hanford after lunch then. But I will start with the Sandia National Lab.

And Rose can bring that up because I'm

going to try to be very cautious here in my discussion.

This individual did work at Sandia National Lab in Albuquerque, New Mexico for most of his employment period. He was also transferred to the Sandia National Lab in Livermore, California. And he visited the Nevada Test Site, Lawrence Livermore National Lab, and the Kansas City Plant. So we will be talking about all of those facilities.

There were -- as shown in Table 1-1 there were 11 skin cancers and one I'll say non-skin cancer.

The employment period for this individual was over 30 years combined at all of these different facilities and sites that he visited.

Both NIOSH and SC&A's internal and external doses are shown in Table 1-2. That shows the comparison for all of the cancers.

And if you scroll down you can see that in most cases both NIOSH and SC&A calculated similar doses.

And in both cases the PoCs were less than 50 percent and the PoCs were very close.

So we'll go into the details in section 2. We do a comparison of the parameters that were used and the various documents that were used to determine what the doses were going to be.

Here again this is a multi-page comparison report. And if you scroll down through there's really few differences. I will point out those differences as we go through this case.

As you can see because of the various places that the individual was monitored that made this comparison table quite lengthy.

So if we move onto page 14 we'll start with the occupational external doses. And the individual was monitored at the SNL Albuquerque site for various years of employment.

However, there were only positive, or greater than LOD over 2 results for two years.

Both NIOSH and SC&A assumed 100 percent AP geometry and energy fraction of 30 to

250. And applied the appropriate DCFs from the Implementation Guide, the External Implementation Guide.

One of the things you'll hear me state throughout is for all of the external doses or most of the external doses NIOSH applies, and we talk about this routinely and I'll just remind everyone they apply for these assessment cases a Monte Carlo approach to applying those DCF values.

In other words when you go into the Implementation Guide there is a minimum and a maximum DCF value and a mean DCF value. They use a Monte Carlo program, I think BOSS is what they were using, to sample, randomly sample those DCF values and apply that to the dose.

Where SC&A, when we go through these, we just use that mean value consistently. And so that's often what -- where you're going to see some minor differences in dose. And I'll be mentioning that throughout.

So, let's go onto page 15. As I said there were similar assumptions made except for

NIOSH using the Monte Carlo for applying the DCF values. And so there is where there was some slight difference in the doses that were calculated.

Now the individual also visited the Sandia National Labs in Livermore. There was only one year of monitoring, external monitoring that showed positive readings of greater than LOD over 2.

NIOSH used 100 percent 30 to 250. And in this particular case SC&A assumed that the individual worked in a building that did not specify that we use 100 percent 30 to 250 but instead used 5 percent less than 30 keV, 45 percent of 30 to 250 keV energy --- photon energy, and 50 percent of greater than 250 keV energy.

Again, similar doses were calculated by both methods. The only difference again is that NIOSH used the Monte Carlo and that resulted in the doses being entered into IREP as a Weibull distribution versus SC&A entering the dose as a constant.

Also, the visits to the Nevada Test

Site. The individual was monitored. However, all of the monitoring indicated that the doses were less than the LOD over 2 and so these doses were treated as missed dose which we'll talk about next.

Under section 2.1.2 is the missed photon doses. And at the SNL site in Albuquerque NIOSH looked at the records and counted 53 badge exchanges that represented less than one-half the LOD value.

And they applied that LOD over 2 value as appropriate for the various time facilities -- or the various time intervals.

They also applied appropriate DCF values and again they applied those using the Monte Carlo methodology.

SC&A counted 52 zeroes, used the same LOD and DCFs and applied these consistently using the mean value.

And even though SC&A counted one less zero, just the fact that we applied the DCFs differently our doses were slightly higher for the non-skin cancer. The skin cancer doses were

all calculated the same. Or very close, I should say.

If we move on then to the Sandia National Lab Livermore period of time for employment NIOSH -- now in this case NIOSH indicated that they combined the missed doses from the three sites that the individual visited.

However, when we went into the records we actually realized that in the workbook they used eight zeroes, they calculated eight zeroes for calculating a missed dose.

And they assigned those doses for a two-year period and they again assumed 100 percent of the 30 to 250 keV.

And consistent with what SC&A did with the recorded photon doses they used the energy fractions again of less than 30, 30 to 250, and greater than 250 as they did with the recorded.

And they counted -- SC&A counted nine zeroes and assigned dose for three years.

And again if you look at the doses that were calculated by both, very consistent.

We will move on then to NTS on page

17. Here again for the missed dose both SC&A and NIOSH counted 17 zero or less than LOD over 2 badge exchanges.

They applied -- they both also applied a dosimeter correction factor of 1.25 to these values.

NIOSH used 100 percent 30 to 250 for all of cancers and the only difference was that SC&A again applied -- they assumed a 25 percent 30 to 250 and 75 percent greater than 250 for the non-skin cancer.

And dose to skin were very similar. Only difference is because of the difference in assessing the CCF values in the Monte Carlo is really what created minor differences.

Going on to section 2.1.3 is unmonitored shallow dose or electron dose. For the employment at the Sandia National Lab Albuquerque, NIOSH assigned unmonitored electron dose to the skin for one year. And NIOSH --- I'm sorry, SC&A did not assign any unmonitored shallow dose. That resulted in one year 22 millirem.

For the Sandia National Labs Livermore employment and NTS visits neither SC&A nor NIOSH assigned any unmonitored shallow doses.

If we move on to missed shallow dose on page 18 for the Sandia National Labs Albuquerque site employment both NIOSH and SC&A assigned missed shallow dose based on guidance in OTIB-17 and used one-half of the LOD values and assigned that dose as greater than 15 keV energy.

Both entered those doses as a lognormal distribution with a GSD of 1.5 and they came up with identical dose.

There was no assignment of missed shallow doses for the Sandia National Labs Livermore or NTS.

Now if we move on to recorded neutron doses the EE was monitored for neutron exposure while employed at the SNL Albuquerque site.

There was only one year that showed a positive result. Both NIOSH and SC&A used the neutron to photon ratio for calculating that dose, applied the ICRP-60 correction factors and assigned that dose as 100 percent 0.1 to 2 MeV

energy range.

A slight difference again in doses, but you can see there is just again due to applying the Monte Carlo technique.

At SNL Livermore, NTS and the Lawrence Livermore National Lab the individual was not monitored for neutrons at Sandia National Labs Livermore and NTS, and there was one record indicating that neutron monitoring was done at Lawrence Livermore.

But that was less than the LOD over 2 so it was treated again as missed dose.

And if we go on to section 2.1.6 the missed neutron dose, again missed neutron was calculated for employment at Sandia National Labs Albuquerque.

Prior to 1972 neutron to photon ratio was used and thereafter the appropriate one-half NDA value was used.

The difference was NIOSH assumed 25 zeroes, or 25 missed neutron doses, and SC&A assumed 24.

I believe NIOSH included -- the

difference in the one extra zero was that NIOSH included the missed dose from the Lawrence Livermore facility.

Both assumed 100 percent of 0.1 to 2 MeV. But again NIOSH applied the Monte Carlo techniques.

If you look down at the second paragraph there you can see doses were similar. The difference is due to the difference in Monte Carlo and also that NIOSH included that one year of missed neutron from Lawrence Livermore.

Going down then to what is marked as Sandia National Labs Livermore when SC&A reviewed the records they -- they misinterpreted the Lawrence Livermore report, or they looked at the Lawrence Livermore report and actually assigned that one missed neutron dose to Sandia National Labs Livermore.

And so therefore they calculated the doses based on the Sandia National Lab Livermore TBD which specified 5 percent of 10 to 100 keV, 70 percent of 0.1 to 2 MeV, and 25 percent from 2 to 20 MeV.

They also applied the ICRP-60 correction factor which resulted in the modest dose of 4 millirem.

That was entered into IREP as a lognormal distribution with a GSD of 1.2.

If we go onto the onsite ambient dose both NIOSH and SC&A assigned onsite ambient dose for periods when the individual was not routinely monitored.

NIOSH assigned that dose for most -- what am I --- let me see here -- for some years, assuming that the individual was at the Sandia National Labs Albuquerque in technical area 1.

They also adjusted the dose for partial years of employment and adjusted for 2,500 hours per work year rather than the -- assuming that he worked overtime, than the 2,000.

They applied an isotropic DSF value and the doses were modest.

There was a three-year period where they assumed that the individual worked -- or they assigned the onsite ambient using the Sandia National Labs Albuquerque TBD which included

doses from photons and neutrons.

And so as you can see on page 20 about halfway down, okay, you have it up there. Again the doses were relatively modest but higher than what SC&A calculated.

SC&A assumed that the individual was in the technical area 1 and technical area 4 throughout the employment and assigned that dose based on the TBD associated with Sandia National Labs Albuquerque.

SC&A did not adjust for partial year dose and our doses were -- SC&A's doses were somewhat lower just due to the fact that they based the entire onsite ambient dose on the Albuquerque TBD.

And going onto occupational medical doses. Both NIOSH and SC&A reviewed the records that indicated that the individual was given eight PA exams and two lumbar-spine exams.

NIOSH assigned dose -- the medical exposure for two years using Sandia National Labs Livermore TBD because it was more claimant-favorable.

And then for the remainder of the medical doses they assigned it using the information and guidance from the Sandia National Labs Albuquerque TBD.

SC&A used the Albuquerque data TBD 37 for all of the doses. And Table 2.2 a little further down on page 21 shows you the difference in the medical doses that were calculated by NIOSH and SC&A.

Both methodologies entered those doses into IREP as normal distribution with a 30 percent uncertainty.

And NIOSH's higher dose to the non-skin cancer is due to using the Sandia National Labs Livermore more claimant-favorable medical doses for two of the years.

Internal doses. If we move on to page 22 NIOSH assigned dose based on just an occupational environmental dose I should say, an environmental dose.

The individual wasn't monitored, didn't have any bioassay monitoring so the dose was based on environmental.

NIOSH methodically went through each of the locations and assigned dose based on location of the individual being employed at the Albuquerque site, NTS for the appropriate years, Sandia National Labs Livermore, and the Lawrence Livermore facility.

And at Table 2.3 you can see the doses that they calculated for each of the 11 skin cancers and the 1 non-skin cancer.

SC&A, they restricted their environmental internal doses and assumed that the individual was at the Sandia National Labs Albuquerque site and also -- throughout most of the employment and also included the NTS visits in calculating their doses.

And that resulted in less than 1 millirem and so values were not even included in IREP.

That is the summary. I won't necessarily go back through the differences in doses because they were fairly modest.

All of the total doses were relatively close. PoCs were close. But if anyone has any

questions or needs further explanation on any of the calculated doses I'm willing to answer them if I can.

CHAIR KOTELCHUCK: Any questions? Comments?

MEMBER MUNN: This is Wanda. I don't have any questions, but I do have a comment.

Whenever we go through a complicated case like this one where the individual has multiple sites involved and therefore multiple environments that must be taken into consideration, this process that we go through right here is the most revealing I think that we encountered in this entire program.

I'm continually amazed at how well both our NIOSH folks and our contractor people address things that are just one step beyond the common thinking of things like energy fractions.

I'm always a little puzzled about how I would go about approaching that.

Missed dose and unmonitored dose and methodologies that -- the decisions that are involved there. The type of distribution that's

chosen to analyze the data, it's just so well done by both groups that when we go through this it is an astonishment to me that within the range of scientific knowledge, the types of approaches that are taken are close enough but variable enough to give me an enormously large sense of satisfaction that every rock has been turned.

So I thank both the NIOSH folks and the SC&A folks who do this work because I personally think it's astonishing. And we on the Board don't really see it until we have cases of this type.

So I think the report was very well done as was the original case. And thank you all.

CHAIR KOTELCHUCK: And I second that. For multiple cancers at multiple sites over decades and you're able to come out with results that are really extraordinarily close on independent review.

It is impressive and it gives one much faith certainly in the precision with which the dose reconstruction process is carried out.

