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WORKING GROUP

ADVISORY BOARD ON

RADIATION AND WORKER HEALTH

PROCEDURES REVIEW

The verbatim transcript of the Working Group Meeting of the Advisory Board on Radiation and Worker Health held in Cincinnati, Ohio on Aug. 29, 2007.

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TRANSCRIPT LEGEND

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P R O C E E D I N G S

AUGUST 29, 2007

(9:30 a.m.)

OPENING REMARKS

DR. WADE: Good morning all. This is the work group conference room. This is Lew Wade, and the entire work group isn't here yet. Ms. Munn has decided to proceed so we're going to being with my usual sort of monologue.

This is the work group on procedures review, and the work group is chaired by Ms. Munn, members Gibson, Griffon, Ziemer, Presley as an alternate. Right now in the room we have Wanda Munn and Paul Ziemer. We're awaiting Mike Gibson and Mark Griffon. We believe Robert Presley will be on the phone. Robert's an alternate.

Are there Board members on the phone right now?

MR. GRIFFON (by Telephone): Yeah, Lew, this is Mark Griffon. I'm on the phone. I'm sorry. I've been on for a few minutes. I just didn't hear any action.

DR. WADE: Thank you.

Is Mike Gibson on the phone?

(no response)

DR. WADE: Is Robert Presley on the phone?

(no response)

DR. WADE: Are there any other Board members on the phone other than those named as part of the work group?

(no response)

DR. WADE: Okay, so we don't have a quorum of the Board, and it's acceptable to proceed. So we have Munn, Ziemer in the room, Griffon participating by telephone.

What we'll do is go around the table here and let people identify themselves, then we'll go through our normal run of people on the telephone that will be NIOSH/ORAU team members, SC&A team members, other feds who are working today as part of this call, members of Congress or their representatives, workers or anyone else who wants to be identified on the call. So let's start around the table here.

MS. HOWELL: Emily Howell, HHS.

DR. MAKHIJANI: Arjun Makhijani, SC&A.

MS. MUNN: Wanda Munn, Advisory Board and Chair of this session.

DR. ZIEMER: Paul Ziemer, Advisory Board,

member of the work group.

MR. HINNEFELD: Stu Hinnefeld, NIOSH/OCAS.

MS. THOMAS: Elyse Thomas, O-R-A-U team.

MR. SHARFI: Mutty Sharfi, ORAU team.

MR. CHEW: Mel Chew, O-R-A-U team.

MR. MARSCHKE: Steve Marschke, SC&A.

DR. MAURO: John Mauro, SC&A.

MR. McGOWAN: Bill McGowan, University of Cincinnati, not a member of the committee but an observer.

DR. NETON: Jim Neton, NIOSH.

MS. BURGOS: Zaida Burgos, NIOSH.

DR. WADE: Larry Elliott is around the table but left the table just briefly.

This is Lew Wade, works on the Advisory Board and works for NIOSH.

Let’s go out to the telephone and hear from other NIOSH or ORAU team members who are on the line.

MS. BRACKETT (by Telephone): This is Liz Brackett, O-R-A-U team.

MR. SIEBERT (by Telephone): Steve Siebert, O-R-A-U.

MR. FIX (by Telephone): Jack Fix, ORAU team.

MR. GUIDO (by Telephone): Joe Guido, ORAU team.

MR. SMITH (by Telephone): Matthew Smith O-R-A-U team.

MR. KATZ (by Telephone): Ted Katz, NIOSH.

DR. WADE: Other NIOSH or ORAU?

(no response)

DR. WADE: How about SC&A?

DR. BEHLING (by Telephone): Hans and Kathy Behling.

DR. ANIGSTEIN (by Telephone): Bob Anigstein, SC&A.

DR. WADE: Other SC&A team members?

(no response)

DR. WADE: Are there other federal employees on the call by virtue of their employment?

MS. HOMOKI-TITUS (by Telephone): This is Liz Homoki-Titus with HHS.

DR. WADE: Welcome.

MR. KOTSCH (by Telephone): Jeff Kotsch from Labor.

DR. WADE: As always, Jeff, welcome.

Any other feds?

(no response)

DR. WADE: Members of Congress, their

representatives?

(no response)

DR. WADE: Are there any workers, petitioners or their representatives on the call?

MS. QUINN (by Telephone): Trish Quinn, Center to Protect Workers' Rights.

DR. WADE: Thank you.

Anyone else on the call who wishes to be identified for the record?

(no response)

DR. WADE: Okay, before we begin, again, some simple rules of etiquette. Please, if you're speaking, use a handset and not a speaker phone. Mute whatever instrument you're dealing with on the telephone when you're not speaking. Be mindful of background noises, and again, just think about your situation and how it's broadcast to others and it might affect the ability of the group to function most efficiently.

With that, Wanda, it's all yours.

MS. MUNN: Thank you, Lew.

ADDITIONS OR REVISIONS TO AGENDA

I hope most of you have a copy of the

rough agenda that I hope to be able to follow today. Anyone who's been on more than one of these meetings knows that we have far more than we can possibly get through in a single day, but we're going to get through as much of it as we can. And I have every intention of touching each of the items that I've shown on the agenda so we may have to cut some of our deliberations short just so that we can get to all of the items that are listed.

REVIEW ACTION ITEMS FROM 6/26/07 TELECONFERENCE

Let me go over my list of action items from our last meeting which was a teleconference held on June 26th. The action items that I have listed are for SC&A to verify the review of all procedures from the first matrix which was originally issued as final on July 23rd of 2006, and specify each outstanding issue from that list.

To provide the protocol used in workbook reviews and to create a matrix supplement to crosswalk all TIBs and PROCs.

To provide a table showing what's been reviewed and what has not.

To re-send the approach to PERs

information to work group members.

To re-issue a second working draft, 5/21/07 matrix including numerical level of concern and indicating an asterisk for any changes from earlier assessments.

SC&A and our designated federal official were to discuss and resolve with the contracting officer whether addenda to existing SC&A reports are acceptable for reporting reviews of revisions to procedures resulting from earlier evaluations.

And, NIOSH was to report on whether the global issues of ingestion internal dose resuspension that were raised earlier have been adequately addressed in subsequent procedures and indicate where that was.

Are those action items in line with memory and understanding of others around the table?

(no audible response)

MS. MUNN: Good. Then with the hope that one of the simpler, most easy to complete of those items was the outcome of the discussions with the contracting officer, I'd ask that perhaps Lew could address that.

REPORT ON OUTCOME OF DISCUSSIONS WITH CONTRACTING OFFICER RE ADDENDA TO SC&A REPORTS

DR. WADE: During my discussions with the contracting officer, it's determined that, yes, that addendum are an acceptable mechanism for doing such reporting.

John, I don't know if you've pursued that within your organization.

DR. MAURO: The addendum to the procedures has been re-issued. It was released, and the matrix reflects that. In other words the Supplement One that was delivered, I believe, about a year ago has, in fact, been modified. Two or three of the reviews have been updated, and I believe everyone should have hard copy of that addendum along with a revised matrix that, as you may recall, we wanted to add into the matrix, the score.

Everyone should have a copy of that. In fact, the latest version of it that Stu put out on Friday or Monday also has at least some of your responses. So I think we're pretty current and have been keeping a track on the addendum approach.

MS. MUNN: It looks like we're all right.

DR. WADE: We're better than all right.

MS. MUNN: We're better than all right. We are ahead of schedule by ten minutes.

SC&A COMMENTS ON REVIEW OF FIRST MATRIX, OUTSTANDING ITEMS LIST

We're ready for SC&A's comments on the review of the first matrix and the outstanding items. And let's all make sure we're working from the same matrix when we start.

DR. MAURO: I think you're referring to this crosswalk at this time from the first matrix and the carryover.

MS. MUNN: Yes.

DR. MAURO: And there was a package that Kathy Behling distributed for the crosswalk to make sure that we're tracking closure. And I believe Kathy is on the line, and she's in a much better position than I can since she put together the matrix dealing with the crosswalk. And I believe that's what you're referring to.

MS. MUNN: Well, actually, we can do that if we want to. I have that scheduled for later in the discussion, but we can do that first if it's easier for you and for Kathy.

DR. MAURO: Well, I only bring that up because I thought that's what you were referring to. I may have cross-wired on you.

MS. MUNN: No, that's fine. I have that listed after our break, but if you think that will be a relatively easy one of our attacks to get through then perhaps we should.

DR. WADE: For the record Mike Gibson has joined us. Welcome, Mike. All of the work group members are now participating.

MS. MUNN: Your call.

DR. MAURO: Well, apparently, you're referring to something else, and I'm not quite sure what that is.

MS. MUNN: I was talking about getting right into the --

DR. MAURO: Oh, the big matrix.

MS. MUNN: Yes.

DR. MAURO: That's fine. We can do that also.

MS. MUNN: I expected to do that so that we could very quickly see what has been accomplished by all the participants and take a look at NIOSH's most recent distribution of that.

DR. MAURO: That's bringing us to the big --

MS. MUNN: The big one.

DR. MAURO: -- with all the 33 procedures.

MS. MUNN: I thought we'd get some feel very quickly for how far we have to go and what we've completed here.

DR. MAURO: That being the case in terms of the way I'm tracking it --

MS. MUNN: Hold on.

MR. GRIFFON (by Telephone): I'm sorry, Wanda. This is Mark Griffon. Can you just tell me which matrix you're referring to? I'm --

MS. MUNN: We're talking about Supplement One, Rev. One. We're talking about the document that was just a re-sent with NIOSH comments on it the day before yesterday.

MR. GRIFFON (by Telephone): Okay, thank you.

DR. MAURO: I guess it's best for me to sort of start this. I'm hoping everyone can hear. Can everyone hear me on the line? I'm pretty far from the microphone. I guess I'm okay.

As you're probably aware the way in which we did this is we divided up, I think

there were about 33 procedures that we reviewed, and we divided up amongst various experts. And what I've done is to get things started, the very first procedure that we reviewed is a procedure OCAS TIB 0010 dealing with the glove box.

Mainly, these were a procedure whereby a person's working at a glove box, and he's wearing his film badge or TLD on his lapel. You're concerned about the exposure he may have gotten to, let's say, the bladder. There's an adjustment factor that's needed. And that procedure deals with that subject. And Bob Anigstein performed the review.

Now we could go one of two methods. We could just summarize our findings regarding that procedure, or I guess Stu, if you prefer, since you folks are in the process of reviewing our commentaries on each procedure. So whichever way to go forward. Whether we should take the lead or whether NIOSH should take the lead. It's certainly your choice.

MS. MUNN: Well, there's yet a third one, and that is the process that we discussed by phone during our earlier meeting, whether we

wanted to concentrate on the items that were already ranked as ones, twos, threes, et cetera. So my personal preference would be to spend first a few minutes concentrating on those ones and twos to see where they were and then after that proceed from the viewpoint of whether NIOSH has specifics other than the ones that they responded to.

I really would like to take a look at the responses that NIOSH has made to see if we're going to have a resolution to those at this meeting or whether we're going to go further. Does anyone have any problem with addressing the ones and twos first just to see where we are?

(no audible response)

MS. MUNN: If not, then I would prefer that we run down the rating list, and when we encounter a two have a quick response from first SC&A and then NIOSH with regard to where we are. And in that manner go through the ones and twos and then address the items that NIOSH has responded to just this week.

MR. ELLIOTT: Are you suggesting that, well, let me propose this as a modification. There

are several TIBs or TBDs that have been reviewed here, and the first one that John just referred to, NIOSH has not provided a response to yet. And so I don't know that it'd do great service at this point to talk about TIB-001 and a rating of one, two or so until we come back with our reaction to that criticism.

MS. MUNN: It's rated a three; and therefore, from my perspective it's not the place to start.