A fine job and good result. I think the results speak for themselves. Further? Do we wish to --

MEMBER CLAWSON: This is Brad. No comment. I echo what both of you just said. It's a great job. No comments.

CHAIR KOTELCHUCK: Yes. Good, good. So can we move that we accept this?

MEMBER MUNN: So moved.

CHAIR KOTELCHUCK: Okay.

MEMBER BEACH: I agree.

CHAIR KOTELCHUCK: Very good. So all in favor, aye.

(Chorus of ayes)

CHAIR KOTELCHUCK: Negative or abstain?

(No response)

CHAIR KOTELCHUCK: No, okay. Folks, wonderful job and we end before lunch on a high note.

It is now 12:35 Eastern Standard Time. So let's take a break and get back together at 1:35. Okay?

MEMBER MUNN: Okay.

CHAIR KOTELCHUCK: Good. Thank you all.

(Whereupon, the above-entitled matter went off the record at 12:34 p.m. and resumed at 1:37 p.m.)

CHAIR KOTELCHUCK: All right, very good. We have a quorum so now let's see. Which one are we going to start --- which one of the two remaining lines are we starting with?

MS. GOGLIOTTI: I have NTS up on the screen so if you don't mind we'll start there.

CHAIR KOTELCHUCK: Okay.

MS. GOGLIOTTI: Is everyone ready to get started?

CHAIR KOTELCHUCK: Okay. Sure.

MS. GOGLIOTTI: Okay. This is an NTS employment case. You can see here from the screen the EE had a number of cancers, all fairly localized in one area of the body. And they were all diagnosed within the last 10 years or so.

NIOSH and SC&A both did their dose reconstructions and we both had a PoC of less

than 50 percent. And so the case was not compensated.

From Table 1-2 here you'll see that for the most part our doses were very, very close. The only differences really are in missed photon dose, 3 millirem in medical dose and 13 to 14 millirem in environmental dose.

Our PoCs are very close together. You see that there were several employment periods that lasted over 27 years but the EE worked on and off.

Their job title could be said to be non-rad worker.

They were monitored for external dose but only a single monitoring of the whole body count for internal dose. And that was a termination scan.

Table 2-1 shows what NIOSH did versus what SC&A did. Ultimately they're very, very close. There's a little bit of difference in the PoC values but nothing substantial.

For reported photon dose NIOSH and SC&A defined exactly the same dose, we both used

25 percent 30 to 250 keV photon and 75 percent greater than 250 keV photon.

We both used the same dosimeter correction factor of 1.25 and the same organ dose correction factor of 1.

And because we used the same values we came up with the same results. For missed photon dose there was a slight difference. We both came up with 291 exchanges for zero dose, which is pretty good.

The difference really comes in the year 1971 which was the year that the dosimeters changed and we just have a slight change in LOD from 40 millirem per year to 30 millirem per year.

NIOSH assumed nine zeroes at the 40 millirem and four zeroes at the 30. And SC&A assumed 2 at the 40 and 11 at the 30.

MR. SIEBERT: Kathy, I'm sorry. This is Scott.

I just want to point out that's a misprint. We actually assigned 4 at the 40 millirem and 9 at the 30.

MS. GOGLIOTTI: Oh, okay. Thank you.

MR. SIEBERT: That's okay. No problem.

MS. GOGLIOTTI: And then we also -- SC&A did not assigned a TLD correction factor of 1.1 for the years 1987 and 1988. They basically cancel each other out, resulted in a difference of about 22 millirem between the two dose reconstructions.

For unmonitored shallow dose SC&A and NIOSH assigned basically the same dose again.

Onsite ambient dose, neither one of us assigned the ambient dose.

For medical dose really the 3 millirem difference on two of the cancers comes from the choice of which location on the body to assume that the X-ray occurred at.

With these particular cancers the slight difference in where you choose can be a slight difference in dose. Nothing substantial. You see it's a 3 millirem here.

For occupational internal dose we both assigned dose. The EE only had the one termination whole body count.

NIOSH chose to use I believe the best estimate approach for assigning internal dose and SC&A used the maximizing approach that resulted in NIOSH assigning less than 1 millirem dose per year and SC&A assigning between 13 and 14 millirem per year.

Overall we were very, very close in dose reconstruction. You'll see here again on summary Table 3-1 just a little bit of difference in external and internal dose, but overall nothing substantial.

Were there any questions?

MEMBER MUNN: None here.

CHAIR KOTELCHUCK: Questions?

MEMBER BEACH: I don't have any.

MEMBER CLAWSON: Me neither.

CHAIR KOTELCHUCK: Again, very fine, very good agreement. Any other? So folks, if there's no further questions. This seems fairly straightforward. Should we accept?

MEMBER MUNN: So moved.

MEMBER CLAWSON: Second.

CHAIR KOTELCHUCK: Okay. Good.

Agreed. All right. So, all those in favor, aye.

(Chorus of ayes)

CHAIR KOTELCHUCK: Any opposed?

(No audible response)

CHAIR KOTELCHUCK: Abstain?

(No audible response)

CHAIR KOTELCHUCK: All right. So, that's approved. My goodness, fairly quickly. And we have our last one now.

MS. BEHLING: Yes, this is Kathy and the last one is the Hanford site. And while Rose was bringing this up I wanted to just make a comment that adds onto something that Wanda had said earlier.

I hope you don't mind me adding this, but I have to say I also find the lines very revealing. And I enjoy doing them and really teasing out the differences.

And I think that one of the things that we find when we have a case like this line that Rose was just showing when you have a closeness like that it shows -- it really reflects to me the descriptiveness and the

thoroughness that was put into the TBD itself.

And I hope I'm not opening up a can of worms here by asking this question, but when we do these slides, when we work with lines, sometimes it seems like some of the AWE sites, it might be appropriate to do those because we've found in the past that the guidance sometimes for some of these sites was not quite as descriptive.

Are we still assigning a blind circuit with AWEs or not?

MR. KATZ: We are. Actually I think in set 24 there are.

MS. BEHLING: There were one or two. Okay. Okay, I was just curious. I just thought I would throw that out there.

CHAIR KOTELCHUCK: And we're also looking, are we not, at these today. We have partial -- these are partial dose reconstructions.

MS. BEHLING: They are considered partial in some cases because of SEC issues.

CHAIR KOTELCHUCK: Right.

MS. BEHLING: I'll be talking about

that in this particular case.

CHAIR KOTELCHUCK: Right. So that also seems to me a step forward because we started out -- initially we started out with ones that we had done the full dose reconstruction.

And then we're slowly broadening out. And this is all good.

MS. BEHLING: Okay. Thank you for letting me share.

CHAIR KOTELCHUCK: Sure, absolutely.

MS. BEHLING: Okay. If you're ready we'll move onto this last one from the 23rd set.

This individual worked at the Hanford site in Pacific Northwest National Laboratory and also the Iowa Ordnance Plant.

As you see in Table 1-1 there were a total of five cancers, four of which were skin and one a non-skin.

And if we move on to Table 1-2 you'll see the employment history for the various sites. And this individual worked for a total of about 40 years.

So NIOSH and SC&A doses are shown in

the comparison table on page 9, Table 1-3. And again as you look down through the doses it shows that most doses are very similar. The largest difference is reflected in the first non-skin cancer under the internal dose. And we'll go into why that difference occurred.

Both NIOSH and SC&A calculated PoCs that were less than 50 percent.

So if we move on to section 2, Table 2.1 shows comparison again of the data and the assumptions used by NIOSH and SC&A.

And once again I won't go into details but this table goes on and on for several pages because of all of the doses that were calculated and the fact that there were the Hanford, PNNL sites and also the IOP, the Iowa Ordnance Plant.

So we'll move ahead to section 2.1 and talk about the occupational external exposures.

And the reported photon dose at the Iowa plant due to the SEC only those doses that were actually recorded in the individual's file are able to be used for reconstructing the doses.

In this particular case the EE was

monitored and had positive dosimetry readings throughout several years.

So NIOSH and SC&A assumed 100 percent 30 to 250 energy range and applied applicable DCFs.

Again, NIOSH used Monte Carlo technique for applying those DCFs which resulted in the doses being entered into IREP using a Weibull dose distribution as opposed to SC&A entering those doses as a constant distribution.

We move on to the Hanford PNNL facility. At Hanford the individual worked primarily in the 200 and 300 areas and Table 2-2 shows the time periods that both NIOSH and SC&A assumed that the individual worked in those areas and the dose distribution that was used and also the DCF values for the skin and non-skin cancers.

NIOSH assumed for a period of time that you can see on the table that the EE worked in a known neutron area. And that resulted in them using 100 percent 30 to 250 keV for that time period where SC&A assumed that the individual did work in an area with potential

neutron, and so therefore their dose distribution was 25 percent below 250 and 75 percent greater than 250.

Then if we move down to Table 2.3 you see the doses that were assigned by NIOSH and SC&A for each of the cancers.

The recorded doses. NIOSH's about 133 millirem less than SC&A for the non-cancer is primarily because of the Monte Carlo issues of assigned DCFs.

And if you move on then to missed photon doses for the work at the Iowa plant both NIOSH and SC&A counted 61 missed badge exchanges and both assigned 100 percent 30 to 250 keV and applied DCFs differently as they did with the recorded doses.

At Hanford the missed photon dose, here again at least based on what I could understand -- what I could determine from the workbooks NIOSH indicated in the dose reconstruction report that they counted 59 zeroes total. When I went into the workbook it looked like they actually used 31 and I think that was

just a typo.

SC&A also counted 31 missed badge exchanges. Both assumed LOD over 2 based on TBD data. And again NIOSH applied the Monte Carlo approach for the DCFs and therefore there was a slight difference in the dose to the cancer that was not the skin cancer.

If we go onto recorded shallow dose the EE was not monitored for shallow dose at the Iowa site and therefore none was calculated based on the SEC.

At Hanford the shallow dose for the first cancer was based on the Implementation Guide 1 and assumed less than 30 keV for work in plutonium areas.

And in this particular case they also selected the DCFs from a table in the Implementation Guide associated with special dose conversion factors for plutonium.

Both assigned shallow dose to the skin using OTIB-17 and a greater than 15 keV assignment was for when the individual worked in non-plutonium areas and less than 30 keV for when

the individual worked in what were considered plutonium areas.

In addition, for one of the skin cancers NIOSH assumed that that area would be covered with clothing and applied a 60 percent clothing attenuation factor.

SC&A did not apply that clothing attenuation factor and also assigned the dose as greater than 15 keV for the skin cancers and less than 30 keV for the additional cancer. Okay. Again doses were very similar.

If we go on to missed shallow dose for the Hanford facility both NIOSH and SC&A assumed -- counted 34 zeroes or less than LOD over 2.

Again, the differences were just NIOSH assuming --- or applying the Monte Carlo versus SC&A using a median DCF value.

And again, NIOSH did apply a clothing attenuation factor for one of the skin cancers and SC&A did not do that. Again, doses were very similar.

We move on to recorded neutron doses. The individual was not monitored for neutron

exposure at the Iowa site. For Hanford there was one positive neutron reading and NIOSH assumed that the EE worked in the 200 area and therefore divided the energy by 90 percent 0.1 to 2 MeV neutrons and 10 percent 2 to 20 MeV.

Once again NIOSH applied Monte Carlo with the DCFs. Also used an ICRP-60 correction factor and ended up with doses again that were similar to SC&A but they were entered into IREP as a Weibull distribution for the non-skin cancer.

SC&A assumed that the EE worked at the PNNL site in a specific building that would allow them to assume that the neutrons were 100 percent 100 to 2 MeV -- 100 keV to 2 MeV, I'm sorry.

SC&A also applied the ICRP-60 correction factor and again the doses were similar to those calculated by NIOSH.

If we go on to missed neutron doses in this particular case NIOSH counted 43 missed doses for neutron and SC&A counted 47.

The same energy fractions, DCFs and ICRP-60 correction factors were used. And both

applied dose correction factor of 1.35 for the years specified in the Technical Basis Document.