MR. ELLIOTT: I'm sorry.

MR. HINNEFELD: But on this document there are twos. There are twos and we've not prepared a response. We've not analyzed the finding and prepared a response on this document. So our preference, I think, would be to go to the ones where we have provided a response unless we, because, you know, I'm not completely familiar with the report.

SC&A's attempt to describe pretty well the finding in their report. The matrix finding is for the summary or brief statement of it. But their findings are generally pretty well developed and pretty well

described in their report. And we just have not gone through the exercise. We had ORAU staff work on ORAU-prepared documents. We just have our own staff available to work on these, and so we haven't provided responses on these.

MR. ELLIOTT: For completeness I would suggest that we can say for TIB-0010 we understand the comments that they've made, and we are working on those. But we are not prepared at this point to speak about where we're at with regard to our reactions.

MS. MUNN: Because I want to make sure that we cover two things. I want to make sure we're covering the items that are marked one, and the items that NIOSH has responded to. Then if we want to eliminate, my suggestion with respect to twos, I have no objection to that. But I really would like for us to take a look at all the ones to see what we actually have out there. And then take a look at what NIOSH has responded to if that's satisfactory.

(no audible response)

MS. MUNN: Nodding heads.

DR. ZIEMER: And just a quick question on

the matrix where it says NIOSH response. On those documents which are O-R-A-U procedures, those are actually responses from OCAS staff rather than NIOSH staff but reviewed by NIOSH?

MR. HINNEFELD: They have been at this point probably nominally reviewed. We just got them, and we provided them to the Board rather than spend the time reviewing it and not having them available.

DR. ZIEMER: So where it says NIOSH response --

MR. HINNEFELD: In large part that's ORAU.

DR. ZIEMER: In large part it's O-R-A-U team response.

MS. MUNN: All right, so if we're looking at the copy of Supplement One that was just e-mailed to us this week, and we're looking at the ratings only, then the first one that I see is on page six of that --

DR. ZIEMER: Supplement One, Rev. One.

MS. MUNN: Supplement One, Rev. One. It should have Monday's date on it, the 26th, I believe. On page six, ranking one is ORAU OTIB-0020.

DR. MAURO: That's correct. And I believe

that particular procedure was reviewed by Hans Behling. I'm hoping --

Hans, are you on the line?

DR. BEHLING (by Telephone): Yes, I am.

DR. MAURO: I'll give you a second to sort of catch up. I believe that was OTIB-0020, and I have to flip through the report to get the correct title, "The External Coworker Model," and in your review at least one of the elements of your review had a one in it, and I guess I'm going to give you a sort of a chance to catch up. Do you have the matrix or your report in front of you?

DR. BEHLING (by Telephone): I have both the matrix and the report. And I guess I just want to make a comment here. Obviously, everyone hopefully has had a chance to review both the report itself as well as the matrix which only gives you a snapshot of the issue. But let me just point out that some of the comments that are in that report really go to a basic issue here that I found to be a problem.

And that is it is an issue of plausibility versus what might be considered

practical or achievable. And having been involved in auditing dose reconstructions that oftentimes involves a thorough review of what the information is that is available to a dose reconstructor out in the field, many of the comments reflect that dichotomy between what is theoretically possible versus what is reasonable and what is available to the dose reconstructor when he sits in his cubicle some place and does this dose reconstruction. And so keep in mind that this particular issue, plausibility versus practicality.

Finding 4.1 is the one that I identified as having a low value, and that is due to the fact that, again, it's an issue of what are the subjective elements to this? The dose reconstructor has to make an awful lot of decisions here that may or may not be available to him. And I believe that many of these decisions are likely to be very subjective in nature. Again, you have to really go through the report to come to that conclusion.

That is, how do you know when a worker has no records. Is it due to the fact that he

was monitored? Is it due to the unavailability of records that may have been lost? The difference between the 50th percentile and 95th percentile value, these are all things that you may or may not have information. When you get a folder from the DOE that says no records available for this person, how do you know whether or not he is a person who may have been only on occasion been exposed to radiation that was monitored.

Was he a person who was routinely, yes, I know that if you dig hard enough you can probably come up with something that might give you some clue as to whether a person was routinely exposed and not monitored versus only occasionally or never. But these are all very, very subjective issues that somehow or other the dose reconstructor has to come conclude before he makes a decision whether to assign the 50th percentile, the 95th percentile.

And even there you have to know whether or not this is likely to be compensated, whether POC is equal to or greater than 45 percent. So those are really

the bulk of the issues that define this particular TIB-0020. And I believe they're all basically identified and the responses from NIOSH, obviously they're responses, but again, I'm going to have to back away and say, well, somebody else has to make the decision whether or not this is reasonable.

And quite frankly, having -- and I've sort of divorced myself at this point from the auditing process of dose reconstruction. But Kathy is very much involved at this point, and I've conferred with Kathy on this issue. And I said have you ever seen TIB-0020 being used, and the answer is no. And so the question again comes into play whether something that can in theory be done versus one that is practical and usable.

MS. MUNN: Hans, thank you for an overview. May I hold us up for just a moment and point out to everyone that although we were focusing on the number one in the rating column, that we actually have a half dozen almost OTIB-0020 issues here, and probably one of them should not be discussed in segregation from the others. So if we might have just a few

minutes to give everyone an opportunity to review both the SC&A comments and the NIOSH comments for all of the OTIB-0020 items instead of just this single one it might be beneficial to everyone.

DR. MAURO: I have a suggestion because in going over the material and reading it one of the things that I noticed is that every OTIB has a certain objective and is trying to accomplish something that's important to the dose reconstruction process.

And I noticed that now we're jumping right in, going into a number, OTIB-0020, and then we're zeroing in into one element in it. So it's very difficult to dive right into that specific without sort of stepping back for a second and say, okay, what is this OTIB about? And what's it trying to accomplish?

And for example, if you look at the big book, and you go to the checklist, you quickly see, okay, there's a lot of scores here. But one particular score came out with a one. The point Hans is making there's a specific aspect to this particular OTIB that deals with a particular subject that is

troublesome to us, and we assigned it a one.

So I think maybe the best way to communicate or get on the same page is maybe a quick 30-second sound byte, what is this OTIB about? What is it trying to accomplish? So everybody's oriented. And then why is that a concern, namely a judgment that is embedded in this particular protocol?

There's a certain degree of judgment that needs to be made by the DR that is subjective. And our concern is that that being the case you create a situation where it's possible that different auditors or different dose reconstructors may very well come to a different judgment on a particular matter, whether to use the 50 percentile versus a 95th percentile so there are various subjective judgments.

And I think what needs to be discussed with NIOSH here is the degree to which that is a real concern or whether or not it's well in hand. So I think maybe this process we're doing which we're inventing as we go, maybe the best way to go is that when we hit a procedure that has a one, real quickly get an

idea of what the procedure is about and why that particular one might be important.

Maybe it would be helpful -- I don't know if everyone else agrees -- if, Hans, if you could sort of step back and just give a quick overview of this particular procedure. And then within that context why that one might be an important issue that we need to discuss.

And I guess, Stu, you folks have responded to that and your sense, of course, is that, well, perhaps it's not as serious a problem as we may have made it out to be. I think that will be a productive way to proceed.

MS. MUNN: It would be a productive way to proceed after we've done what I've just suggested that we do which is let's take a moment and everybody read all of the commentary that we have on the matrix with regard to OTIB-0020. That will take you back to, given the most recent copy that we're looking at, OTIB-0020 begins on page five.

MR. GRIFFON (by Telephone): Wanda? Can I ask? I have the matrix, but I don't have the

NIOSH responses in the matrix so I think I don't have the most recent version. Do you know --

MS. MUNN: Do you have your e-mail up?

MR. GRIFFON (by Telephone): I do, yeah, do you know when it was sent?

MS. MUNN: It was sent on the 26th. Sent Monday morning very early.

DR. WADE: Now there's no NIOSH comments on the first couple of pages so it might confuse you. On the first page there's no NIOSH comments, but as you get into it there are.

MR. GRIFFON (by Telephone): Sent on the 26th from Stu?

MR. HINNEFELD: From me.

MR. GRIFFON (by Telephone): All I saw is OTIB-0052.

MS. MUNN: No, that's a separate thing.

DR. WADE: Can you send it?

MS. MUNN: Arjun is telling me it's the 27th.

MR. GRIFFON (by Telephone): All I have on the 27th from Stu is the initial responses to OTIB-0052 findings.

DR. MAKHIJANI: I can send it to you if you have your --

MR. GRIFFON (by Telephone): Yeah, if you could forward it again, thank you.

DR. ZIEMER: Is there a separate report on this one? There are on some of the TIBs. What's the electronic reference for that one?

DR. MAURO: The actual hard copy report, the original report -- let me step back. It might be helpful. This is task three where our job is to review procedures. And we were reviewing procedures in groups of about 30. The original set of 30 were reviewed, by and large closed out, there may be some mop up.

Then the second set, and a report came out. And that report actually came out in, I believe it was dated on the order of June 2006. Now during the last meeting when we were about to engage this particular set of procedures, I volunteered to -- listen, it's been a year since, you know, we wrote that report, and we realized in getting ready for that meeting that we've learned a lot. A lot of things have changed; we've learned a lot.

And we also had a matrix. And the matrix did not -- it's a big matrix, 37 pages, and so one of the things I volunteered, I

said, listen, why don't we do two things. Let's edit our June 2006 version of this report and re-issue it with the revisions? And it turns out two, three or four procedures were revised, and we re-issued the report.

And it's actually dated now August 2007. The delivery date was August 17th, so it's relatively recent. But by and large it's very similar to the original one except for a few procedures. In addition --

MS. MUNN: Did we get the page changes over into the matrix?

DR. MAURO: And the matrix, yeah, captures, it's up to date. And the matrix that came out captures all of the changes that were there. In addition, it adds in the score card. Remember we wanted to put the score card in?

MS. MUNN: We agreed we would do that.

DR. MAURO: And we did that, and even more was done. NIOSH had a chance at least to take a run, at the 11th hour I would imagine, to try to be responsive to as many that they could. So that's where we are right now. So hopefully, everyone has the matrix that's 37 pages, and everyone has the August 2007

version of this what's called Supplement One Procedures. The second set of 30, it turns out I think it's 33, procedure reviews. I'm trying to sort of set the stage. It's complicated.

MS. MUNN: Right.

MS. BEHLING (by Telephone): Excuse me, this is Kathy Behling. In answer to Paul's question also, the file name was called Transmit Draft S-C-A-dash-P-R-dash-pass three-dash-0-0-0-1-dash-rev-dash-1, and it was a PDF file.

And, John, you are correct. When I re-submitted the matrix, I did, the matrix does reflect this Rev One and the page changes on the Rev One. And I also included for those changes that I made to ensure that there's a vertical line on the left hand margin so that you can see what has changed.

DR. MAURO: That's in the main body of the big report. As you flip through the pages you'll see a vertical line, and that's the place where the changes are made.

DR. MAKHIJANI: If anybody doesn't have the report, I have the e-mail in which it was

transmitted to me. I can send it to anyone who wants it.

MS. MUNN: Stu, would you like to take a run at what John has suggested with respect to what OTIB-0020 is really all about and go through the responses that we have here?

MR. HINNEFELD: OTIB-0020 is sort of a guiding document more so for people preparing later site-specific OTIBs that have actual coworker data in them and is for a dose reconstructor to pick up and use. And so it pretty much describes this is how we will take these datasets and build coworker distributions. That's primarily what it's used for.

The issue you raised though, the one about 50 percent versus 95 percent is an issue in the use of coworker in general. So if we can address it here which would be a lot more efficient than addressing it every time we pick up a site-specific TIB. And I think --

Mutty, step in and say something if I say something wrong here because Mutty does dose reconstructions certainly far more than I do.