Doses were similar. SC&A's slightly higher dose was due to counting 47 versus 43 zeroes.

If we go on to onsite ambient dose, onsite ambient is not available at the Iowa Ordnance Plant and therefore it was not calculated.

For Hanford both NIOSH and SC&A assumed that the individual was in the 200 area and used dose data from Table 4-8 of the Technical Basis Document.

NIOSH also used an isotropic DCF value and assumed a 2,600 hour work year.

They also adjusted the employment for partial years of employment. SC&A did not do that adjustment, but again there were similar doses and the difference in doses was primarily due to the partial years of employment not being assumed by SC&A.

If we move on to the medical doses there were no medical records for the Iowa, but

both NIOSH and SC&A based the medical dose on guidance in the TBD and doses from OTIB-6. The individual was assigned an annual PA chest and lumbar spine for various years as specified in the TBD.

And Table 2-4 compares the medical doses calculated by NIOSH and SC&A. And as you can see they are very similar.

Going on to Hanford-PNNL medical records in this case both NIOSH and SC&A used the records to find medical doses.

The individual did receive X-ray exams for nine years. And both used the applicable tables from the TBD and calculated similar or nearly identical doses as you can see.

Okay. Now we're going to move into the internal which is where it gets a little bit more interesting.

For the occupational internal doses the individual was not monitored at Iowa and so there was no dose calculated based on the SEC.

For the Hanford the individual was monitored for plutonium and uranium by urinalyses

and also fission products by whole body counts.

All of the plutonium bioassays were less than MDA. Now, NIOSH assumed -- in this particular case NIOSH's methodology used IMBA and one-half of the MDA value to calculate intakes.

They assumed 100 percent plutonium-239. They compared solubility types M and S with type S being the most claimant-favorable.

They started employment at the beginning -- the beginning of employment -- they calculated the intakes using the start of employment through 1978 which does not represent the termination data. The termination urinalysis. They decided that that was -- I assume was a low intake and they did not include that in their calculation, in their fitting calculation for determining the internal dose for plutonium.

Because type S was the highest intake they also considered type super S and all the doses were multiplied by a factor of 4.

With SC&A they also used IMBA. However, they ignored the first bioassay at the

beginning of employment and their fitting calculation started with the following bioassay, but they did include the urinalysis for the termination urinalysis results.

So, even though they used similar assumptions such as the 10-year aged fuel grade plutonium because of using different date ranges in their fitting calculation their alpha intake was a lot higher than what was calculated by NIOSH.

And Table 2.5 shows a comparison of the doses that were calculated using these two different fitting approaches.

And if we go on to the internal dose from uranium, section 2.2.2, all of the uranium bioassays were less than MDA.

Both NIOSH and SC&A compared chronic and acute intakes. And NIOSH compared types M and S solubility where SC&A compared intake rates for all three solubility types, F, M and S.

Everyone concluded that type S was the largest intake and they also considered recycled uranium in the calculation but that -- this

calculation resulted in doses of less than 1 millirem. Because the non-skin cancers actually came out to 1 millirem so NIOSH did assign 1 millirem for that non-skin cancer.

Now, with regard to the fission products there were whole body counts that showed greater than limits of detection for cesium-137, zinc-65, and sodium-25.

NIOSH followed guidance in accordance with the Hanford TBD which states that intakes should be -- mixed fission intakes should be based on guidance in OTIB-54 which is fission and activation product assignment for internal doses.

And their calculation based on that came up with a total fission product dose which is shown on page 24 of 180 millirem to the non-skin cancer and 20 millirem to the four skin cancers. I'm sorry, I'm jumping ahead here. That was coworker dose.

Let me see here. Okay, let me go back. I got ahead of myself.

For the other mixed fission doses NIOSH used the strontium-90 as the indicator

radionuclide and data from Table 7.3 of OTIB-54 and calculated -- I'm trying to see where I entered their dose. They assumed type S, strontium-90 and levels below LOD. And in addition they added the coworker dose for a period of '75 through '77 and that total dose then came to 180 for the total fission and activation product dose for the non-skin cancer and 20 for the four skin cancers.

When SC&A looked at the guidance in OTIB-54 they concluded that -- and if we scroll down to the bottom of page 24 they concluded that for other mixed fission products OTIB-54 did not apply.

And they base that on the statement that is shown at the bottom of page 24 which indicates that when assigning the radionuclide specific intakes for the mixed fission and activation products it's assigned when air sampling or urinalysis data associated with reactors or reactor fields are available only as gross or total beta activity, or gross or total gamma activity.

And therefore since this fission product dose was based on whole body count SC&A concluded that it wasn't appropriate to use OTIB-54.

They instead used, and this is on page 25, they instead used the Hanford Radionuclide Chooser Workbook and assumed cerium-144 as the most claimant radionuclide type S.

CHAIR KOTELCHUCK: Hi, could you speak just a little louder, please?

MS. BEHLING: Okay, I'm sorry. To go back SC&A decided that if they weren't able to use the OTIB-54 document they used the Hanford Radionuclide Chooser Workbook and that -- they then decided to use the cerium-144 type S for their default radionuclide.

And that resulted at least for the non-skin cancer in a very much higher dose, 33-fold higher dose from NIOSH of 6.54 rem.

So, we included in this particular blind comparison an observation which we usually don't do, but because of SC&A's inability to determine how to interpret OTIB-54 we felt we

should make mention that perhaps the guidance in OTIB-54 could be somewhat more definitive, or there could be some priority put in there so that we could understand how OTIB-54 could be used in this particular case.

And we can get back to this issue. I'll just finish this out.

Both NIOSH and SC&A also calculated environmental internal dose based on the Hanford Technical Basis Document Table A-12 and both resulted in doses of less than 1 millirem.

So, that -- section 3 then sums again all of the doses, external and internal. And really the primary difference obviously is the assignment of the mixed fission product dose where SC&A used a completely different approach than the OTIB-54 because they didn't think it was appropriate.

So I guess we need to have a discussion.

MR. SIEBERT: This is Scott. I can address that.

MS. BEHLING: Okay.

MR. SIEBERT: There's actually two pieces to that.

Number one, if you review OTIB-54, not just section 2.0, but section 3.0 and section 8.0 it does specifically state that it can be applicable to in vivo results as well as long as it's discussed how they are appropriate.

That's kind of a side point because the main point is that in this case we did not apply OTIB-54 to whole body counts. We actually applied it to urine sampling results.

And let me kind of explain the process that went through that may have been missed while looking at the case.

The individual did have whole body counting during a significant time frame which we use as an indication that there is exposure potential through fission products.

As you all know we used the chooser for a long time but you remember the many discussions we had on that, that the cerium-144 MDA is much, much larger than anything else and it always drives the chooser dose, and usually

assigning very large intakes that seemed unreasonable.

Once we started having coworker for Hanford we realized what we could do was instead of using the whole body count samples as an indicator radionuclide for intake, rather than use it as an indicator for exposure and realize that for strontium-90 an individual who is unmonitored during that time frame we can use the coworker unmonitored values which are based on urine.

And we use the coworker intakes for strontium-90 and then we apply the OTIB-54 mixed fission products suite on top of the strontium-90 results rather than the whole body counts.

MS. BEHLING: And what section of the OTIB-54 were you referring to that was not included in this comparison? Can you just tell me that? Was that section 5?

MR. SIEBERT: 3.0 and section 8.0 discuss in vivo.

MR. STIVER: This is John. If you look at the bottom of page 24 of OTIB-54 it's

section 8 Scott's referring to. They don't provide any guidance for how to interpret whole body count.

As far as I remember the employee had whole body counts and not urinalyses.

MR. SIEBERT: Exactly, which is why he's unmonitored for strontium and we assign the strontium coworker unmonitored intakes and apply OTIB-54 to those intakes, strontium intakes that are based on urinalysis.

So the whole idea that OTIB-54 doesn't apply to in vivo kind of is an off to the side discussion in this because we didn't do that in this case to start with.

But I just point out that there is discussion in OTIB-54 that it can be applicable to in vivo.

Now, we agree that there have to be further discussions as to whether it's applicable, where it's applicable and things like that. But that's outside of the scope of this review because we didn't use it in this case for whole body counts.

MS. BEHLING: John, do you have any more to add? Because it's confusing to me.

MR. STIVER: I guess it's confusing because the employee actually had whole body counts and not urinalysis.

MR. SIEBERT: Correct. The whole body -- of exposure. However we don't have strontium-90 urinalysis from the employee. So we're in a situation where they're unmonitored for strontium-90.

So what we do is we apply the strontium-90 unmonitored coworker doses to the employee.

If you look at the OTIB-54 files that are in the case those are the strontium-90 intakes that are applied during that whole time frame. It's not based on the whole body count in applying OTIB-54 to it.

MS. BEHLING: This is Kathy. Scott, so you used OTIB-54 just Table 7-3 for the indicator radionuclide and activity fractions. Is that what you're saying? For the other mixed fission dose.

MR. SIEBERT: I don't know, I'm not looking at the specific tables at the moment but that sounds correct. Go ahead.

MS. BEHLING: I'm sorry. So that's how you selected your indicator radionuclide from the guidance in OTIB-54. But then when you calculated the doses you actually used coworker dose for that time frame and assuming strontium-90. Is that what I'm understanding?

MR. SIEBERT: I'm sorry, I didn't understand what you were asking.

MS. BEHLING: Okay. I believe what you were saying is that you didn't actually use OTIB-54, but I thought what I was hearing is that you selected strontium-90 as your indicator radionuclide based on OTIB-54 but then to calculate the dose you used coworker dose, 50 percent coworker dose for strontium-90.

MR. SIEBERT: Well, the individual is not monitored for strontium.

MS. BEHLING: Right.

MR. SIEBERT: So we assigned coworker strontium based on the fact that they are

unmonitored at that time frame.

Because we're assigning coworker strontium we also used that as the indicator for OTIB-54, all the rest of the mixed fission products that would come along with it.

MS. BEHLING: Okay. And correct me if I'm wrong, but our thought was fission products were -- the individual was monitored for fission products using the whole body count data.

And therefore when we read the section of the OTIB-54, we assumed it didn't apply. That was your thinking?

MR. SIEBERT: I could see how you could read it that way, yes.

MR. STIVER: Yes, because all the employee had was whole body counts for fission products.

MS. BEHLING: For fission products, exactly. And I guess this points out that perhaps there should be some clarity added to OTIB-54. Maybe that's outside this discussion, but it just seemed to us that if we didn't feel it applied perhaps that OTIB needs to be clarified or more

details added to the guidance.

MR. SIEBERT: We're looking at it on our side and we agree that I could see how it is not necessarily crystal clear, since it's a very confusing issue.

So we're looking at perhaps making the guidance a little more clear. I think that's a reasonable assumption, yes.

CHAIR KOTELCHUCK: That's good. That makes sense to do.

MS. BEHLING: Well, the good thing I guess is that even though we used -- we did use a conservative assumption by using -- and I agree with Scott, the Hanford radionuclide chooser and selecting cerium-144 is an overestimate.

But it did result in doses that were quite a bit higher. But those PoCs were still below the 50 percent.

CHAIR KOTELCHUCK: Those PoCs were still similar. We have had PoCs that differ by a couple of percent in the past.

But there has been clarity now about why SC&A's is larger. And presumably that NIOSH

will continue using its procedures as it has. And perhaps write them up a little more, in a little more detail. That particular issue. Yes?

MS. BEHLING: That's what I'm hearing from Scott.

And John, did I miss anything that you want to add?

CHAIR KOTELCHUCK: Do folks want to ask, do other members of the Subcommittee have questions or comments?

MEMBER CLAWSON: I'm just, I was struggling to follow the chain of thought that they were going through on this.

And I understand what we came down to, but I'm with Kathy, something has got to be a little bit more clear.

CHAIR KOTELCHUCK: And the NIOSH people are committed to clarifying it a bit.

Still, in my opinion there's basic agreement. And even with the difference as large as the one that we're looking at there isn't a change in decision.

Although of course if this were to

occur with a PoC closer to 50 percent in the first place then it could result in a flip. But it did not in this case.