But when choosing in this situation, as a general, we know the sites, the DOE sites, that give us what they have. When you're talking about when a person doesn't have monitoring data, it's because the DOE didn't find it and send it to you or was it lost or monitoring was lost. We don't know that, people who were monitored and lost. We know the sites, the DOE sites, that provide us a full report. We pretty much know those, so they gave us what they have, and so we go with that.

Once we have that information though, we typically don't just get the monitoring information in a void. We got some information either from the claimant himself or from maybe it's in a DOE record. Some of the records may include some things that gives you an idea what their job was.

And so mainly we rely on job title to make a judgment about is this person someone who would have been a radiation worker because quite likely there were a large number of people who today we would probably consider, well, they were a radiation worker or at least

a periodic radiation worker, and they should have been monitored who were not monitored at the time so you won't get any record for them.

So in most instances where the job appears to be, any job where they could be even periodically exposed, those people get the higher percentile. In other words, if they would be regularly exposed, they would get the 95th percentile.

And it's only when we can decide with some confidence that the person was really an administrative worker who wouldn't be a radiation worker in today's nomenclature, that we would give them the 50th percentile which is still, you know, that 50th percentile was the monitored people. That's still a pretty generous assignment for someone that we conclude probably wasn't exposed.

So that's how we arrive at that selection. I don't know that we've got anything more formal written than that, but it does have a dose reconstructor who makes the judgment. The peer reviewer's judgment, a peer reviewer from the dose reconstruction organization can also say, you know, you

judged wrong. And then there's a Health Physics review from the Health Physicist on OCAS' side. So three different people have to concur that that this person really, there's sufficient evidence that this person wasn't exposed in order to give them the lower percent.

DR. MAURO: I think one of our concerns was that when those judgments are made, and I understand the ground rules that you just laid out, when we have a DR that comes in 46 percent, that judgment becomes critical. And it's at that place where I felt that if there's any ambiguity, this is the place where you could have a reversal if that judgment wasn't bulletproof.

I guess that's where we came in; why a one was important here. There are going to be times when those judgments don't make a difference, but there are going to be times when they do make a difference. It wasn't apparent to us whether or not there was anything a little bit more structured in terms of that judgment.

MR. HINNEFELD: Well, I think Matt Smith who

prepared the response on this, I believe Matt's on the line.

Matt, do you have anything more you wanted to offer?

MR. SMITH (by Telephone): Stu, you did a good job summarizing the responses I wrote up. Again, I would tell the group to keep everything in context. When it comes to prescriptive guidance, as Stu stated, that's where site-specific OTIBs would come into play.

Regarding the general 50th and 95th percentile issue, there's a written response on that as well. And if you folks want to look at the final table in OTIB-0020, you'll see there a comparison of some different data analysis approaches, the one being the OTIB-0020 method if you will. And the other one being a maximum likelihood approach which I know has been discussed before.

And I think you'll see that the OTIB-0020 approach is quite favorable across the board. As Stu mentioned, even the 50th percentile values are giving us a good cushion of claimant favorability.

Other than that, again, the dose reconstructors are not working in a vacuum in a cubicle. They have not only other documents to look at. They have what we term site DR leads. For instance, Mutty is the DR lead for Rocky Flats. So they have a, if you will, a senior dose reconstructor to refer to and to bounce questions off of regarding how the data looks.

And then beyond that there's also, as Stu mentioned, a peer review process. And unless there's further question, I think I'll leave it at that.

DR. BEHLING (by Telephone): This is Hans Behling. I just wanted to again go back and address the issue of the subjective nature, and I think I'm really focusing on earlier years when, especially early years when cohort badging was a matter of fact in the way of monitoring workers where people who should have been monitored were not monitored, and they may have been decided on because they're (unintelligible) exposed group, but clearly were exposed.

And subjective interpretation on the

part of the dose reconstructor to decide what portion or what periods of time does the worker qualify for the statement that he should have been monitored but was not monitored or by today's standards he needed to be monitored, et cetera, et cetera.

That's really the issue that I want to bring out here on this particular TIB is that we're not dealing with a single issue here but a variable issue that changes over time because of various practices that were in vogue in the early years in the '40s, '50s and '60s that were subsequently much more restrictive later on when people were, as a whole, regarded as all potential exposures, and therefore, the issue that we have to address here is not a single issue but one that changes over time.

DR. NETON: Hans, this is Jim Neton. I just got a question. I understand your concern about the potential misapplication of 50th versus the 95th with the dose reconstructors. But I think as Stu pointed out we tend to be extremely conservative in our approach to selecting those values, and there's multiple

checks along the way.

I guess my question is of all the dose reconstructions SC&A has done has there been any evidence to indicate that we have improperly or possibly improperly assigned 50th versus 95th? Because in my mind the proof is in the practice.

DR. BEHLING (by Telephone): Well, as I started out by saying to date I don't think we've ever seen a dose reconstruction report that even makes use of OTIB-0020.

DR. NETON: As selecting the 50th versus the 95th? No.

MR. SHARFI: One of the main differences we don't reference specifically OTIB-0020 since we reference the site-specific --

DR. NETON: Exactly, so we --

MR. SHARFI: -- coworkers.

DR. NETON: -- we have clearly used the 50th versus the 95th in multiple cases. And that was the issue we were discussing here.

MR. HINNEFELD: But in terms of the ones they've reviewed, I don't know. A lot of the ones they reviewed were dose model, you know, dose model. So it may be that there has not

been a coworker that's been selected --

DR. NETON: I think that might be a good thing to do because, again, the proof is in the facts here. I think we certainly believe we've got a conservative approach, and I don't know any way around that. I don't know what the solution would be other than to look at some of these things and see. Have we not appropriately assigned a dose?

MR. SHARFI: I would add on OTIB-0020, it's a general coworker application TIB. When you're doing DR, you do need site-specific information to make decisions and to put a general blanket, across-the-board, complex decision process into a TIB that's not site specific almost hinders you from using claimant and site-specific information. So areas like that might be more suited to the site-specific coworkers if there's knowledge that they've done batch monitoring or stuff like that. Or if you know specifically that they badged everybody, that stuff can be very more site specific rather than putting them into a complex-wide TIB when this TIB just covers how to develop and the general use of

coworker. It's not really designed for site-specific application.

DR. MAURO: Am I hearing that for all intents and purposes this TIB is general guidance, but in practice it really doesn't come to the surface? That is, what I'm hearing is the reality is every case is being dealt with on the merits of that particular site and its dataset as opposed to drawing upon some overarching universal guide such as this one. So perhaps --

MR. SHARFI: For instance like you have the Rocky Flats external coworker would have referenced OTIB-0020 in development of that coworker set, but the DR would not have referenced OTIB-0020. They would have referenced the site-specific coworker. So it's maybe one removed from the original DR.

DR. MAURO: To ask an embarrassing question perhaps this is a procedure that really is really not all that relevant?

MR. SMITH (by Telephone): Well, it is a relevant procedure because it serves as the keystone for the follow-on series of external coworker TIBs that have been developed. And

everyone in the room there stated the correct thing, and that language is located in Section One, The Purpose, where it does talk about using OTIB-0020 in conjunction with separate TIBs that provides a site-specific coworker. So it is a keystone document.

DR. MAURO: Okay, so I just want to make sure I understand. So in effect this is the keystone that sets the philosophy and then the philosophy is implemented on a case-by-case basis according to that philosophy.

MR. SMITH (by Telephone): That's right.

DR. MAURO: And the degree to which the way in which it's implemented is consistent, really emerges on the actual application for a particular site. So that's really where the -- in effect, the concern that we have would become realized. I guess maybe another way in what we're saying is that it is the right question.

Have we come across cases where we felt that the 50th percentile was used when we think that perhaps the 95th percentile should have been used. I don't know if that's something you want to talk about here related

to this particular procedure or is that better suited to be discussed as part of the DR review when we get into our Task Four review process? I think that's where it belongs as opposed to this underpinning issue.

MR. HINNEFELD: Yeah, the forum for discussion can be either one I suppose. I think in order to have a discussion though we'll have to do some preparation and, you know, look through, we should be able to identify of the ones that have been reviewed, did any of them reference a site-specific coworker TIB. In which case that would be an instance where this approach would have been used. So I mean, we could do something like that in preparation for that discussion when we're doing (unintelligible). I don't really know that we have an opinion on what to do there.

DR. BEHLING (by Telephone): Stu, this is Hans. Maybe you can respond to this specific issue or question I have. What is the trigger that would say we should look at OTIB-0020 as a way of reconstructing this person's dose? Let me start out by saying you get a file on a

person who has a claim, and the DOE file says there are no data for this person either in bioassay or external monitoring.

And the first reaction would be, well, this person was not a rad worker, and let's just for the sake of claimant favorability assign him the maximum dose based on the TIB-0004 which involves occupational environmental exposure and be done with it. We've seen plenty of those. Now what is the trigger by which this particular TIB would be used in lieu of, say, assigning strictly environmental dose and be done?

MR. HINNEFELD: Well, the trigger would trigger the use of a site-specific coworker TIB. It wouldn't trigger the use of OTIB-0020. It would trigger the use of a site-specific coworker TIB that was prepared on the guidance in OTIB-0020. So the trigger would be the information available about the employee's, essentially, their job title. That is the most important thing that would be looked at is their job title, and do we have sufficient information about their job title and perhaps their location of work.

Although job titles are normally a little more reliable than work location. People tend to move around. Is that information sufficient for us to conclude that this person wouldn't be considered a radiological worker today, was not really exposed, and so the environmental would be the right approach. So that's the trigger. It's largely, the most important thing is job title.

DR. BEHLING (by Telephone): How about in the absence of a coworker model? And again, there are provisions in this TIB that says, well, if you don't have a coworker model to work with, you may also elect to have or to apply what are called or what are stated as reasonable upper limits. And again, this is a very, very subjective term, the reasonable upper limits for someone where there's no coworker data to work with. Again, it sounds nice, but I would sort of look at this and say that's a very heavy request to be put on a dose reconstructor for defining what is a reasonable upper exposure for an unmonitored individual.

MR. HINNEFELD: Well, that would have to be case specific, and I don't know that we actually do that very much. I know we very often have had cases we put on hold to develop a site-specific site profile, or site-specific coworker dataset.

DR. NETON: So I think, Hans, that guidance would be fleshed out in the site-specific TIB. Again, remember this is a general guidance document on how one approaches using, filling in gaps in data. And what comes to mind to me is the Chapman Valve site profile where we had a real sparse amount of data, and we took the highest value ever measured in the urine and used that to reconstruct these workers' doses. But that was not a decision that would be made by a dose reconstructor. That was fleshed out in the site-specific profile. So OTIB-0020 doesn't try to lock you in to a generic approach. It provides reasonable guidelines, but then it says there are other alternative mechanisms that one may use.

DR. ZIEMER: It sounds like this particular TIB, the question you end up asking is the guidance appropriate? Because the actual

application comes out in each specific site or case. The guidance, I think, Hans, you're asking a question, the details on how to apply it aren't given because you don't have that unless you know what site it is that you're talking about. So it seems to me you still end up stepping back and saying is this appropriate guidance.

DR. BEHLING (by Telephone): What I'm always afraid of when I see too much subjective interpretation is consistency. The way I would like to test that is to give a single case to ten different dose reconstructors and see how ten people interpret the guidance given here in their own way and see what is the level of consistency among those people who are independently trying to go through this maze of potential options for them to think in doing a dose reconstruction.

DR. ZIEMER: What I'm hearing is those ten people wouldn't be sent to this document. They would be sent to a secondary document. And the question is, is the secondary document appropriate based on this guidance, I guess it seems to me would be the question unless I'm

misunderstanding its use.

MR. SMITH (by Telephone): In addition to that, Dr. Ziemer, the dose reconstructor is always going to use what's in procedure six which is the external dosimetry procedure. And in there is a table called Table 5.2 which is a replication of Table 1.1 in OCAS' 0-0-1. And that contains the hierarchy of data that a dose reconstructor would use. Coworker data is one of those choices.

And it's absolutely correct. If coworker data proves to be the desirable choice, you're going to go to a specific document. If that document's not available, then as Dr. Neton said, other data that you might find in the site profile as well as documents that continue to come in and get catalogued in our site research database might be referenced.

DR. MAKHIJANI: I guess part of the puzzlement as I look at this is maybe in the four bullets that are in the procedure. Just thinking back on our experience of specifically looking at Y-12 and Rocky Flats external dose questions, the procedure

specifies four different kinds of unmonitored workers who wouldn't be monitored by today's standards, unmonitored but would be monitored today, worker may have been monitored but data not available, and may have partial information. Partial information I think is reasonably clear.

But in the other three categories I think that's where the judgment call comes in, and if I remember, many of our arguments around or discussions around Y-12 and Rocky Flats revolved exactly around the question of how do you know which bin that they fall into when there's a lot of uncertainty. And maybe that's sort of where the procedure doesn't seem specific enough in narrowing down how you make that choice. At least just from somebody who didn't participate in writing the review, it seems to me that that may be a large part of the problem.

DR. MAURO: And especially in the earlier years.

DR. MAKHIJANI: Yes, I should qualify that by saying that it would be especially in the '50s or '40s and '50s.

MR. HINNEFELD: and I think the place to look at that question would be on the site-specific coworker TIBs that were prepared and see what information was available for that site and is it appropriate guidance for people who are going to use this site-specific OTIB which is what would be used in dose reconstruction. Is that sufficient? I think I'm a little, I don't know how you'd do it in a procedure that's generally broadly applicable.

DR. MAKHIJANI: Well, Stu, in reviewing other procedures that kind of have similar issues, I felt that providing an example in a procedure that's very general, or set of examples, is very helpful because it shows you the kinds of things you're talking about without necessarily narrowing it down and being prescriptive.

DR. NETON: The problem with that is it tends to pigeon-hole the whole process because there's a wide range of ways we deal with this. I can think of the one extreme which is everyone gets the 95th percentile, Bethlehem Steel and those where we couldn't even find a

job title to determine who walked through those areas.

And then on the other extreme, people who were administrative office workers at Hanford that never even entered the fence line. They worked in the town, and then that's another extreme where we can say, well, we looked. Clearly, environmental seemed appropriate.

Then you get into people that were not monitored at all, could have had some exposure, and then we'll pick the 50th, but there's a whole range there, and that's what it's trying to accomplish, to accommodate all those different scenarios. I don't know that you can --

DR. MAKHIJANI: Wouldn't those two examples of those two extremes be useful in this procedure so it's not --

DR. NETON: In fact, that's what Stu was saying. Those are part of the site profiles. The site profiles actually do that, but it could go in there. Whenever you put examples that tends to lock people into certain scenarios, and then it's what about this then,

and what about that, and those are all discussed at document preparation time in the site profiles. And those documents go through multiple layers of review as well.

DR. ZIEMER: I've determined in hopes that this doesn't become the working group on -- what is this procedure? Twenty. OTIB-0020, it seems to me that we kind of have a feel for what this procedure is. As I looked at the reviews, there's a lots of threes there. In fact, I think all threes of them is this particular one.

And I don't know if we know the importance of the one at the moment, but we kind of have a context for it. And I'm wondering if it wouldn't be useful to proceed and sort of set this aside for the moment. I don't think we can resolve it necessarily. The one at the moment represents a kind of concern to make sure that the procedure or the OTIB is properly used. And I think we've heard that proper use of that plays out in other OTIBs as I understand it.

So I'm wondering if it is inefficient to focus too much more time on this at the

moment until we get the overall picture which I know you wanted to go through maybe a number of these and see where the ones are. And this is one of the ones. But it doesn't look to me like it's necessarily going to be resolved sort of momentarily.

MS. MUNN: Unfortunately, it doesn't.

DR. ZIEMER: Unless we have the bigger context of the use here --

MS. MUNN: I do want to get --

DR. ZIEMER: I think we have kind of a feel for the context of this particular one, numerical one, and I'm wondering if it would be helpful to look at the other ones that you had in mind.

MS. MUNN: I think it would, but before we leave this, I think the discussion has brought to the forefront the key issue as it appears to have evolved here. That key issue being shall we use general guideline procedures or must general guideline procedures contain the amount of specificity that creates rigid application of the procedure.

My personal feeling is that general guidelines are very helpful. They are a

baseline from which other applications can be derived. It's a pointer to show the way and method for defining limitations. It appears to me the procedure as I recall it, not having read it in several months, comes close to that.

But if that's the key question, we need to define it. If it's not, then we need to define what is the key question here.

DR. ZIEMER: Well, I think I agree with what you're saying and that guidelines, per se, don't necessarily need that specificity. Let me mention sort of the classic cases where a regulation says that doses are to be as low as reasonably achievable. What does that mean? It means something different in every situation, and you can't spell it out except philosophically at the front end. And it may be that the philosophical statement here is not, well, it probably isn't clear at the front end that that's really what it is. But it may be that the procedure itself needs some, I don't recall. We'd have to go back and look at the front end an explanation of what this is, that this is a general guidance

or something. Maybe it already says that. I don't recall.

MR. HINNEFELD: I'd have to look.

MS. MUNN: Hans --

DR. ZIEMER: But anyway, it may need some fixing based on this, but and maybe even that particular case that got the one may need some clarification that says that this is sort of a philosophical statement and it's played out in specific cases.

MS. MUNN: Hans and John, would you be comfortable with our taking another look at the procedure to see if it's clearly defined in the manner we've described here? And if not, the addition of some words making clear that this is as it's been characterized, a keystone not the actual procedure for directing how to proceed? Is that acceptable to you?

DR. MAURO: I'll offer one thought on it seems to me that the significance really comes to life in the application on real cases at real sites. If we find that, holy mackerel, gee, we have a whole bunch of real people at real sites where judgments were made that we

don't entirely agree with. That is, you may have used the 95th percentile or 50th percentile where in our opinion, in our review, audit of the case, it should have been the 95th percentile.

And by the way, that might be important because in this particular case it creates a situation where there's the possibility for reversal, and especially if we have a number of those and they merge. Then we have to ask ourselves the question if we all agree, yes, that's a problem and that needs to be fixed in these real cases. And we'll discuss it.

Then the deeper question goes, well, is the problem because of this procedure because this procedure did not give the dose reconstructor the directions that could have helped him be a little bit more rigorous in making these judgments. Or is the procedure fine.

It's really that, I'm not sure. In other words if there is a breakdown some place where judgments are being made and no optimum judgments in terms of being claimant

favorable, and we actually find out that's a real issue that we need to deal with, we won't know that until we engage real cases and real sites. Like Chapman Valve is a perfect example.

I think Jim is right. Here's a case where the philosophy that was intended embedded in this was carried and in what we considered to be a perfectly appropriate approach. In other words we picked the highest value. So the judgment in implementing that procedure at Chapman Valve, what happened was, great, you picked the highest number. You really couldn't have been more conservative.

But there may be other places where the judgment was made in a way that we may not agree. And then we have to ask ourselves the question -- I don't know the answer to this -- if we agree there was a problem on a real case, is the problem because of this procedure? And is there anything we can do in this procedure that would help avoid that problem in the future? So we really can't do much more than that right now.

DR. BEHLING (by Telephone): Let me also add something, and I agree with everything you said, John. Let me make a broad statement. I think with the procedure if it is implemented in the proper way is as good as it's going to get. I fully realize that there are certain deficiencies in past monitoring practice, and certain assumptions have to be applied in those instances.

And my concern only here in writing up some of these issues is that will there be always a reasonable and claimant-favorable approach taken when you end up with a claim for which there is no monitoring data and the potential exists as in bullet number one. The worker was unmonitored and even by today's standards did not need to be monitored. Well, if one could firmly understand that to be a fact, then it's clear what the decision is. Don't bother, just assign environmental exposure and be done with it.

On the other hand, for instance, when I looked at the Paducah Gaseous Diffusion Plant, I realized that early on there was cohort badging. And there were probably many

people who subsequently in 1960 starting on were monitored. And lo and behold, the doses there were actually higher in some instances for people who were previously unmonitored. Therefore, the assumption that we only started to monitoring mostly people who were maximally exposed may or may not have been the truth there, and therefore, you may have in previous years, prior to ’60, not bothered to badge people who should have been badged.

But if, let’s assume that they terminated their employment prior to that moment in time and you left with nothing other than a blank slate that says this person was no monitored, and he may have been labor, what do you do in those instances in trying to give a conservative default value to that person’s dose reconstruction?

DR. WADE: Could I suggest maybe a path forward. I mean, I think there are possibly two actions that result from this. The one I think is that NIOSH should review the tape and make sure that it’s clear in defining what it is and what’s its intentions are. It’s a general guidance document that points you to

some specific TIBs. And if that's the case, fine. If it needs to be crisp up the wording I think that's fine. I think that's appropriate for the subcommittee that reviews dose reconstruction at SC&A to keep an eye on these issues as they review dose reconstructions. And should they find evidence of the fact that there are questions or problems, then they should be raised to subcommittee and dealt with at that level.

MR. SMITH (by Telephone): I guess on that issue of that first action I would point the group to the final sentence of Section One which is the purpose section of this TIB. It's also repeated in the comment response.

MS. MUNN: Can you speak just a little louder and --

DR. WADE: And can you tell us what that sentence --

MR. SMITH (by Telephone): The final sentence on the purpose section states, "This TIB is to be used in conjunction with separate TIBS or other approved documents that provide site-specific coworker data."

DR. ZIEMER: Which is what we

(unintelligible).

MR. SMITH (by Telephone): That may take care of action number one.

MS. MUNN: That's the statement I wanted to hear. I don't know whether that's the statement that SC&A wanted to hear.

DR. WADE: So now we're left with action two.

MS. BEHLING (by Telephone): This is Kathy Behling, and with regard to, I've looked at almost 150 dose reconstructions at this point in time, and we carefully look at all of the information that is being used whether it's coworker data. We review all of the procedures and all of the source documents, most of the source documents that are being used in order to determine if we agree with the assumptions used by NIOSH. So we are definitely looking at any assumptions whether they're 50th percentile assumptions or 95th percentile assumptions with regard to coworker data.

DR. MAURO: Kathy, this is John. In light of that is it your sense that places, I presume that as I recall there are times when

we disagree with the percentile that may have been adopted in a particular dose reconstruction. And in your sense is there anything that could be done to 0020 that might have provided the guidelines that could have made it a little bit more non-subjective? Or do you think that that's not the problem.

In other words when we see that we may have some disagreement on which percentile was used, do you think the problem lies in this OTIB-0020 or is it really something that a judgment, 0020 did everything it could do. The problem really becomes how it was implemented on a particular case.

MS. BEHLING (by Telephone): I guess I have a little bit of difficulty in answering that because as Hans indicated, I have never seen in the cases that I've looked at where they specifically cited OTIB-0020 for the basis for the coworker data.

I have seen cases where they use site-specific coworker data and in those cases up to this point in time, we haven't seen a lot, but so far everything that I've looked at seemed to be reasonable and claimant

favorable. And so I can't really state that I can go back to this OTIB-0020 and indicated that there has been a problem.

DR. WADE: So maybe we have no action items.

MS. MUNN: We have no answer?

DR. WADE: No action items.