Folks, should we accept this?

MR. KATZ: It's just you and Brad.

CHAIR KOTELCHUCK: Yes, indeed. You are right.

MEMBER CLAWSON: Just you and me.

CHAIR KOTELCHUCK: Okay. Well, I think we are in agreement. So if you'll move that we accept I will second.

MEMBER CLAWSON: Okay, I move.

CHAIR KOTELCHUCK: Okay, and I will second. And so we agree --

MEMBER POSTON: Don't forget me.

CHAIR KOTELCHUCK: Pardon?

MEMBER POSTON: Don't forget me.

CHAIR KOTELCHUCK: Thank you. Yes, indeed. Yes, indeed. All right. Do you have further comment?

MEMBER POSTON: No.

CHAIR KOTELCHUCK: Okay. Then thank you very much.

MEMBER CLAWSON: He just wants to be a part of the conversation.

CHAIR KOTELCHUCK: Right. You were quiet enough as you sometimes are but you're there and we are very happy you are.

MEMBER POSTON: It's an unusual role for me so I thought I'd be quiet.

CHAIR KOTELCHUCK: Right. All right. Anyhow. So those in favor of accepting the report, aye?

(Chorus of ayes)

CHAIR KOTELCHUCK: Opposed?

(No audible response)

CHAIR KOTELCHUCK: And abstain?

(No audible response)

CHAIR KOTELCHUCK: So this is accepted and with that we have now completed the line for the 23rd. And it may be worth just going back for a moment and taking a look at the table that was provided to us by folks. Let's see. The comparison.

Do we have that table up? Yes.

MS. GOGLIOTTI: I have it up on my

screen. Can you see it?

MR. KATZ: Yes.

CHAIR KOTELCHUCK: Yes, we're fine. In general, in most cases, the NIOSH result is slightly higher than the SC&A result, which I find comforting because NIOSH is the one that is doing the dose reconstructions, of which we're only looking at a small percentage.

And it's good to see that NIOSH is consistently claimant-friendly. SC&A also tries to do it claimant-friendly, but SC&A is also trying to make sure it's scientifically valid and perhaps adheres somewhat more to scientific correctness, combining their original A and B perspectives. So I'm satisfied now that our results continue to be good.

Can I ask you Ted or folks, this is the 24th or --

MR. KATZ: The 23rd set. So there's a 24th set that was just delivered.

CHAIR KOTELCHUCK: Right. No, I'm thinking about the previous sets that we've looked at, from the very first sets. We had a

few, what, three from the very first set and then sets of six? How many total have we gone over since we started doing the blind reconstructions?

MS. GOGLIOTTI: I believe there are 32 in total.

CHAIR KOTELCHUCK: Very good.

MS. GOGLIOTTI: Six of those would have been from this blind.

CHAIR KOTELCHUCK: Correct, correct. Okay, fine. So it is four different sets of six and then --

MR. KATZ: Rose, does that 32 include Set 24 or not?

MS. GOGLIOTTI: I believe so. Yes.

MR. KATZ: It does include that 24. So it includes six that you haven't gone through yet, Dave.

CHAIR KOTELCHUCK: That's right. Good, that's good. So this is good.

And, Ted, I don't know, maybe it's reasonable to ask you at this time, the only one that has not been resolved is the Allied Chemical & Dye blind case from an earlier set.

MR. KATZ: Yeah, and that one, the only thing that hasn't been resolved is the surrogate data issue. And I know the SEC Issues Work Group was intending to address that at some point. I think they have been more wrapped up with the SRS coworker model issue and so they still have that on their place. They know it's there and I occasionally remind them that it's there.

CHAIR KOTELCHUCK: That's what I want to hear. That's what I want to hear.

MR. KATZ: Certainly by the time you wrap up the other six, the last six, I think we should make sure that they've wrapped that one up because that would be a good time to report out on each set.

CHAIR KOTELCHUCK: Very good. Okay. And, folks, in terms of the pace of going over the different cases versus -- and the blinds, I do find it useful that what we've done this year is every other meeting we go over three blinds. And that, by the end of the year, completes a set.

So, I would propose that we do cases, case resolution, the next time, completely, and possibly there are other things that we'll see.

And then two meetings from now, the meeting after next, we'll come back to the next three blinds. How does that sound?

MEMBER BEACH: Sounds good, Dave.

MS. GOGLIOTTI: In all honesty, I don't know that we have enough issue resolution to get through another full meeting. We only have today's matrix that we're going to cover and one more, and that's the entirety of the work that we have.

CHAIR KOTELCHUCK: Wow. You mean we're up-to-date almost?

MS. GOGLIOTTI: Almost.

CHAIR KOTELCHUCK: I'm pleasantly surprised.

MS. GOGLIOTTI: Well, we haven't done new dose reconstruction cases, non-blind cases in over three years, so.

CHAIR KOTELCHUCK: Wow. Okay. Because I'm just -- ever since I started chairing

the Committee I've just felt that we've got this load of cases, this backload that we just have to get through. But I'm glad to hear that. And so we'll see, as folks prepare for the next meeting, whether we will in fact go over a few blinds. Thank you for updating me on that.

MS. BEHLING: Dr. Kotelchuck, this is Kathy Behling. One last question on the blind comparison table that we're looking at.

Is there any benefit to the Subcommittee to add a row to each of the blinds that have been done, as we've done in the past, just summarizing what the major differences were with each of those? I don't know. We've done that in the past and I didn't know if you wanted to continue that.

CHAIR KOTELCHUCK: I don't recall right off that we've had that in the past.

MS. BEHLING: I know we did it on the 17th set and I believe we had talked about doing it on the other set. And I'm not sure we've got to that yet, but --

CHAIR KOTELCHUCK: Right, right. What

do other people think? I don't recall.

MEMBER CLAWSON: Yes, it does, because it really helps that you look at this and then just at a glance be able to understand what the difference is and why. It makes it a lot clearer for somebody to just pick it up and be able to understand.

CHAIR KOTELCHUCK: Well, that's a good, strong case for it and since I don't recall I'll go back and take a look at the old tables to see that. So we have a strong affirmation that that is worthwhile to do. Unless somebody from the Subcommittee opposes or wants to reconsider, let's just ask that you do add that column onto the table.

MS. BEHLING: Okay. And I will ensure that that also happens with the previous blind set, the 22nd set, I believe, if we haven't already done that.

CHAIR KOTELCHUCK: Sure. Good.

MS. BEHLING: Okay, thank you.

CHAIR KOTELCHUCK: Thank you. Alright.

MEMBER MUNN: Probably a wonderful simplification and it was nice to have.

MEMBER CLAWSON: Somebody's got to mark that down that me and Wanda agree on something.

CHAIR KOTELCHUCK: Right, very good. Well, I actually have a marker and you agreed once last time, last meeting. So it's getting to be a very long string at this point.

(Laughter)

Review outstanding Type 2 cases from Sets 14-18 DOE Sites matrix

CHAIR KOTELCHUCK: Right, right. All right. Now we go to some toughies, some of our outstanding type 2 cases. And apparently from Sets 14-18, item 3 on the agenda.

And I note that there's some discussion ahead for Brookhaven National Lab. So let's make the changes on the screen.

MS. GOGLIOTTI: Bob, are you on the phone?

MR. BARTON: Yes, I'm here, Rose.

MS. GOGLIOTTI: Okay. I've got your

response pulled up, the extended response, from the BRS.

MR. BARTON: Okay, great. I can see that and I can pick it up from here. If the proper folks at NIOSH are present and ready to go, I'll begin.

CHAIR KOTELCHUCK: Okay.

MR. SIEBERT: This is Scott. I'm going to tell you right now, I mean, we can go over it. However, this is a complicated issue and we will need to issue a written response. So there's really not going to be much discussion today, as far as I know.

CHAIR KOTELCHUCK: Good. That is --

(Simultaneous speaking)

MR. KATZ: Bob, can you introduce the case properly though so that people on the front end know what we're talking about?

MR. BARTON: Sure. Without obviously trying to get into too much detail, this is a BNL case and the worker was employed there for a little under two years, and was in a position and has a particular illness in which non-penetrating

or beta dose is of concern.

And unique to BNL, when we looked at this case, we looked at the dose record for this individual and we saw information about the gamma dose and about the neutron dose. And we saw nothing about non-penetrating or beta. So, we're kind of scratching our head. We didn't initially know even if the claimant was monitored for non-penetrating radiation.

When we looked at the actual dose reconstruction, we did see that there was some limited missed shallow doses applied.

When I say limited, it was actually assumed to be one-half of one dosimetry badge cycle. So, essentially, that's one quarter of the MDA being assigned as beta. And so that got us, obviously, scratching our heads a little bit.

In one of its earliest responses, NIOSH clarified that at BNL it's kind of unique in that beta doses aren't listed in the record unless they are essentially positive.

And, Scott, please stop me if I'm getting any of these technical details wrong.

So, essentially what that means is, and as you can see for those of you who are on Skype, this individual has a table with their external doses and there are columns for gamma and the neutron, and then there's nothing after the table to indicate that a positive beta dose was accrued.

Now, this person, there's no reason to believe they weren't actually monitored via the standard beta gamma dosimeter. So what that leaves us with is they were monitored but there was no positive dose for beta recorded.

So, really, the only appropriate thing to do is then evaluate your missed dose, missed shallow dose. So we looked into that. And again, as I said, the original dose reconstruction had assigned one-half of one badging cycle for this individual. And we got into that calculation, and NIOSH provided Excel files and additional clarification via written response, which is in the BRS.

And what we found, or what we think we found, is that when they went in to calculate the

missed dose -- because, again, there was nothing measured so the only appropriate thing to do was assign missed dose -- it appeared when they were calculating the number of missed zeroes they were assuming that there actually was a positively accrued beta dose.

So, on one hand, we're not assigning any measured beta dose because it doesn't appear in the record, which we feel is appropriate. But then it appears that, when calculating the missed dose, the assumption is made that there was positively accrued dose.

So that's it in a nutshell. What we did in our most recent response is we provided dose records just so you can see what we're talking about. And also we provided what we feel is a sample calculation on how that missed shallow dose should be calculated for this individual, assuming that there were no measured positive doses.

And, again, no positive measured doses were assigned, so if you're going to calculate the missed zeroes, the assumption that there was

no measured dose has to be consistent.

That's where we're at, and it sounds like NIOSH is still working on that.

CHAIR KOTELCHUCK: Right.

MR. SIEBERT: I can tell you it appears that the issue is going to be in definitions rather than a "positive" shallow dose. It has more to do with a detectable and non-detectable open window dose. And missed dose is when you can't detect something, not when there's not something positive.

So, like I said, we'll write up what we've got and we'll get it over to you guys and we can continue the exciting discussion on this.

CHAIR KOTELCHUCK: Okay, very good. Very good. So that's BNL 436.2, for those who are looking at the BRS. Good.

Now, do we have other ones of the toughies from 14 to 18 that SC&A and NIOSH would like to discuss or are ready to discuss?

MS. GOGLIOTTI: Dave, we left those off of the agenda because we thought that we wouldn't have time. We can certainly go back if

that's what you'd like to do, but I'm not sure that all the responses are --

CHAIR KOTELCHUCK: No, they're all category 2 cases and difficult ones. So I don't want to -- I didn't realize you left -- you mentioned -- and we talked about the Brookhaven National Lab case. So, I'm not surprised, then. I don't want to rush things by going back.

So, we should -- that's the single one that we thought we might be able to deal with this time and we're just not ready to complete the discussion. So let's just go onto item 4.

MR. CALHOUN: This is Grady. Can I interject something here real quick in between?

CHAIR KOTELCHUCK: Of course.

MR. CALHOUN: I should have done this a few minutes ago. But it would really be helpful for us, for the next set of blinds, that we get the supporting files, like the IREP sheets. That really helps us. So, the next time you submit those blinds, your next set, just make sure that we get those.

MS. GOGLIOTTI: I believe they were

provided. I think maybe Beth requested them.

MR. CALHOUN: Yeah, I don't know if we got them or not. If we did I didn't get them, but we'll check.

MS. GOGLIOTTI: We definitely provided them. They're on the O: drive.

MR. CALHOUN: Okay, great. Thank you.

CHAIR KOTELCHUCK: Good.

MR. KATZ: Before we move on, Dave, can I just get clarification. I'm not sure if I'm getting it from Grady or Rose, but for these difficult cases that we're just passing on now, most of them there's not a response ready so they're not ready to be discussed.

But will all of those be ready to discuss, that aren't in a Work Group outside of the Subcommittee, will they all be ready for the next meeting, say, a couple of months from now? Is that a good assumption?

MS. GOGLIOTTI: I don't see any reason why not.

MR. KATZ: Okay.

MS. GOGLIOTTI: There are responses

for some of them, but not all of them. And because it's not on the agenda I did not focus on them.

CHAIR KOTELCHUCK: Okay. And I must say, as the Subcommittee Chair and Member, I'm always happy to do the Type 1 cases. The type 2 cases are tough, but that's what we're here for as well.

MS. GOGLIOTTI: I actually did have a single one that I did want to go over if there was time.

CHAIR KOTELCHUCK: Among the 14 through 18 sets?

MS. GOGLIOTTI: It was in the 19 to 21st set, I believe.

CHAIR KOTELCHUCK: And it was one we discussed last time? If folks are ready, I'm not sure which one that is.

MS. GOGLIOTTI: I believe that was 480. The response came in yesterday night and we were a little confused by it. And so I was hoping we could go back and discuss it briefly.

CHAIR KOTELCHUCK: Okay. Although are

you sure it is not a discussion that you just want to have with the NIOSH people? A clarification.

MS. GOGLIOTTI: We can certainly hold it off. We were just a little confused. We got a response back and it didn't seem to line up with our expectations.

CHAIR KOTELCHUCK: Subcommittee Members, should we go ahead with it?

MR. KATZ: Dave, I would just let them handle that offline and get that ready, because we have to address a whole bunch of other cases at the next meeting anyway.

CHAIR KOTELCHUCK: That would be my thought as well. That's why I was thinking we wouldn't.

MS. GOGLIOTTI: Okay, absolutely.

CHAIR KOTELCHUCK: Okay. So you'll talk offline.

By the way, in thinking about the blind cases, I'm going to take the liberty of the Chair to just go back for a comment about the blind cases that I meant to make.

Generally, in the past, as we've gone through blinds, sometimes persons in the cases that we're looking at have most unusual cancers. And usually we try to avoid mentioning them because we don't violate a person's privacy. And if it's a rare cancer, by talking about the type of cancer, we in fact may reveal personal information, which we do not want to do.

My comment is, as we've gone through this set, we also are coming across cases where people work at many different sites. And when a person has worked at several sites, at a certain point, it seems to me, by mentioning the sites we implicitly may be revealing personal information that people can realize who that might be.

And I know we don't want to do it, nor am I criticizing. In fact, I didn't think about that until today's discussion. But if I may just put a word in for the future that as we discuss blinds we also look at not just the type of cancer but the work at different sites, different facilities. And if we have some that are unusual that may reveal personal things that we try to

just say "this is a facility," or "the person worked at one facility for a short time here" and not mention the facility.

We can't be perfect and there's no absolute protection for privacy, but I just thought I'd mention it. It did come up as I was looking at some of the cases in this last set.

MR. KATZ: That's a good mention, Dave, because I had that exact same thought and it was too late, it already had been done. And it's nothing -- I don't think we have any public even on the line today. But it is a good idea to just, when we have a complex work history, let's not lay it all out in exact detail.

CHAIR KOTELCHUCK: Right. Okay. Fine. Yeah, I did not think about that until today's discussion. But it's just a word of advice and caution and no criticism of anybody. We work collectively in trying to do the right thing.

MEMBER MUNN: There is another aspect to that, though, that is one has to not forget. And the other aspect is in an attempt to try to

do the right thing we can do so many right things that we can't really and truly do the larger right thing.

That's a kind of situation that one runs into in safety considerations of all kinds, especially in the nuclear world. You can attempt to be so safe that you cannot operate anything.

CHAIR KOTELCHUCK: Yes.

MEMBER MUNN: And if we are going to be completely clear in our understanding of the exposures that people have, we need to have more than a passing understanding of the fact that they were just in a facility.

MR. KATZ: Right. But, Wanda, I totally agree, but, I mean, you're getting this material in writing and so the person leading the presentation can say "the first facility, the second facility," instead of saying Hanford and Iowa or whatever it is.

And that then still shields the public and you have all the information you need in the precise detail.

But, really, violating the Privacy Act

is a most serious problem, and so that really takes precedence over the clarity of conversation, I would say, if you had to choose between the two.

CHAIR KOTELCHUCK: Well, there's a balance to be had because complete personal protection is not available, but we'll do our best.

MS. GOGLIOTTI: How about whenever the person worked at two or more sites we'll say the main site and then the other site we'll just --

MR. KATZ: Yeah, yes, that's what I was saying. That works fine. You don't have to specify the rest of the sites, right.

Review Type 1 cases from Sets 19-21

CHAIR KOTELCHUCK: Okay. Good. Now let's go on. It's 2:45. We could take a 15-minute break now. Although, frankly, we've only been going for about an hour, so I would hold off. I'd start with the Type 1 cases and we'll go on until 3 o'clock, let's say, or a little after 3, and we'll take a short break.

MEMBER MUNN: Fine.

CHAIR KOTELCHUCK: Okay. Alright. So, let's go to item 4, sets 19 through 21.

MS. GOGLIOTTI: These are just the Type 1s.

CHAIR KOTELCHUCK: Yes.

MS. GOGLIOTTI: And I have here pulled up our Type 1 spreadsheet, and I'll just go through it, if that's okay with everyone.

CHAIR KOTELCHUCK: Very good.

MS. GOGLIOTTI: Alright. The first observation is 453, Observation 1. And this is an Iowa Ordnance Plant, Sandia, Albuquerque, Pacific Proving Grounds, and NTS case.

And our observation was simply that we thought the wrong revision of the TBD was cited. It appeared to us that they had used the correct version of the TBD because some of the things that were included in the dose reconstruction, but the wrong revision was cited.

And NIOSH does agree that the wrong revision was cited, but they used the correct revision when actually completing the dose reconstruction.

CHAIR KOTELCHUCK: Okay. So, any comments?

MEMBER MUNN: I like those.

CHAIR KOTELCHUCK: Yes, I do too. Alright. Then that sounds good. Closed.

MS. GOGLIOTTI: Alright, next is from the same case, Finding 1. And the finding states that NIOSH failed to properly account for the recorded dose to the prostate.

And this, I believe, was more of a misunderstanding. The dose reconstruction text said that they used a dose correction factor of greater than 1 for the prostate, which using a dose correction factor of 1 would be incorrect because the dose correction factor for the prostate is 1.244, I believe.

And NIOSH just provided us with additional clarification that maybe we were misinterpreting the text and the dose reconstruction. So I believe we can close that.

CHAIR KOTELCHUCK: Okay. Alright.

MR. CALHOUN: Is that still a finding?

CHAIR KOTELCHUCK: That's a good

point.

MS. GOGLIOTTI: Based on the clarification, and since I don't believe you actually did anything wrong other than the incorrect text, I would say that it's an observation.

CHAIR KOTELCHUCK: I think you're right. Okay. So, change that to an observation. 453.2.

MS. GOGLIOTTI: Yes. This one stated that NIOSH failed to apply a dosimeter uncertainty factor. And NIOSH did agree with this finding. When they applied the factor it did decrease the PoC from around 40 to about 37 percent, and so that didn't impact compensation. So, based on that, I recommend closure.

CHAIR KOTELCHUCK: Well, that does sound like a finding. It happens to reduce the PoC but that's not of consequence. The consequence is that it changes the PoC. And NIOSH agrees. So I think we should move to close it.

Again, if any Subcommittee Member has concerns or comments or objections, of course.

MEMBER BEACH: Agreed.

CHAIR KOTELCHUCK: Okay. Done. Closed.

MS. GOGLIOTTI: Okay. The next one is a Pantex plant case, and that is 461.2. And the finding states that NIOSH did not apply a clothing electron attenuation factor for the forearm and elbow. I believe there were two skin cancers in this particular case. Generally, when the skin is covered by clothing we would apply a correction factor for an electron dose.

NIOSH agrees that they probably should have assigned long sleeves for those particular cancers. In this case it actually did reduce the PoC and it would reduce it from just over 50 percent to 49.8.

CHAIR KOTELCHUCK: Right. Was this compensated?

MS. GOGLIOTTI: Yes.

CHAIR KOTELCHUCK: Yeah, as I thought. Alright.

MS. GOGLIOTTI: And we're not going to go back and take away compensation from --

CHAIR KOTELCHUCK: Oh, no, absolutely, that's a standing rule. But nor is it obvious whether the person in a plant, in the American South, and I don't know which times of year, whether the person in fact wore clothing.

MS. GOGLIOTTI: I believe this person wore coveralls as a part of their job, which in general would cover your arms.

CHAIR KOTELCHUCK: Yes. True. Well, that's good, then, that we know that. So probably it would have been 49.8.

But, again, I think we should close it because this is a finding and we agree and the issue about whether it flips it or not is not, again, of consequence in this aspect of the examination.

So, move that we close. Any comments or disagreements?

MEMBER BEACH: Agreed.

CHAIR KOTELCHUCK: Okay.

MS. GOGLIOTTI: Okay. I cannot explain why that one was just randomly thrown in here, but the next one we're actually going to go

back to the previous case.

CHAIR KOTELCHUCK: Okay.

MS. GOGLIOTTI: I apologize. I don't know how that happened here. Which is Iowa Ordnance, Sandia, PPG, and NTS. And it's Finding 3. And the finding states that there was potential improper accounting of recorded photon dose for the year 1972.

And what happened here, it was kind of unusual. In the dose reconstruction report there were several different computer-generated values reporting this EE's dose. One reported the higher dose than the other. And so our initial thought was always to go with the higher dose.

But this is actually an electronic reporting system and what they were doing is they were rounding the values prematurely before they were adding them together, which results in an inflated dose. And so NIOSH actually did use the correct value, it's just this reporting system, for whatever reason, rounded too early in the process.

CHAIR KOTELCHUCK: Yeah. Well, it

certainly is incorrect in procedure but how do you know that the result was higher rather than lower?

MS. GOGLIOTTI: Well, in this particular case, because we had multiple results. And the lower results, when we went back and looked at them, we could see why they rounded up and how that --

CHAIR KOTELCHUCK: Okay. So you saw the exact as well --

MS. GOGLIOTTI: Yes. That wasn't immediately apparent to us when we were doing our dose reconstruction. I'm not sure why they would have done that, but that's what happened.

CHAIR KOTELCHUCK: Right. In a sense it's a kind of a QA, although it was not for an individual doing the dose -- it wasn't a reconstructor, it was some sort of electronic system. Nevertheless, it wasn't a question of NIOSH doing anything wrong.

MS. GOGLIOTTI: No, I don't believe that they did anything wrong. And they did follow the correct -- we had just simply never seen this.

And I believe there was another finding that's identical to this one further down that we'll run into, for the same reason.

CHAIR KOTELCHUCK: Okay. To my mind, this is an observation with a QA. Wouldn't that be --

MR. KATZ: Yes, it's an observation. The QA doesn't relate to the program. It's not QA in our context because it's not our folks making a QA error.

CHAIR KOTELCHUCK: Right. So, from our point of view, it's just simply -- there was no error made by NIOSH. Therefore it's an observation.

Okay, let's close this as an observation. Again, awaiting comments or concerns from our other Subcommittee Members.

Okay. Let's go on.

MS. GOGLIOTTI: Okay. From the same case, Finding No. 4. And the finding states that uncertainty factor was not applied as stated in the dose reconstruction report. And here NIOSH agreed with us. It wasn't as stated. The DR

report is correct. And 1.3 should have been applied.