MS. MUNN: Oh, thank you. I am interpreting that as agreement that the final sentence we just heard covers the crux of the problem that SC&A has with this issue.

DR. MAURO: What I just heard is that where the rubber meets the road on the real cases we have generally found that the correct judgments were made in terms of what percentile to operate at. And that being the case I'd have to say that, in effect, it means that it validates OTIB-0020. Notwithstanding the fact that there may be some interpretation in ambiguity here that could be improved, but nevertheless at least in the cases that we've looked at, the judgments that were made in the real cases seem to be -- and, Kathy, correct me if I'm wrong -- by and large the correct judgments.

MS. MUNN: Made on the basis of other OTIBs

--

DR. MAURO: Other OTIBs which, of course, ultimately were based on this philosophy.

MS. MUNN: Correct.

MS. BEHLING (by Telephone): What I would say is we have not seen a great deal of cases that have used the coworker models. I think it's just the more recent cases that are starting to use more of the coworker model data. What I've seen so far seems to be reasonable. If there's going to be maybe an action item, I would possibly recommend that during the selection of cases that we review maybe this becomes a selection criteria was coworker data used. And we can look at this issue more closely or at least see more cases that uses coworker model data.

MR. GRIFFON (by Telephone): This is Mark Griffon. I have one question, Wanda. When I'm looking at this, I mean, when I look at the title of this TIB, it looks to be a fairly important document. When I look at the meat of it, I'm not sure it rises to that level.

But my question is I agree with what was said with regard application to the

individual dose reconstruction level, but I'm curious whether this TIB is used by the site profile authors because it seems to really apply to the people that are developing the coworker models up front for the site-specific coworker model.

If you look in Section 6 of the TIB, there's a sentence there which I, you know, I'm very curious about which says that, it's like the third sentence there that says, "A sampling of the data are compared to claim-specific data submitted to NIOSH by the DOE sites," to basically to assess whether the electronic data is usable as a coworker model.

So when I look at this title I'm thinking, okay, this is the criteria by which NIOSH determines whether the data is sufficient and under what circumstances a coworker model can be developed from the data they have for a particular site. And then under what circumstances they'll say it's inadequate or that kind of judgment will be made.

But I don't see many of those sort of triggers in there that tell me, okay, what are

your ground rules. What, you know, is there a certain statistical analysis that you want to do that says if we have, if the data looks like this, we're just going to determine that it's inadequate.

There might be gray areas, but at a certain point we would make a sort of overarching, policy-level criteria that at least the data have to, have to meet these certain criteria to be usable as coworker data or something like that. Or that you have to have a certain amount of information on the employees. You know, do you have sufficient job information or information about where the people would have worked to determine whether a coworker model could be applicable for that site.

And I don't see any of that really in this TIB to tell you the truth. But I guess my one question that I would ask NIOSH is do the site profile authors abide by this TIB? Are they using this TIB in any way to guide them when they develop the coworker models up front?

MR. SHARFI: Look at the site-specific

coworkers TIBs. I believe in almost every case the first reference will this TIB.

MR. GRIFFON (by Telephone): Okay, okay, so they do, and they would abide by that phrase I just read which is to check these data against claim data. Because, I mean, in a few of our SEC reviews I wonder if that has happened.

MR. SMITH (by Telephone): And, Mark, even on Rocky Flats when we were going over OTIB-0058, this was a specific area that was looked at even in the earliest provisions of that TIB, and further work was done on this specific issue. And there's one area that is always addressed in a separate type-specific coworker TIB. You know, Hans mentioned Paducah. I pulled up the Paducah coworker just now, and it's addressing all those items that Hans just brought up on the phone.

MS. MUNN: We do that in the earlier --

MR. GRIFFON (by Telephone): I just thought I'd mention this because all the discussion seems to be around individual dose reconstruction. But I think this TIB's pretty applicable to the site profile development process.

MR. SMITH (by Telephone): Yes, it is.

DR. MAURO: As I recall when we went through the Rocky Flats process, a lot of our discussion centered around OCAS coworker models. In fact, that's most of what we discussed.

Now the question I pose to everyone around the table and on the phone, is there anything that could have been put into this particular OTIB-0020 that would have helped to avoid the months of debate that we encountered? In other words in the end as you recall lots of revisions were made to the Rocky Flats coworker model, whether they were internal or external, I believe that was one of the outcomes that there were changes made in light of the discussions.

And the question then becomes would a lot of that have been somehow avoided if, in fact, more explicit guidance was given. Or in retrospect, never mind then, but in retrospect, now that we've been through the Rocky experience, and we know where the sensitive subjects were, is there anything that could be done to OTIB-0020 in light of

the lessons learned from Rocky and its coworker OTIBS that could be done to 0020 to improve the process.

Maybe in reality, yeah, there might be a problem with this OTIB and the way to determine that is there anything that we could do now that would help avoid similar situations as we encountered on Rocky.

MR. SMITH (by Telephone): My short response to that is no. The methodology used in all of the revisions to OTIB-0058 were the same, and they were always based on OTIB-0020. And again, very claimant-favorable methodologies as you'll see in looking at the final table in that TIB.

MS. MUNN: Extraordinarily favorable.

MR. SMITH (by Telephone): The changes that occurred with OTIB-0058 were due to the repeated revisions of some of the input data coming into the front end of the coworker modeling process.

DR. MAURO: So it wasn't the philosophy. It really was the dataset upon which the OTIB was based. That's an important point.

MS. MUNN: That seems to be the recurring

issue is how well the data available for the various sites can be applied since there's an enormous variation. We've already seen a staggering amount of variation between the amount of information that we have and the application of that information to the site-specific issues that arise. They seem to be very broadly distributed.

Mark, are you okay with the suggestion that the subcommittee sort of check from time to time to assume that OTIB-0020 seems to be applied appropriately to the other sites?

MR. GRIFFON (by Telephone): Yeah, I mean, I think generally it comes up in our site profile reviews and when we cover cases in the subcommittee it will come up that way.

MS. MUNN: If you're comfortable with --

MR. GRIFFON (by Telephone): Yeah, I'm fine with that overall. I would answer John's question in one way thought. I believe, and this is only my feeling, that Section 6 in OTIB-0020 could be -- and I'm just going over this real time as we're on the phone so it's been awhile since I looked at OTIB-0020, but my sense is that some more specificity would

have helped.

And maybe this is in retrospect, you know, after Rocky Flats, but some more specificity as to what it meant or what should be done in terms of, it says, “A sampling of the data are compared,” you know, that hardly tells us much about the sampling. So maybe more specific guidance as to what extent. What’s required as far as a sampling? Is there a percentage? Is there a, you know. How is this sampling done?

MS. MUNN: Well again, Mark, isn’t that going to depend largely on the dataset that you have available to you? That can vary enormously.

MR. GRIFFON (by Telephone): There may be some site-specific issues, but I think overall you want an approach across the board that’s going to be, you know, you want some overall guidance. I would say when developing a coworker model, you should at least include this in your approach to sampling from the claimant data to compare against your coworker data. I don’t know.

That’s just a thought, but otherwise,

Wanda, I agree with you that we can take these up in the subcommittee and site profile reviews when they come for site-specific issues.

MS. MUNN: All right, we can take that as an action item for the subcommittee. As far as your issue with respect that more definitive directions regarding how to proceed with sampling, I ask NIOSH if they have views on that that they would share with us.

MR. HINNEFELD: I guess not sitting here at the table. We'd have to consult with the people who have been preparing these, you know, the coworker datasets and some of that and just see what exactly are we talking about.

MR. GRIFFON (by Telephone): I know some of it's a case by case, but I think from the standpoint of having to come, you know, think of down the line when you're going to have to defend this coworker model what general criteria do you want to be able to meet I think is kind of the way I'm looking at it. You know, but this is what we do for every coworker model we develop.

And then there's going to be variations as Wanda said. Every set of data's going to be different and every site's different. I understand that. But maybe it's worth spelling some of those out in this general guidance that this is what we look to achieve in every one of these.

MS. MUNN: So can we go away from this item with two specific action items? One for the subcommittee to incorporate this into what we're looking at there. The other for NIOSH to check the wording of Section 6 of the OTIB to see if there should be more specificity to the direction with respect to sampling of data. Is that fair?

MR. GRIFFON (by Telephone): Sounds okay, yeah.

DR. WADE: I've got the two action items captured.

MS. MUNN: Very good. We're all exhausted. It's time for a 15-minute break. Please do, 15 minutes.

(Whereupon, a break was taken from 11:00 a.m. until 11:15 a.m.)

DR. WADE: We're back in session. Mark, are

you with us?

(no response)

DR. WADE: Mark Griffon?

(no response)

DR. WADE: Mark, are you on mute?

(no response)

DR. WADE: Mark, if you are not on mute where are you? He'll be with us shortly.

MS. MUNN: I hope so. In his absence our 15 minutes is up. Let's return to our summary of tasks three Supplement one, Rev. one.

The next item I see that has any ones in the rating column that have any kind of response is on page 24 of 37. ORAU PROC-0022.

DR. MAURO: I'm sorry. This is John. Right now I'm looking at my chart --

DR. ZIEMER: OTIB-0017.

DR. MAURO: OTIB-0017 on page 11?

MR. HINNEFELD: It has no NIOSH response.

DR. MAURO: But there's no response, okay. So we don't want to go there then.

MS. MUNN: No, not right now. We'll touch on it to see how the responses are coming after we've gone over the responses we already have. If we can get anything whittled down so

that it comes off this matrix, or it's reduced to at least one item on the matrix, it will be --

DR. MAURO: I'm sorry. You were saying that the next place is where?

MR. SMITH (by Telephone): Page 24.

MS. MUNN: PROC-0022, reference to the ORAU procedure for our Privacy Act compliance. There are two separate findings there, and we had responses from NIOSH.

Stu, do you want to review your response to see how SC&A accepts it?

MR. HINNEFELD: This is a procedure is for requesting additional information, and I think that would be utilized when we get late information like we have a claim about employment like at a DOE site or visits to other DOE sites that were not part of the original claim. I'm trying to catch up here again.

The first finding has to do with reference an incorrect procedure maybe.

MS. MUNN: Refers to the ORAU procedure for Privacy Act compliance. Needs to be correct and consistent. And the next one suggests

that PROC-0022 provide an overview for requesting information as referred to task two, task four, task five, assumes the reader's familiar with each task.

DR. ZIEMER: I'm a little confused here. The rating column has disappeared from my chart.

MS. BEHLING (by Telephone): This is Kathy Behling. Yes, when we get into the quality assurance procedures which is where you are right now, in fact, I think Steve Ostrow is on the phone and he can help me out here. We developed a checklist that's different than the checklist for some of the PROCs. The quality assurance checklist simply has, it asks questions and the response is either yes, no or not applicable, and there's no ranking or rating associated with those. So therefore, quite honestly I'm trying to think back as to why there was a one in parentheses behind this --

MS. MUNN: Well, I know why it was. That's from our discussion previously that you mean that's from Supplement One. That's the first supplement.

Sorry, that's my, I was looking in the wrong column, too.

MS. BEHLING (by Telephone): Yeah, these quality assurance procedures do not have rankings.

MS. MUNN: We're not going to look at those then at this moment. I need to backpedal myself.

I have listed PROC-0061, OTIB-0028. It's OTIB-0028 --

DR. ZIEMER: It's the same issue. I think it's the version rating.

MS. MUNN: We had ones on 24, but there was no response yet. That's in preparation. We had, 28 has responses to it. They had low ratings.

DR. MAURO: All of these are QA. Here we are starting on page 24, for example, may have started earlier. Let me see if I can find where it actually starts. Page 22.