However, in this case uncertainty was inadvertently not selected in the workbook and so it was not actually included in the dose reconstruction report.

CHAIR KOTELCHUCK: I'm reading it again a little bit. I'm not quite sure.

MS. GOGLIOTTI: So in the report they stated that they used the dose reconstruction uncertainty factor of 1.3 and it should have been applied.

However, when they went to actually apply it the checkbox didn't get selected in the workbook that calculates this.

CHAIR KOTELCHUCK: Aha.

MR. KATZ: So that's a QA.

CHAIR KOTELCHUCK: Yes. Okay. Right, right. And that's an observation again.

MR. KATZ: Why is that an observation? That's a mistake. That's a finding.

It's a finding because the factor wasn't applied and it should have been. Right?

Did I misunderstand?

MS. GOGLIOTTI: That's correct.

MR. KATZ: Yes.

CHAIR KOTELCHUCK: Okay. All right. I see. All right. Let's go on.

MS. GOGLIOTTI: Okay. Same case, finding number 5. And the finding states that NIOSH assigned a duplicate record for the year 1976.

This was kind of one of those cases where the EE worked at a lot of different sites.

And here the same results appeared in two site's records. They had the same dates.

And so when SC&A saw that we interpreted that to mean that they were the same record and the main site that the EE worked in was simply reporting the site from the off site that they had visited.

NIOSH in all likelihood agrees with us but they weren't 100 percent sure so they assigned it anyway which would be an additional approximately 30 millirem assigned to each of the doses.

Not a big difference. Doesn't affect the PoC at all. It's a different interpretation of the duplicate record.

CHAIR KOTELCHUCK: Just reading. I'm not sure what --

MS. GOGLIOTTI: This is a difference in judgment.

CHAIR KOTELCHUCK: Pardon?

MS. GOGLIOTTI: I guess you would say this is a difference in judgment.

MR. CALHOUN: Here it is Dave. Let me try to help.

Okay, yes, we've got two sets of dosimetry reports, one from Sandia and one from NTS.

Both of them had this dose recorded for this year, two separate dosimetry reports. Because the EE was probably sent to one facility from the other.

But there was no delineation as to where the dose came from. And it was on two separate reports.

So per our standard claimant-

favorable approach when we don't know we have to choose the approach that's claimant-favorable.

Therefore we assumed it happened at both sites and not just one.

CHAIR KOTELCHUCK: Very good. Okay.

MR. CALHOUN: I would also say that this probably goes down to an observation too.

CHAIR KOTELCHUCK: Yes, sounds like it. And thank you for that. That is clarifying. Yes, makes sense.

Okay, that being the case we should close it as an observation. Unless, do hear any concerns? No? Okay, so it is closed. Let's go on.

MS. GOGLIOTTI: Okay. The next one is 453.7. Same case. The finding states that there was a potential improper accounting of recorded electron dose for the year 1972.

And this is going back to the same thing that we identified earlier with the electronic records that rounded prematurely.

CHAIR KOTELCHUCK: Right. Okay. So again that's now again an observation.

And we accept? Sounds like it. Okay. So we'll close it.

MS. GOGLIOTTI: Okay. Same case, finding number 8 states that there was a failure to account for missed -- I'm sorry, did someone say something?

Okay. There was a failure to account for all missed photon dose cycles while employed at Sandia.

And NIOSH agrees here. The 1965 and '66 were not included in the IREP evaluations. They said it was just inadvertently left out by the dose reconstructor.

CHAIR KOTELCHUCK: Right. Okay. So that would be a finding. And we should close it. You're in agreement? Okay, closed. Next.

MS. GOGLIOTTI: The next one, same case again. It states that SC&A was unable to reproduce the assigned occupational medical doses.

And NIOSH agrees. They were also unable to account for the assigned dose of 5 millirem X-ray dose.

At the time I guess there was no site-specific tool for SNL. It was likely a transcription error.

CHAIR KOTELCHUCK: All right. Another finding. And there is agreement with the two groups. So, shall we close it folks?

MEMBER MUNN: Yes.

CHAIR KOTELCHUCK: Right. If we don't -- I'm trying to remember. We don't have too many more at this point, do we?

MS. GOGLIOTTI: There might be 15 to 20 more.

CHAIR KOTELCHUCK: Pardon?

MS. GOGLIOTTI: I would guess maybe 15 to 20 more to go through.

CHAIR KOTELCHUCK: Fine, okay. Well, in this case maybe we should take a break. It is 3 o'clock. I suggest we take a rest break. It's 3, 3:02, so let's get back together at 3:15, 3:17 if you want to be precise, 3:17.

And we'll go on and finish up and then we'll be finished for the day I believe.

MR. KATZ: Sounds good.

CHAIR KOTELCHUCK: Okay. See you all in 15 minutes. Bye bye.

(Whereupon, the above-entitled matter went off the record at 3:03 p.m. and resumed at 3:19 p.m.)

MR. KATZ: You have a quorum.

CHAIR KOTELCHUCK: Very good. Let us proceed.

MS. GOGLIOTTI: Okay. Where we left off here, this is a Los Alamos case, tab 454, finding number 1.

And the finding states that NIOSH did not assign unmonitored LANL neutron dose for the year 1946. And NIOSH agrees that that should have been assigned.

When they did go through and assign it the combined PoC went up approximately 4 percent. But not enough to affect compensation.

CHAIR KOTELCHUCK: Okay. All right. That's a clear finding. And we will close that unless I hear objections.

MEMBER CLAWSON: I'd say go ahead.

CHAIR KOTELCHUCK: Is that Brad?

MEMBER CLAWSON: Yes, I'm here.

CHAIR KOTELCHUCK: Good, okay.

MEMBER CLAWSON: I was talking on mute for a little while.

CHAIR KOTELCHUCK: You sound funny. I can't hear quite why, but others can. Anyhow let's go on to the next observation.

MS. GOGLIOTTI: Okay. This is also a LANL case. This is 486, observation 1.

And this observation stated that the IMBA file was missing from the DR report. SC&A was still able to go through and confirm the dose reconstruction on this file. We decided to recreate it but typically it would be a file included with the DR files.

NIOSH agreed with us. The file was missing. We did confirm that.

CHAIR KOTELCHUCK: Okay. That's right, observation, okay. All right. We step back. We don't close it. We accept and let's go on.

MS. GOGLIOTTI: Okay. Same case, 486.1. The finding states that three additional

scans were not assigned in the medical dose.

NIOSH agreed with this finding. There was a PSG scan that should have been included for 54, 55 and 56 based on X-ray records.

CHAIR KOTELCHUCK: Okay, fine. Clear finding. Okay, so that should be closed.

MS. GOGLIOTTI: Yes. It didn't have a strong impact on PoC.

CHAIR KOTELCHUCK: No.

MS. GOGLIOTTI: Okay. The next one is --

CHAIR KOTELCHUCK: Sandia.

MS. GOGLIOTTI: Sandia, Albuquerque and also LANL. This is tab 464, observation 1.

And the observation states that the DR report incorrectly states that each X-ray examination was assigned a PA and a lat view when in reality only a PA was assigned. Only a PA would be the correct thing to do but the text was not in the actual DR report.

CHAIR KOTELCHUCK: Okay, absolutely. Clear observation. Accepted. Again always pending concerns which I hear none. Let's go on.

MS. GOGLIOTTI: Okay. The next one is an NTS, Amchitka Island, Rocky Flats and Pantex. And this is tab 489, observation 1.

And this observation had to do with the reported site visits in the EE's CATI. They were very, very adamant that they had visited a number of sites that were not included in the DR report.

They said that they worked for a different contractor that wasn't included. But NIOSH didn't really have enough evidence or the files weren't available at the time. And so those were not included in the report.

But we thought that a mention of them would have been the appropriate thing, that the EE said that in the CATI report and they couldn't include them for documentation reasons.

And NIOSH agreed with that.

CHAIR KOTELCHUCK: Yes. And I guess that would be an observation. Right. NIOSH did not get a report that would have allowed them to put it in, right? Okay. Accepted.

MS. GOGLIOTTI: Okay. The next one is

from the same case, finding number 1.

Failure to assign missed dose. And NIOSH agreed with this finding also.

When we reevaluated the dose the PoC actually went down from 40 to 38. And they attributed the decrease to fluctuations in Monte Carlo.

CHAIR KOTELCHUCK: Right, okay. Okay. That sounds okay. So, that's an observation.

MS. GOGLIOTTI: No, that's a finding.

CHAIR KOTELCHUCK: I mean a finding. I meant a finding and I said observation.

MS. GOGLIOTTI: It's all right.

CHAIR KOTELCHUCK: Thank you. This is a finding and we accept.

MS. GOGLIOTTI: Okay. The next one is from Pantex and it is tab 461, observation 1.

And the observation states that there may have been additional X-ray exams performed during the second employment period.

With this particular individual there was a termination scan and then they started employment again and there were no X-rays

included in that record for the second employment period.

NIOSH states in looking back and said that they did have several results that were not eligible to be included. Injury-related X-rays are not included in dose reconstructions.

CHAIR KOTELCHUCK: Correct.

MS. GOGLIOTTI: And they believed that they had all the records.

We weren't entirely convinced with that argument because after the dose reconstruction was completed at least five more records of X-rays were added to the EE's files.

And so we don't really agree with the argument that they were all available in the EE files and we think that the default frequency would have been appropriate for this particular individual.

MR. SIEBERT: This is Scott. Let me address that one.

The five additional records are film and TLD badge information. They don't have anything to do with medical records if I recall

correctly.

MS. GOGLIOTTI: I don't remember the exact -- what records were added. However, I think that it speaks to the fact that the EE's files were not complete.

But in this case it was compensated so it's not really an issue.

MR. CALHOUN: This is Grady and I just wanted to throw in it should be noted that anytime we get any documents that are associated with a claimant file from any source after the DR is done we review those files and we determine if they were present before the dose reconstruction or after the dose reconstruction was completed.

If they are important and are new documents we will revise the dose reconstruction. We'll actually redo the calculations and if a compensation decision changes we'll actually recall and reopen the case from the Department of Labor and revise the dose reconstruction and send it on.

Just so you know there is a system in place to deal with additional data that's found

after a dose reconstruction is completed.

MS. GOGLIOTTI: Absolutely, and I know that that has happened.

CHAIR KOTELCHUCK: Right.

MS. GOGLIOTTI: In this case just the EE reported having annual scans. They were employed for a very long period of time. I feel like you would remember getting an annual scan but that was not taken into account for the second employment period.

It didn't impact anything in this particular case, but it's an observation. We brought it up.

CHAIR KOTELCHUCK: It was an observation because it was something incorrect that was done. New records came in later.

Okay. Move to close this one. We don't have to close it. We recognize it, right? You don't close an observation. Or do we?

MS. GOGLIOTTI: Typically we close observations.

CHAIR KOTELCHUCK: Okay. Then we so close it. All right. And the next observation?

MS. GOGLIOTTI: Okay. This is a Pantex from the same case, observation 2.

It states that Table 5-6 of the TBD-6 does not state the units of intake. SC&A assumed one and we picked the correct one. The setting was wrong. It's being updated in the new revision.

CHAIR KOTELCHUCK: Good, good. Okay. And we should accept this and close it. All right.

Let's go on now to the first finding. Pantex.

MS. GOGLIOTTI: Okay.

CHAIR KOTELCHUCK: 469 number 1, right?

MS. GOGLIOTTI: Yes. States that NIOSH incorrectly interpreted the application as skin dose from TBD-6.

NIOSH said that basically they updated the TBD since OTIB-6 and the DR guidance to clarify how a monitored electron dose should have been assigned. And the dose that was assigned in this case was claimant-favorable.

CHAIR KOTELCHUCK: Right.

MS. GOGLIOTTI: The guidance has been updated. What they did was claimant-favorable.

CHAIR KOTELCHUCK: But they updated it to correct -- to make a corrected assessment. So it would be an observation. Excuse me, a finding. It was a finding.