MS. MUNN: Yeah, I've moved this back. I'm back on page 13. I'm sorry about that. I jumped us ahead into the quality procedures. I'm back where we do have rankings and responses. As I said earlier, I want to make

sure we do get an opportunity to look at the NIOSH response regardless of the classification and to make sure that if there's a resolution that we can reach here today that we do that.

As I see it, the next response that I have is on page 13 for OTIB-0028. The summary ratings were four and four, but we do have a response from NIOSH. It says a page change is going to be initiated, will include all the files used. Can we assume that that meets the criteria anticipated from SC&A?

DR. MAURO: I'm just getting myself a little oriented here. These are the ones I believe that were prepared, there are several here by Joyce. The one we're looking at has to do with thorium. Is that correct?

MS. MUNN: Yes, Type M Thorium.

DR. MAURO: Right and the question --

MS. BRACKETT (by Telephone): This is Liz Brackett. This OTIB was written because the values in IMBA are not correct because it carries all the daughters through with it so we had to come up with alternative dose conversion factors. And this OTIB was

verification that the number that we were using. And I somehow missed, I only listed two of the files when there were actually four of them. That was one of the problems.

DR. MAURO: It turns out our comment on what I call, there are three in a row, one dealing with thoron, one dealing with thorium and one dealing with wounds. These were all reviewed by Joyce. All of which got very favorable reviews. There were no ones, twos, I believe they're only threes. But there was some general observations.

And I believe what you're referring to is there were certain references. I believe the one you're referring to is there are certain documents that Keith Eckerman provided that were the underpinning for the approach used. And Joyce said from her review everything looked fine, but she'd sure like to look at those original source documents that Keith Eckerman used to come up with the dose conversion factors, but she didn't have any problem with it. They looked like they were valid, but it would be helpful if we could see those source documents. I think that was the

extent of the comment.

MS. MUNN: So a page change including the lifting of the file will meet your criteria?

DR. MAURO: Yes.

MR. HINNEFELD: Well, I can do that. Do you want to see the files as well?

DR. MAURO: Well, yeah, that's what Joyce asked for.

MR. HINNEFELD: Liz, if you would send those to me, I will send them on to John.

MS. BRACKETT (by Telephone): Okay, thanks.

DR. WADE: What files are they exactly?

MS. BRACKETT (by Telephone): These are files that Keith Eckerman generated from the software that he uses to drive the dose conversion factors. It's the output from his program.

DR. WADE: Could I have his name again?

DR. ZIEMER: Keith Eckerman.

MS. BRACKETT (by Telephone): ORNL.

MS. MUNN: All right, so our only expectation will be that page change and this item will then clear.

MR. HINNEFELD: The page change and the files.

MS. MUNN: Right.

There is the third item on OTIB-0028 on the next page --

DR. MAURO: What page number? I'm sorry.

MS. MUNN: Just the very next page. There are three items on OTIB-0028. The first two are on page 13, the next one is on page 14.

It says what should be used when it's an intake of 232 or 238 and that's different from five. And the response is ORAU's not aware of a different ever being applied. If needed we will contact Eckerman. Is that adequate for the issue?

DR. MAURO: Yes.

MS. MUNN: The next response we have is down that same page on OTIB-0011. We have two items there with responses to them. Sounds as though NIOSH is asking for clarification --

DR. MAURO: Perhaps I can help on these two items. This had to do with tritium bioassay and individuals that would be working in an area where they're exposed to tritium, and there were some intermittent bioassay samples collected that might have been spaced by many, many months. So in theory the person could

have been working in the tritium environment and the clearance for the tritium I think has a ten day half life. So in theory if you don't take sufficient bioassays, you could miss an intake.

And the first comment had to do, and it's a four. It wasn't a very major, was that it wasn't clear how do you deal with a void. And I believe the comment was very simple. It became clear when we read the workbook. In other words there's a workbook that goes with this one.

And when we saw the workbook, the workbook provided very explicit guidance, exactly what do you do when you have a void in the sampling sequence. But it wasn't until we read the workbook that we realized everything's okay. So that's why it was a four. It would be helpful if the actual procedure, the OTIB, provided that explanation in the text that you wouldn't gave to go through the workbook before you understood exactly that everything's okay. That was the comment that was made. So it's a relatively minor comment.

MR. HINNEFELD: Well, there is some language in the section called time periods with no monitoring. So there is something there. I guess it wasn't sufficiently clear.

DR. ZIEMER: The response, the ORAU response, appears to address it.

MR. HINNEFELD: There is some wording there, and maybe since the workbook is clear and there's some wording there, maybe that's sufficient.

DR. MAURO: That's why it was a four and maybe we missed it.

MS. MUNN: We're okay?

DR. MAURO: Yes.

MS. MUNN: We're okay, those two.

DR. ZIEMER: Do you need to double check that, John?

DR. MAURO: I'll go back and take a look, sure. Make sure that the words are there and sufficient. But quite frankly, as long as it's in the workbook, in fact, let's talk about this a bit.

If the workbook is fine but maybe the procedure is not as thorough, in other words, the workbook has to be complete because it's

mechanistic; it's all there. And there maybe, so there's information in the workbook is always richer and more explicit than what's in the text of the OTIB by the very nature of the workbook. So in my mind I like the idea, may it would make life easier for everyone, is they complement each other, and they're really part and parcel of the same thing. That is, the write up together with the workbook constitutes the procedure. And if we look at it that way, then there really is no comment because, you know, when we did this review, we actually, we looked at them as if they were separate. But maybe the better way to think about it is this. These complement each other. And if there is any ambiguity in the actual text of the OTIB that's resolved in the workbook. As far as I'm concerned the problem goes away. I don't know if the rest of the working group would agree with that interpretation.

MS. MUNN: I understood that to be the philosophy at the time we put the workbooks together but perhaps I was in error. Do we have any heartburn with that philosophy?

(no response)

MS. MUNN: If not, then --

DR. ZIEMER: Now I'm wondering if maybe the reviewer, maybe your reviewer wasn't aware of this later section and made the comment in --

DR. MAURO: Well, I'll --

MS. MUNN: The next item is the one immediately below it, also a four. ORAU OTIB-0019.

MS. BRACKETT (by Telephone): Do we still want another one associated with 11? I don't know if you want to finish that.

DR. ZIEMER: She's talking about that one, Liz.

MS. BRACKETT (by Telephone): Oh, she just said 19. I'm sorry.

DR. ZIEMER: You meant 11, didn't you?

MS. MUNN: Yes.

DR. ZIEMER: It's a tritium one.

MS. MUNN: Yeah, I meant 11.

DR. MAURO: I think the issue here has to do with the modeling. That is when tritium is taken into the body and then it shows up in the urine, there is this delay period. And the comment was I believe that that delay is

not explicitly taken into consideration. But the response, and I will stand corrected by the folks who are expects on the ICRP model is that it assumes instantaneous mixing deliberately. And so that's the way ICRP intended it to be in spite of the fact there is this delay intake and when it gets to the urine. So as long as everyone, that's the ICRP. I wasn't aware of this. This was explained to me. As long as the ICRP model assumes instantaneous mixing and so your intaking a -- You're assuming it's in the urine, that's not a problem with the model. And ICRP did it this way. Please, anyone more familiar with this subject than I am, correct me if that --

DR. ANIGSTEIN (by Telephone): This is Bob Anigstein. I'm not sure if I understood your comment correctly. Did you say that there is instantaneous mixing throughout the body?

DR. MAURO: Yes.

DR. ANIGSTEIN (by Telephone): Oh, this is for tritium only.

DR. MAURO: Tritium only.

DR. ANIGSTEIN (by Telephone): Okay, forget

it, sorry.

DR. ZIEMER: And you're not saying that there is. You're saying that the model assumes that there is.

DR. MAURO: In reality there is.

DR. ZIEMER: It only matters if somehow you collected a urine sample the first minute after an intake.

DR. MAURO: Right.

MS. BRACKETT (by Telephone): Or, well, if you collected it within two hours.

DR. ZIEMER: All right, two hours.

MS. BRACKETT (by Telephone): It's not going to have an impact on the dose calculation, but it will --

DR. MAURO: That's why it's a five. In other words it's got a five. It was a comment, an observation that the reviewer wanted to just point out and alert quite frankly. It's unfortunate that it surfaced to this degree. I don't think that it's important. So I don't think we need to go any further.

MS. MUNN: The next response we have is to OTIB-0019. It was rated a four.

DR. MAURO: Bob Anigstein, are you on the line?

DR. ANIGSTEIN (by Telephone): Sure am.

DR. MAURO: I believe this is the one we talked about this morning or yesterday.

DR. ANIGSTEIN (by Telephone): Yes, yes. OTIB-0019 actually falls into a very similar category to OTIB-0020 which we discussed at length earlier in terms of that it's a guidance. It's not really a guidance to the dose reconstructors as I understand it. It's a guidance to the site expert to create a separate TIB for each site which then will be used by the dose reconstructors.

MS. BRACKETT (by Telephone): Yes, that's correct.

DR. ANIGSTEIN (by Telephone): The problem we had -- just one second. The issue with the OTIB-0019 is that it gives a very straightforward methodology for taking the known data, the coworker data, and assigning to each data point, assigning it a percentile. You simply rank them.

And the example they give is let's say you have ten data points. Then the lowest

value is given point 0.05 because 0.05 is halfway between zero and 0.1. So it gets a five percentile. The second one would get a 15 percentile and so on up to the tenth which would have a 95th percentile. And, of course, if you have more data points you use a similar but finer gradation.

Then the OTIB instructs that these get plotted. Each one of these percentiles gets assigned a Z score. So by definition the 50th percentile gets a Z score of zero, and as a result of a normal distribution, the 84th percentile will have a Z score of 1 because that's one sigma, and all the others will have corresponding Z scores.

Then there is, I use something like Excel which probably people would normally use, to do a regression analysis, and you plot the best line, the best straight line through those points. And then from that line you would have two parameters, and one would be the 50th percentile would come out of that line. And the other one would be the slope of the line would be the geometric standard deviation. So all of this is straightforward

statistics, and it was originally reviewed by Dr. Harry Chlmynski who has a doctorate in statistics. And he found the statistics to be fine.

The point we did object to is it then goes on to say, well, make sure that it's a lognormal distribution because what you plot is the logarithms of the values of the doses, the doses or intakes. And to make sure it's a lognormal distribution, you calculate the R squared. And normally, in ordinary statistics when you have two independent, you have a measurement that has two values attached to it, two independent variables.

And you then do an R squared to determine the amount of correlation between these two variables. And if you have an R square of 0.9, that's considered a good correlation. If you have an R square of 0.7, it's reasonable and probably valid, acceptable.

That does not apply in this instance because you already have guaranteed that regardless of the form of the distribution by ranking the values and assigning a Z score to

each value, you've already guaranteed that there will be a monotonically increase in function. Meaning that each, any time you have value K, and then you have value K plus one, the value will be higher, and it will also have a higher Z score.

So whether there's a straight line or not, you'll always have this curve that starts at the bottom left and goes to the top right. So you will always get a good R square even -- and Harry Chlmynski quotes some papers and the discussion this morning -- that they made up some perfectly arbitrary distributions, and they always get an R square of 0.98. That's the authors of this work that refers to. So this is simply not a valid test on whether or not you have a lognormal distribution.

There are other tests. There's a number of statistical tests that can be applied to determine how likely it is that a distribution is lognormal, but they are not mentioned here in this OTIB. So that's the brunt of the criticism.

And then the nature of the outcome is that if you're trying to take, say, the 95th

percentile of that from the distribution as opposed to the real 95th percentile, meaning that you had a hundred values, then the 95th percentile would be the 95th value starting from the bottom, you might get very different values if the thing sufficiently deviates from lognormal. It even has a high-end tail. So that's our objection to this.

MS. BRACKETT (by Telephone): But there is another test that isn't documented in the OTIB where we do, the information that's included on the spreadsheet that comes out of this, there's the fitted 50th and 84th percentiles, and there's the actual, you know, looking at the ranking to look at a comparison of them to see if they are very different.

DR. ANIGSTEIN (by Telephone): Yes, I noticed that. That they do, that it does specify, as a matter of fact, it doesn't even, the OTIB does not make clear. Thus, it does give you two different ways of calculating the 84th percentile and the GSD which was the ratio of the two. And it's not clear to the reader why there are two different ways, but as you explained, that should be, one with inside

knowledge would know, yeah, that must be what they're doing. But that should be made clearer in the OTIB, I think.

MS. BRACKETT (by Telephone): There is a procedure that gives more details of doing the calculations, Procedure 95, that was written kind of a sub-document to this one that gives the person running the statistics the specific details of how to do it. I'm not sure if that's covered in there, but that does go along with this and does give more detail.

DR. ANIGSTEIN (by Telephone): I see. Okay, that's good to know. I do not believe we reviewed that procedure.

MS. BRACKETT (by Telephone): It came a bit after this one.

DR. ANIGSTEIN (by Telephone): I see. Okay, that would explain it.

MS. MUNN: So what is our action here? Is someone going to verify that the follow-on procedure, that was the issue?

MS. BRACKETT (by Telephone): It won't settle the issue because it doesn't address other, it doesn't address any other tests. It just does give a little more information about

how the statistics are run.

DR. ZIEMER: Liz, is that procedure the one called Generating Summary Statistics for Coworker Bioassay Data?

MS. BRACKETT (by Telephone): That sounds like the right title, yes.

DR. ANIGSTEIN (by Telephone): I mean, as a sort of a lay statistician I would just mention that there's something called a W test which is one that can be applied to determine lognormality, and there are several others.

DR. NETON: There's also the Kolmogrov Smirnov test.

DR. ANIGSTEIN (by Telephone): Yes.

DR. NETON: It seems to me we need to go back and just look at this again, and in light of what Bob just talked about with the R squared values.

MS. BRACKETT (by Telephone): Sure. One thing I will mention is we've discussed many times what would be the alternative to lognormal. This is to determine if it's a lognormal, but we haven't really come up with any better alternative to what it could be. Because then if you determine it's a different

distribution, then you have the issue of how you enter the output into IREP since it only has a limited number of distributions.

MS. MUNN: Can we have an offline discussion of our technical people to see if you can resolve this?

MS. BRACKETT (by Telephone): Sure.

MS. MUNN: And report back to us at our next meeting. It would be very nice if the two of you could resolve whether there is, indeed, a problem or whether it is taken care of and just not obvious to the casual reader. I'll expect a report back at our next meeting. Okay? Can you do that?

DR. ANIGSTEIN (by Telephone): Fine by me.

MS. BRACKETT (by Telephone): Who's making the report?

MR. HINNEFELD: We will. We'll task around the program.

MS. BRACKETT (by Telephone): Okay.

MS. MUNN: Thank you.

DR. ANIGSTEIN (by Telephone): Excuse me. I didn't get the name of the lady who had just discussed the statistics.

MS. BRACKETT (by Telephone): This is Liz

Brackett with the O-R-A-U team.

DR. ANIGSTEIN (by Telephone): Liz Brackett.

MS. MUNN: The next response that we have has a rating of three, ORAU OTIB-0033, and we have a NIOSH response. The OTIB was developed to give guidance to the judgment the DRs must document their rationale for selected categories based on information in the worker's file. Is that acceptable to SC&A?

DR. MAURO: To step back a little bit on OTIB-0033. What this is is, unfortunately, this is part and parcel to a bigger score. It has to do with coming up with, when you don't have adequate bioassay data, and you don't have sufficient air sampling data, but you do have a Health Physics program in place whereby the DOE order is in effect. You've identified different sections of a facility that radioactively contaminated area, airborne contamination area where you have a degree of control over access to areas with airborne radioactivity.

That's the setting. That is, that we're in a situation where you have in place a well documented radiation protection program.

Now stay with me for a minute. The idea here is, I think this is an important issue because it goes to the fundamental approach for creating surrogate data or surrogate approach to doing dose reconstruction where when you have very limited information about the exposure a worker may have experienced -- and certainly if I'm mischaracterizing it, help me out -- but and so what happens as follows.

So we have a facility that has a robust radiation protection program, then a degree of confidence that access to areas with elevated airborne radioactivity is controlled. Under those circumstances one could argue that it's very unlikely that anyone working at that facility will have entered an area for protracted periods of time where the concentration of the radioactivity in the air is above the maximum physical concentrations, the MPCs. So that's a given as we have this control in place.

Now, one could argue that, all right, if we want to place, here we have a worker. We want to place on upper bound on what he might have inhaled. We have a lot of options.

We say, listen, one of the things we can do, we don't have any bioassay data for him, but one thing we can say with a high degree of confidence is that because he worked for this facility at a time when there was a robust radiation protection program, there's no way he was exposed 2,000 hours per year to radionuclides at a level in the air that were above one MPC for the worst radionuclide, like Strontium-90. So that sort of puts a lid on it. That sort of sets the stage. That's OTIB-0018 by the way.

Then you said, well, hold it. Hold it. So we're not going to assume that a worker was exposed 2,000 hours per year at an MPC of the worst possible radionuclide. We've got to find a way to tone it down to make it a little bit more realistic so that we can make decisions regarding compensation and denial on a more realistic basis. And that's where 33 comes in.

Thirty-three comes in and says, well listen, this is what we're going to do. Depending on the year and a number of other parameters that characterize this person's job

function and the years in which he worked, we'll assume that he's at some percentile of an MPC of exposure. That is maybe ten percent of an MPC or five percent of an MPC.

So there's an overall strategy that's adopted here that brings you to a place that says even though we don't have bioassay data for this particular worker, we probably can place a plausible upper bound on what he may have chronically been exposed to while working at this facility at this time. And it effectively means that we'll take the MPC to the worst radionuclide he might have been exposed to, and then, depending on a number of parameters related to his job function and the year that he worked, we're going to assume he's at some percentile of the MPC and then do a dose calculation.

Now, the criticism that we had related to this is there's a lot of judgment here, and not only that, it's confounded by some of the criticisms we have with OTIB-0018. So it's hard for us to discuss OTIB-0033 in a vacuum because OTIB-0033, all it really says is, well, apply this adjustment factor to OTIB-

0018, you know, the MPC, under these circumstances or use this adjustment factor.

So our concern, and this is one way perhaps to really get our arms around a multiple set of OTIBs. The whole idea that doses can be reconstructed for workers without any bioassay data based on a premise that there was a radiation protection program under DOE Order 15, whatever the DOE Order is. And thereby there's assurance that their access controls were there. And then given that, that in itself is, there's some questions that we should discuss.

But then superimposed on that is the, what I consider to be, the somewhat arbitrary selection of adjustment factors like 0.1 or 0.5 of an MPC based on a variety of parameters that one could assign to that worker. And so our concern goes toward that. That is, there's an awful lot of judgment. There's an awful lot of presumptions embedded in what I call the OTIB-0018-slash-OTIB-0033 strategy for reconstructing internal doses.

And I guess I'd have to put it back out to NIOSH whether or not I've accurately

characterized that combo of OTIBs and your sense on whether or not that is, in fact, a weakness that you see also.

MS. BEHLING (by Telephone): Excuse me, John. Can I just add to some things that you said?

DR. MAURO: Please, yes.

MS. BEHLING (by Telephone): I'd just like to make it very clear to the work group. OTIB-0033, as you indicated, applies a graded approach to the OTIB-0018. And OTIB-0018 is an overestimating approach that was designed to replace or that is used, in fact, quite often right now, OTIB-0002. And OTIB-0002, the difference now is OTIB-0002, you were not allowed to compensate using OTIB-0002. But the combination of OTIB-0033, this graded approach along with the OTIB-0018 does allow that dose reconstructor to compensate a case.

MS. BRACKETT (by Telephone): That's not correct.

MS. BEHLING (by Telephone): Okay.

MS. BRACKETT (by Telephone): It's still an overestimating technique, and it's not intended to use for compensable cases.

MS. BEHLING (by Telephone): Thirty-three is not?

MS. BRACKETT (by Telephone): No.

MS. BEHLING (by Telephone): Because the title of 33 I thought is Assumption for Processing Best Estimate Cases, but it's still not to be used for compensating? Is that correct?

MS. BRACKETT (by Telephone): Well, that's a good point because it brings in OTIB-0014 also, which can be used for best estimates. But the overestimating assumptions are still not to be used for compensable cases. It was written during the time where for a short time we were doing compensable cases based on these types of things, but that's not the case now.

MS. BEHLING (by Telephone): Okay, because I have seen cases where they've applied, and I was under the impression that the OTIB-0033, once you apply that graded approach, you could compensate because I have to go back and convince myself that I was quite sure that we'd seen some cases where there have been compensations using OTIB-0033.

MS. BRACKETT (by Telephone): Well, as I

said, when it was first written there was a short time when that was being done, but that should not be the case now. That's not the intent of it.

MS. BEHLING (by Telephone): Okay, maybe that should be something that's clearly stated in this OTIB-0033 at this point.

DR. MAURO: That's important. Our understanding, and even I think the language, in 33 was, that was the reason why 33 was written so that you would not, that you had a way to reconstruct doses a little bit more realistically and compensate or deny --

DR. ZIEMER: It does have best estimate in the title.

DR. MAURO: Yeah, so I guess that needs to be fixed. If, in fact, 33 in combination with 18 is, in fact, being used as an upper bound for denial only, that's very much different than our understanding.

MS. MUNN: How can we fix it?

MR. HINNEFELD: Well, there might be two things to fix here. One is to sort out the debate and, if necessary, change the title on this OTIB. If it's strictly an overestimating

OTIB, it shouldn't have this in the title. I think there may be some historical explanation. I think I might know what the history is or why this was used in compensating cases. But I want to make sure I get it right so I'll do that.

And then the other issue may be a broader discussion of the combination of 18 and 33 and what ever, you know, take a look at the combined issues on those and see what we can do in terms of a combined response and why we believe the approach is a good approach. I mean, that might be the other thing to do.

MS. MUNN: So you're going to do a two-pronged review. One to see whether changes need to be made directly to 33, and also to verify that it is being property incorporated into the overall activity of dose reconstruction.

MR. HINNEFELD: Well, in combination with 18 what we want to do is take the finding, review 18 as well. Review the findings for 18 and review the findings for 33 and see what we can come up with in terms of a consistent response.

DR. MAURO: And within that context we had a much more serious (unintelligible) 18 than we did with 33. In other words, 33 there was this adjustment factors which you could say were reasonable, you know, applying this adjustment. Because people aren't going to be exposed to the MPC, but it's hard to escape 18. Because, see, 18 is interesting.

It says that, listen, we have a general air sampling so that we know what the airborne radioactivity is in different areas in the plant. And on that basis we could say with a high level of confidence that if a person, you know, a person's not going to be allowed to enter an area with concentrations in air that approach or exceed.

In fact, in recent times I believe respiratory protection is required when you're ten percent of the MPCs. So in recent times it's not going to happen. But our problem, and you'll see we're sort of crossing into 18 but you can't help but do it, is that general air samplers, we are finding that there's no, there's very little relationship between the Becquerels per cubic meter you get off of

general air sampler and the Becquerels per cubic meter that you get off a lapel.

And therefore, we question whether or not you could even use OTIB-0018's data that you would get from a general air sampler as a reliable indicator of what a person's exposure might be. And Hans has done some research on this, and when we get to 18, you'll see that -- I think this is an important concept -- general air samplers have very serious limitations when it comes to dose reconstruction, and we the information in the review of 18 in this very document we're looking at now.