Since I haven't called upon the other Subcommittee Members you're all there and in agreement I hope that we close this?

MEMBER BEACH: Yes, Dave.

CHAIR KOTELCHUCK: Okay. All right. Didn't want you to think this was a one-person show, that's all. Okay.

MEMBER POSTON: Like the little boy said that never spoke till he was seven years old he said up till now everything has been okay.

(Laughter)

CHAIR KOTELCHUCK: Okay, very good. All right. Let's go on to finding 3.

MS. GOGLIOTTI: And this states that NIOSH used the incorrect MDL value for the years 1973 and '74.

I believe this is a TBD table issue. The TBD has since been revised and then modified the guidance so this issue kind of went away.

If they followed the current guidance it would reduce missed dose substantially. Therefore we recommend this issue.

CHAIR KOTELCHUCK: But was anything done incorrectly initially? It doesn't seem that way.

MS. GOGLIOTTI: I think that there was a discrepancy in the TBD as to what should have been done. And one table said one thing, and another table said something different.

I could go back to the actual BRS if you wanted the more complete answer.

CHAIR KOTELCHUCK: No, the question is what do the NIOSH colleagues say.

MR. SIEBERT: We do maintain that we did it correctly.

CHAIR KOTELCHUCK: Yes, I thought you might.

MR. SIEBERT: But I agree there was an inconsistency in the TBD and we did rectify that.

But we did the claim correctly.

So I would have the tendency to say it's an observation, but that's just me.

CHAIR KOTELCHUCK: Right. And that partially is why I'm asking because in fact there were different interpretations available to you from the TBDs that existed, from the tables that existed, right?

I don't know quite what to say. Other folks? Here's a case where it was interpreted -- there were contradictions within the materials from which they were drawing. And they drew one and it curved on the other. And it's been taken care of.

MR. SIEBERT: Let me just clarify one thing. Part of our response is yes, the two tables were in disagreement, but there's a section of the TBD that very clearly states which table to use for the calculation of missed dose and that is what we followed.

CHAIR KOTELCHUCK: Aha. SC&A that makes a case.

MS. BEHLING: This is Kathy. There

was still a discrepancy and an error in the TBD. So shouldn't that have been pointed out.

MR. KATZ: Well, it should be pointed out, Kathy, it's just a question of whether this is an observation. If the case is done correctly then it's an observation.

And it is a useful correction or finding in terms of the document, that we record the observations when they don't affect the case.

MEMBER MUNN: This is a case where the fault is in the stars and not in the individual.

CHAIR KOTELCHUCK: Nice. Right.

MEMBER MUNN: If that's the case then this should be an observation.

CHAIR KOTELCHUCK: I think that's -- the stars would be an observation. And I would agree. So let's close this as an observation.

MS. GOGLIOTTI: Okay, but just to clarify, this is something that you were happy that we made this --

CHAIR KOTELCHUCK: Yes. Let me say this. Let it be clear that when you folks observe and something is accepted as an observation it is

appreciated at least by this Subcommittee member and I suspect by others as well.

Just because it's an observation and not a finding, all of them are welcome and all of them play a role, seriously. I mean, I'm not trying to be nice. It is useful as an observation and it is appreciated that you found it.

MEMBER MUNN: It's also especially useful because it pointed out an error, not an error the way that the calculation was made. That's the whole point. We got to the error through this observation and that's helpful.

CHAIR KOTELCHUCK: Yes, that's right. Our procedures were improved as a result of this observation.

MEMBER CLAWSON: That's the bottom line is it's correcting our process. Beyond popular belief we don't like findings and observations, are wonderful because bottom line they're just to make the process better and more clear.

CHAIR KOTELCHUCK: Agreed. All right. Closed and we move on.

MS. GOGLIOTTI: Okay, great. And the next one here is going to be from the same case.

CHAIR KOTELCHUCK: Right. Finding 4.

MS. GOGLIOTTI: And this one states that NIOSH assigned neutron dose for the years 1962 to '64.

NIOSH agrees with us that the TBD was unclear and that the neutron dose has been favorable in this particular case.

The latest revision is revised to include neutron dose starting in 1960 for unmonitored workers. So apparently the older revision did not allow that.

In this case the PoC is also over 50 percent.

CHAIR KOTELCHUCK: But that I think identifies an observation. It was unclear, revisions were made as a result to clarify, but it was not --

MS. GOGLIOTTI: What was done was claimant-favorable. In the current sense this case probably would not have been compensated based on where the PoC is if it was done today.

CHAIR KOTELCHUCK: Yes. So anyway, let's close it as an observation.

MEMBER CLAWSON: Well, while we're speaking about observations, Dave, I'd like to make the comment that I've never heard so many fire engines or ambulances in my life than when you're on the phone.

CHAIR KOTELCHUCK: By the way, I -- this was terrible. You folks don't know, but I had some persons going out with a jackhammer in the middle of the afternoon. I closed the window. I'm hot. Not bothered. But that is the way of life and I always wonder how much you folks hear through our windows.

MEMBER CLAWSON: Everything.

CHAIR KOTELCHUCK: Okay, very good, very good. Did you notice that my wife walked in in the middle of this? No.

(Laughter)

CHAIR KOTELCHUCK: Okay. I can't do much about that.

MEMBER CLAWSON: I'm just teasing you.

CHAIR KOTELCHUCK: I know, I know.

Anyhow, let's go on.

MS. GOGLIOTTI: Okay.

CHAIR KOTELCHUCK: Pardon?

MEMBER MUNN: I said you live in Manhattan and that's why Brad doesn't.

CHAIR KOTELCHUCK: That's right, that's right.

MEMBER CLAWSON: Yes, that's a good point.

CHAIR KOTELCHUCK: All right.

MS. GOGLIOTTI: Okay, the next one is also a Pantex case, tab 462, observation 1.

CHAIR KOTELCHUCK: My goodness, Weibull again.

MS. GOGLIOTTI: The Weibull distribution. With this particular case we assigned it for every single one based on Dr. Melius's recommendation. So here's Weibull again.

CHAIR KOTELCHUCK: Very good. And agreed that it's an observation.

MS. GOGLIOTTI: Okay.

CHAIR KOTELCHUCK: Very good. We

close.

MS. GOGLIOTTI: And the next one here, 462.1 from the same case. It states that NIOSH did not factor in the fraction of the year that was unmonitored during 1982.

NIOSH agrees. For the year '82 unmonitored external dose was applied for the full year for skin even though the claimant was monitored only for eight months out of the year.

The unmonitored dose was prorated in the year '82. All other years the partial monitoring was properly prorated for both organs.

So in this case one organ was not prorated and the other one was. It resulted in slightly excess dose to both cancers. It didn't affect compensation.

CHAIR KOTELCHUCK: Right. Okay. Well, that's a clear case of an error. So that's finding 462.1 and we should close that unless I hear objections. And what seems to be the last one on our last. Weldon Spring.

MS. GOGLIOTTI: Weldon Spring. Tab 469.1. And this shows that there was

inconsistency in missed and unmonitored dose assignments.

And NIOSH did provide us with an explanation for how they assigned dose for the three years in question.

We agree that a finding of full year of ambient dose was claimant-favorable. However, we question it because it was assigned during the start of employment which was 1959 and you're not technically supposed to apply dose prior to employment. And finding a year of ambient dose would do that.

But ultimately it doesn't impact compensation.

CHAIR KOTELCHUCK: Well, but it went in with the spirit of claimant favorability. In that sense it was not -- it was not missed. It's simply for a case that we were looking for -- we're looking at the maximum PoC that might be assigned.

So I would tend to feel that this was an observation. I don't know how others feel.

MR. CALHOUN: This is Grady. I agree

with that because if it was a comp case we wouldn't have done that.

CHAIR KOTELCHUCK: Yes.

MR. CALHOUN: This must be an older case. It's probably not a best estimate at only 40 percent.

CHAIR KOTELCHUCK: Yes, yes, I agree. So I'd like to close this as an observation.

MS. GOGLIOTTI: Okay.

CHAIR KOTELCHUCK: And there we are.

Review Type 2 Cases

MS. GOGLIOTTI: So that was all the type 1 findings in this matrix. There are a handful of type 2 findings that we could go through if you wanted to.

CHAIR KOTELCHUCK: Pardon?

MS. GOGLIOTTI: There are a handful of type 2 findings. I'm not sure that we'll get any resolution on those today though.

CHAIR KOTELCHUCK: Well, I would say at 3:40 I would be open to discussing a couple of these type 2 cases and get the discussion going and getting us thinking about it.

No more than half an hour to an hour. What do my colleagues, particularly my Subcommittee colleagues think? Although in this case staff as well.

Would folks be willing to go ahead with a couple of type 2?

MEMBER CLAWSON: Yes.

MEMBER POSTON: Yes.

CHAIR KOTELCHUCK: Then let's do it. All right, excellent.

MS. GOGLIOTTI: Okay, we're going to go back to 453.6 which was the Iowa Ordnance Plant, Sandia, PPG, and NTS.

And this finding had to do with improper method used for calculating shallow dose.

And here there appears to be some kind of disagreement. Actually I should switch to the BRS. I'm sorry. One second. Let me just get that pulled up.

I summarized them in there. NIOSH probably wants to use their real text.

MEMBER BEACH: -- are you going to go

to?

CHAIR KOTELCHUCK: Pardon?

MEMBER BEACH: I was asking what number that we're going to. In the BRS.

MS. GOGLIOTTI: 453.6.

MEMBER BEACH: Thank you.

CHAIR KOTELCHUCK: All right.

MS. GOGLIOTTI: And the next one will be 462.2. Okay, so again the finding stated that there was an improper method used for calculating shallow dose.

And here Scott responded back that NIOSH followed the guidance in the TBD and the approved NTS document states that the beta to gamma ratio 1.04 was applied.

This ratio was based on empirical measurements. But NIOSH is going to review the guidance as it applies to this particular dose.

I'm sorry, not this particular one. And they're going to review the guidance while they're going to the next revision of the TBD.

So we recommend that we hold off on resolving this finding until that has occurred.

CHAIR KOTELCHUCK: Right. So this actually would be referred. Well, would it be referred to the PPG Working Group?

MS. GOGLIOTTI: I'm not sure they're going to need to refer to them.

MR. KATZ: There's no Working Group here.

CHAIR KOTELCHUCK: Pardon?

MR. KATZ: There's no Work Group here for this one.

CHAIR KOTELCHUCK: We don't have a Pacific Proving Grounds Work Group?

MR. KATZ: Oh, I thought you said IOP.

CHAIR KOTELCHUCK: No, no, Pacific Proving Grounds.

MEMBER MUNN: Yes, we do now.

CHAIR KOTELCHUCK: So it's in progress awaiting their response but since the person, the case involves several different facilities can we -- we can't -- well, we have to wait for PPG to come back. So it has to be in progress and referred, right?

MR. KATZ: Wait, what's going on with

PPG? You said they're changing their guidance? It doesn't necessarily need to go to the Work Group at all if this is something NIOSH is changing the guidance and then it'll be able to be resolved.

I'm unclear on what the Work Group would be doing.

MR. CALHOUN: I think once the Work Group has a discussion and the outcome of that discussion, if it affects what we've done here we'll change the TBD based on that.

I think what we're saying is we're not going to change the TBD until the discussion in that Work Group is completed.

But I kind of agree with Ted. I don't think there's a reason to refer it to the Work Group.

MR. KATZ: Moreover I think the Work Group, I mean unless I'm mistaken the Work Group reported out on the Site Profile review at the last Board meeting.

And there's one little nitty matter to resolve, but I'm sure it's not this matter. So

I don't think the Work Group has more work to do on the Site Profile.

I think this is in NIOSH's hands, DCAS hands to say when they're ready to respond to this.

MS. BEHLING: Ted, you're correct. And that beta to gamma ratio did change. And the new TBD is out for PPG and we like you said closed out all items but one I think NIOSH has to report back.

MR. KATZ: Yes. Okay. So this can go to the next meeting.

CHAIR KOTELCHUCK: Good.

MS. GOGLIOTTI: Okay. Then the next one is 462.2. And this is the Pantex case.

NIOSH used the NT value for unmonitored workers instead of monitored workers for assigned neutron dose.

And Scott, if you just want to respond. Otherwise I could read your response.

MR. SIEBERT: Sorry, I'm looking at it here. You're skipping around so I have to jump around. 462.2, right?

CHAIR KOTELCHUCK: Yes. What is the issue because it's now no longer on the screen.

MR. SIEBERT: This is the discussion of whether a clothing electron attenuation factor to the forearm and the elbow is appropriate or not.

MS. GOGLIOTTI: No, no, this is unmonitored worker.

MR. SIEBERT: Okay, let me flip again. As I said I have to jump around here.

CHAIR KOTELCHUCK: Yes, sure.

MR. SIEBERT: 462.2. Okay, I'm sorry.

CHAIR KOTELCHUCK: The NT value.

MR. SIEBERT: Well, are you going to cover the first part of it?

MS. GOGLIOTTI: I can certainly read the rest of the finding. We don't normally include the full finding text in the heading just because it interferes with printing and whatnot.

CHAIR KOTELCHUCK: Sure.

MS. GOGLIOTTI: The TBD recommends that use of an NT value of 1.7 for monitored workers and an NT value of 0.8 for unmonitored

workers.

In this case the EE was monitored during this period of dose assessment. Therefore we interpret the TBD to recommend a 1.7 should have been used. This would result in an additional 0.291 rem of dose for one organ and 0.567 for the skin cancers.

It would also have a small impact on the PoC value.

MR. SIEBERT: This is an extensive result. I have to read over it because we were doing the type 1s today and I didn't prep this one.

Okay. What it basically comes down to is about halfway down in the response that we put in on I believe 6/26. Table 6-19 does give clearer guidance. It shows that a factor of 1.7 is to be used in maximizing cases only.

And that table says when a best estimate was required as it was in this claim the table directs the DR to use Monte Carlo analysis.

When you're doing Monte Carlo analysis you use the full distribution which is the mean

value plus the distribution. So we were following the Table 6-19.

I agree there's some inconsistency in the TBD as to what it says and how that's applied.

However, in best estimate cases this is the norm that we use the actual GM with the full actual distribution in Monte Carlo calculations.

MS. GOGLIOTTI: Okay. I think that I'm going to have to review this offline. I didn't see this one posted.

MR. KATZ: That's fine, Rose. We can get this at the next meeting.

CHAIR KOTELCHUCK: Where are we in the discussion?

MR. KATZ: So, Rose is going to review this for the next meeting, the response. Because NIOSH has a response but it's recent.

CHAIR KOTELCHUCK: Okay. So that'll be in the next meeting. Okay. Well then we have two reports that we'll have next meeting for type 2.

MS. GOGLIOTTI: Oh, we have lots more

type 2.

CHAIR KOTELCHUCK: Okay.

MS. GOGLIOTTI: It looks like altogether here there's maybe about 20 type 2s that are remaining from past sets. And then we'll have all of the AWE cases next time.

CHAIR KOTELCHUCK: We are talking about in sets 19-21 are we not?

MS. GOGLIOTTI: We have been up until --

CHAIR KOTELCHUCK: Yes, sure. We had type 1 and then we're going through type 2 in those. Okay, just want to clarify.

MS. GOGLIOTTI: Yes, we have done some of those type 2s but we haven't finished those up yet.

CHAIR KOTELCHUCK: No, no, I'm fine, I'm fine. I just want to make sure that I'm understanding. The next one we want to discuss in sets 19-21 the type 2s in which file?

MS. GOGLIOTTI: For sets 19-21 we'll have to do the type 2s that are remaining from the SRS and the Oak Ridge site.

And then we also have the AWE matrix that we haven't started yet. So we need type 1s and type 2s from that matrix.

CHAIR KOTELCHUCK: All right. Good. So should we continue on?

MS. GOGLIOTTI: Those were all of the type 2 findings in that matrix, but I did pull up here 482 observation 1 which we got a response back from yesterday afternoon.

But I just want to ask NIOSH, we're going to need some more guidance on this one. This is the Hanford case. It has to do with the glove boxes adjustment factor.

And they used a factor of 2.19 as the determining and whether or not to assign glove box dose.

And we were trying to track down where this number came from. It just kind of popped up in one of the guidance documents. We've never seen it before.

It didn't make sense to us. NIOSH provided us with several templates and we're still trying to track down where this number came

from.

And we got a response yesterday that basically says that it came from a Savannah River neutron exposure. And again this is a Hanford case.

The text says essentially someone worked on the SC or AC lines at SRS. The shallow to deep dose ratio was greater than 2.

And it seems like you guys are hanging your hat on that.

MR. SMITH: This is Matthew Smith with ORAU team. As mentioned at the previous meetings that particular OCAS at the time was early on in the project.

And certainly the guidance there, although the TIB is aimed at neutron exposure, that guidance was in the document as helpful for identifying when people are working in a glove box environment.

So yes, I mean that very early guidance is in something that's been used ever since.

In Savannah River and it's written --

the topic of the TIB is neutron exposure. But the subtopic in there that's called out is a portion of SRS.

And certainly other things other than the shallow to deep dose are discussed even in that TIB such as taking a look at what the bioassay situation is for the energy employee.

Obviously the DR is going to take a look at what the CATI discussion entails.

MS. GOGLIOTTI: I think the big question is where did 2.19 come from. Because that document only says greater than two.

CHAIR KOTELCHUCK: Is this an internal discussion between you?

MR. SMITH: Not necessarily. I discussed that in the last meeting. It's in the transcript.

MS. GOGLIOTTI: The 2.19?

MR. SMITH: Yes. It's discussed. I mentioned in the transcript in the last meeting. Well, I talked about it. It is captured in the transcript of the last.

The 2.19 factor is something that

comes out of DCAS-TIB-10. In a sense speculating to a degree, but my guess is that a factor was put in there with the glove box factor TIB in mind.

MS. GOGLIOTTI: I think I'm going to have to review the transcript again and we'll post a follow-up response here.

You directed us here to TIB-7.

MR. SMITH: Right, and I did so last time as well. That's also in the transcript. I'm basically saying the same thing I said last time.

CHAIR KOTELCHUCK: Okay.

DR. ANIGSTEIN: This is Bob Anigstein. I just rejoined the call. This is for part of the discussion if I can shed a little light on this issue.

The 2.19 factor comes from the fact that the dosimeter which is likely worn in the upper part of the body, typically on the lapel, is further away from the source than some of the lower organs and usually the prostate in this instance that was in question.

It has nothing to do with the shallow to deep dose ratio. It's primarily a result from geometry, from the distance.

MR. SMITH: That's correct and I acknowledged that in the discussion on the last meeting. It's in the transcript.

DR. ANIGSTEIN: Okay. I wasn't part of the last meeting.

MR. KATZ: This is Ted. It just sounds like this is something that would be helpful once Rose has a chance to read the transcript from the last meeting and she can confer with Bob and get clarification before we try to hammer this out.

MS. GOGLIOTTI: Okay, great.

CHAIR KOTELCHUCK: I think we've come to a time to set a date for the next meeting.

MR. KATZ: Let me pull up the calendar so I can see where we are.

CHAIR KOTELCHUCK: The question is whether we might be able to meet in early December or we'll have to postpone it until early January, till January.

MR. KATZ: Well, it cannot happen

before early December.

CHAIR KOTELCHUCK: That's correct.

MR. KATZ: Because of the way things work now in the department.

CHAIR KOTELCHUCK: Right. Understood.

MR. KATZ: So December is in the scheme right now, we have a Board meeting on the 13th and the 14th. It may only be the 13th but that's the Board meeting.

And if this meeting is typical we usually have a lot of Work Group meetings swing in in the couple of weeks before the Board meeting.

CHAIR KOTELCHUCK: That's right.

MR. KATZ: It's not the best time to have a dose reconstruction meeting for that reason because you want to leave it as flexible as possible for necessary meetings until the Board meeting.

It really probably is better to actually wait till January for the next meeting if that's okay with the Board Members.

CHAIR KOTELCHUCK: Sure. Second week

in January? Often a slightly quieter week.

MR. KATZ: So, January, the week of the eighth. That -- I don't know when the holidays are but I don't think there's any that week.

CHAIR KOTELCHUCK: No. The 15th is Martin Luther King's birthday.

MR. KATZ: I think that week's probably good.

CHAIR KOTELCHUCK: Yes.

MR. KATZ: Yes, the 10th is not good, but 8th, 9th, 11th.

MEMBER BEACH: The 11th doesn't work for me.

CHAIR KOTELCHUCK: You say 11th does or does not work?

MEMBER BEACH: Does not.

MR. KATZ: So how about the 9th? That's a Tuesday.

MEMBER BEACH: That's good.

CHAIR KOTELCHUCK: Good for me. Pardon?

MR. KATZ: I'm sorry, Wanda, we

couldn't hear you.

MEMBER MUNN: That entire week is problematic for me.

MR. KATZ: Okay, then let's do --

MEMBER BEACH: The next week I'm not available.

MEMBER MUNN: Okay, so in a case like that I'll probably be in a spot -- I'll be traveling, but I'll probably be in a spot for example on the 9th I could probably do that even though I'll be away.

CHAIR KOTELCHUCK: Well, if you could, could the 9th work for most of the rest of us?

MR. KATZ: It just needs to be fairly reliable, Wanda, because these days we're cutting close with our quorum.

MEMBER MUNN: I realize that and that's why one never knows in these vacation situations whether the facility where you are is going to truly have reliable wifi or not. That's what it really comes down to.

I will have my cell phone with me and if worse comes to worst I can do that, but it's

really bad if I don't have the screen.

Let's go ahead and do it if that's what fits for everybody else. Because the next week is not going to work and the week after that is getting two months away from where we are today.

CHAIR KOTELCHUCK: That's right. I agree. Let's try to find, however, one backup date.

MR. KATZ: Yes, I need a backup date anyway.

CHAIR KOTELCHUCK: In case David Richardson --

MR. KATZ: Right.

CHAIR KOTELCHUCK: John, by the way, is the 9th okay for you? John Poston?

MEMBER POSTON: Yes. Can you hear me?

CHAIR KOTELCHUCK: Yes, there we are.

MEMBER MUNN: Now we can.

MEMBER POSTON: Dave and I were talking at the same time. So I think that's okay with me.

CHAIR KOTELCHUCK: Good.

MR. KATZ: So the 9th is first choice

and then let's just choose a date on the week of the 22nd as a backup.

CHAIR KOTELCHUCK: Correct. I'm free.

MEMBER BEACH: I'm clear on all of them.

CHAIR KOTELCHUCK: And I am as well.

MR. KATZ: How about -- well, they're all fine. How about Wednesday the 24th?

MEMBER BEACH: Okay.

CHAIR KOTELCHUCK: Sure.

MR. KATZ: Okay. It's just a backup.

MEMBER CLAWSON: I just realized that Mondays and Wednesdays I will have to leave earlier than that so I may not be able to be a part of it the last hour or so.

MR. KATZ: You have to leave by what time, Brad?

MEMBER CLAWSON: I have meetings on Mondays that would be 3 o'clock your time and on Wednesdays I have them at 4 o'clock.

MR. KATZ: That'll be okay anyway.

CHAIR KOTELCHUCK: Oh, yes, 4 p.m. that's fine. We're normally pretty close.

MEMBER MUNN: So we're doing the 23rd as backup?

CHAIR KOTELCHUCK: The 24th.

MR. KATZ: The 24th is backup. That's a Wednesday. And we'll scheduled for the 9th. I'm just going to send both of these dates to David Richardson.

MEMBER MUNN: Sounds good.

Adjourn

CHAIR KOTELCHUCK: Okay. Folks, thank you all very much. Productive meeting.

MEMBER MUNN: Thank you. Have a wonderful day.

(Whereupon, the above-entitled matter went off the record at 4:05 p.m.)