And I think that is a very important subject that needs to be discussed. Now whether you want to do that now or when we get to it, but they're linked. The two are linked and 18 really is where we have the greatest concern, more than we have with 33.

MS. MUNN: We established NIOSH is going to look at it and see how the two mesh so we'll expect that report as well.

The next response we have is not even rated, but it has responses for OTIB-004. Was

whether to allow further reassignment of the parameters not available.

MR. HINNEFELD: This is a question about the use of breathing rate. You know, 1.2 is kind of what's normally used in calculating, in using breathing rate. So the question is does a person breathe hard for eight hours a day and includes some portion of heavy breathing and some portion of that. So that's incorporated. Some amount of heavy breathing is incorporated into the one-two meter.

DR. MAURO: I don't know if it was given a score.

MS. MUNN: No, it doesn't have a score.

DR. MAURO: There may be a five here. In other words this --

MS. MUNN: Well, we have a whole gaggle of comments on OTIB-004, and since we have a half dozen, actually seven, eight, nine, ten, we have ten comments on four. And it would be very nice if we could take a moment, read through NIOSH's response and see if they're adequate for the concerns that were raised when the findings were first put forward. Let's take a moment to take a look at those.

DR. ZIEMER: And the reason these weren't rated is?

DR. MAURO: I'm trying to find it.

Kathy, by any chance -- I'm just trying to find the page number so I can take another look at four because I was part of the review team.

MS. MUNN: It's on 15.

DR. ZIEMER: In their report it's pages 138 to 40.

MS. MUNN: Thirty-seven, 38 and all the way down to 45. So there's ten pages of report data.

(Whereupon, the work group reviewed the report.)

MS. MUNN: So can we address and agree on any of these?

DR. MAURO: Yeah, I can go through them now. I was trying to get myself re-oriented. Mark's found them and Mark's found them pretty quickly.

We'll start with the very first one on page 15, the third row down. This has to do with the breathing rate. We've been having this discussion on breathing rates for quite

some time. We recognize that 1.2 cubic meters per hour is the recommended and ICRP.

However, at the same time one of the concerns that we raised -- and this came up on a number of occasions when we deal with AWE facilities -- and OTIB 004 is basically dealing with uranium facilities. Where our understanding is, this is pretty hefty, heavy-duty work. They've lifting, moving uranium logs and billets and rolling. So I guess this is a general observation regarding that class of work.

AWE facilities that are doing uranium metal working. The physical activity is intense and so as a general comment whether or not that default assumption is, in fact, a good one when it comes to this class of workers. That's the concern. I think it came up before. On Bethlehem Steel I think we went with 1.7 cubic meters. Now whether or not you want to make it universal, that was our concern.

DR. NETON: I think what happens here though, how much of an overestimate do you want. This is an overestimating technique.

We've already acknowledged this is an upper bound exposure, upper bound chronic exposure that requires an overestimate. How many layers does one want to put on top of these already overly estimating techniques.

DR. MAURO: Let's step back. What OTIB-004 does, the really important heart of it, is what you want to do is you want to place an upper bound on what AWE worker might experience for the purpose of denial. I believe that's still the case. And when all is said and done what's done is they reviewed the literature on AWE facilities and how much uranium is in the air.

And they said, well, you know, looks like chronic exposure at 100 MAC is an upper bound, and we agreed with that. That's a good number. So I don't want to leave the impression that we didn't have a serious problem with this one. The commentaries are almost like what I would say, by the way, you may want to take a look at this. So with regard to inhalation though, 100 MAC we consider to be a solid value.

The other thing that's, that's very

important in OTIB-004 is that we're worried about external exposure. And what was done there is that they were assuming that, okay, here we have an ingot of uranium. And we're going to assume a person is standing one foot away from it 2000 hours per year. As far as we're concerned that is off the charts.

So I want to make sure that everyone here understands that when it comes to the two fundamental pathways by which workers are exposed. That is airborne dust floating during the uranium metalworking operation and the external exposure from being working adjacent to uranium. The methods used in OTIB-004 we consider to be valid.

Now we have the second order, that are commentaries. Given that context we can quickly go through, the first one had to do with the breathing rate. Jim, I hear what you're saying and I understand, and I have no problem with that.

DR. NETON: Probably just a little more because if you think about these 100 MAC values, it's more than likely these are already at the 95th percentile of a possible

range --

DR. MAURO: In fact, we did an analysis. It's about the 90th percentile.

DR. NETON: It's in the upper range. So if then if one is superimposed on top of that what we consider the best estimate of their inhalation. We've got this range of values of huge, I mean, way out there in the number of standard deviations involved with probably what would be the best estimate. When you look at it in that context these other modifiers are trivial corrections, John, in the overall --

DR. MAURO: I agree with you.

DR. NETON: If you go from 1.2 to 1.7 to modify the oronasal breathing pattern. The second order correction on something that's already been out there.

DR. MAURO: I agree with you.

But there are places where we do have some concerns on OTIB-004. Some are more important than others. One has to do with the recycled uranium. Embedded in OTIB-004 is, okay, at some of these facilities I'm going to have recycled uranium after 1952 or '53,

whatever the date is.

And again, we didn't give this a high rate, but the basis for the recycled uranium composition. Parts per million is not cited. I believe there was limited discussion, and I can see by your response you're currently looking at that. That is, I could see.

We leave the breathing area and go down, I guess, toward the bottom of the page. I see an OTIB on recycled uranium is currently under development. So I guess what I'm hearing is that any questions we have related to the basis for the value selected in OTIB-004 as a default composition of recycled uranium. The basis for this is under development or has been developed since we did this review. That may be the case.

MR. HINNEFELD: It is under development.

DR. MAURO: It is under development. So that's where we are on that. Since it's under development I guess then the question becomes once that's done there needs to be a level of assurance that, yes, the values in OTIB-004 are, in fact, compatible and consistent with what one would consider to be an upper bound.

I told Jeff I recently looked at some of the plutonium recycled numbers on ten parts per billion. In other words, no AWE facility ever received any uranium that was greater than, I believe, ten parts per billion of uranium. That was sort of like a spec. Now that's not with Paducah or anything like that but AWE's that big metalworking. And so I've since learned that. Now I haven't gone back to check to see if that's the number you have here.

MR. HINNEFELD: I don't even know.

DR. MAKHIJANI: But 10 ppb is in TIB-004, but I have a question. Was TIB-004 restricted to metalworking only and not the chemical facilities where you might have had the raffinate problems and concentrations and out-of-spec plutonium?

MR. HINNEFELD: It was at one time. Joe Guido's on the line. He might be able to shed some more light on this.

MR. GUIDO (by Telephone): Yeah, we're not the, there's uranium ore raffinates that's not being used.

DR. MAKHIJANI: No, no, it wasn't about ore

raffinates, but would it be --

MR. GUIDO (by Telephone): Uranium ore or raffinates?

DR. MAKHIJANI: Would it be used at some facility where any chemical processing of uranium was happening? Any for other than metal was present?

MR. GUIDO (by Telephone): There's a matrix in the back of OTIB-004 that shows the facilities, and it's applicable to, and we can look through those and see. I'm not sure what you mean by other processing.

DR. NETON: It must have been. It had to be pure uranium I think because otherwise the 100 MAC for uranium wouldn't apply because, you're right.

MR. GUIDO (by Telephone): It's a uranium facility, but I'm not sure --

DR. MAKHIJANI: I don't know these well enough to be able to say --

MR. GUIDO (by Telephone): -- uranium metal facilities --

DR. MAURO: Well, I can say this. When I reviewed the literature that stands behind the 100 MAC, amongst the literature was, for

example, Harshaw Chemical Company which did have levels well above 100 MAC, and Harshaw was refining uranium. In other words it wasn't limited to just metalworking. So it wouldn't be bounding.

DR. NETON: We kind of looked at these. There was an upper tier called the Big Five or Seven. And there were a number, and they were big producers, Mallinckrodt, Harshaw, but we know immediately below there was a whole second tier that didn't fall under that category at all, and that's where the intent --

DR. MAURO: And within that context I would agree that 100 MAC is the right number, but --

DR. NETON: They're higher than 100 MAC air.

DR. MAURO: But this time we have an average now.

MR. SHARFI: But Harshaw's not one of the listed sites.

DR. NETON: It's not. It wouldn't be. I think it's even discussed somewhere in that TIB that the rationale was that they were second tier, called mom and pops, minor players in the uranium cycle there. It would

apply to the original producers.

DR. MAURO: That was my understanding also when I looked at it, and that's why I came down with 100 MAC as being certainly a reasonable upper bound for the purpose of denial.

So to go back, we're up to the part of the bottom of page 15 dealing with recycled uranium. And the bottom line on that is as long as, the way we see it, as long as the selected values in OTIB-004 for default do, in fact, represent a plausible upper bound, a lot might be contained in the recycled uranium at metalworking facilities. That's fine because right now when I looked at it, I wasn't able to make that judgment. Since doing this review which was, I believe, about a year ago, I have learned a bit about recycled uranium. And I guess the question is if they used ten parts per billion of it, that's probably the right number. So that solves that. So maybe we solved the problem. It's covered. Ten parts per billion. Now I don't know about the others. I don't remember the neptuniums and the techniciums where they came in. But

plutonium was always the driver anyway because we're dealing with the inhalation pathway here.

DR. MAKHIJANI: Well, that's not entirely true, John. And neptunium could be sometimes. It depends on the circumstances. Would that be right in your experience?

DR. MAURO: Yeah, okay.

DR. NETON: It's not a huge dose contribution. We limited it to ten parts per billion. I think it's what, like ten percent of the total dose or something like that.

DR. MAKHIJANI: That's correct.

DR. NETON: That was the basis for that ten parts per billion.

MR. GUIDO (by Telephone): This is Joe. The numbers in there is based on ten ppb Plutonium-239. It's in Table 3-1. It gives you the ppb and the fraction.

MS. MUNN: So to try to wrap this up the only real outstanding issues of major significance of 004 have to do with TIB-0053 currently under development. When that occurs, when that's done, do you have any feel at all for what the timeline looks like?

MR. HINNEFELD: I don't, no.

MS. MUNN: When OTIB-0053 is done, it will be made available to all of us, and SC&A will take a look at it to see if it resolves the issues that we have listed here, all of them with respect to TIB-004. Is that the correct action?

MR. HINNEFELD: Well, there's an issue of oronasal breathing in here which is --

DR. NETON: I think that falls into the same category as breathing, you know. In fact, we're going to discuss this at the Board meeting coming up time permitting, the oronasal --

DR. ZIEMER: As a practical matter, for example, on heavy breathing, it can't practically be carried out on a chronic basis, can it? There's some limit as to how long a person --

DR. MAURO: You hyperventilate.

DR. ZIEMER: Yeah, do we have a similar figure on even moderate or what's the intermediate? I mean, the light breathing includes some heavy and moderate, but as a practical matter I'm not sure a person can

engage a moderate level for --

DR. NETON: That's correct.

DR. ZIEMER: -- eight hours a day or ten hours a day or whatever it is.

DR. NETON: I've got a report that's in draft form where we've gone through and looked at a number of these global issues. I'm kind of getting ahead of the agenda, but it is true that in the literature you cannot breathe at a heavy rate for a sustained pace otherwise you hyperventilate. And that's the data on that.

DR. ZIEMER: But those workers have to stop and rest if only to get their breathing back to normal.

DR. MAURO: Before they pass out.

MS. MUNN: Hopefully, we'll hear a lot about that after lunch, right?

DR. NETON: One or two sound bytes more than that. I could talk more about the oronasal than the ingestion pathway.

DR. ZIEMER: Even if you could do moderate breathing eight hours a day, that's not going to change the final number by more than a few percent anyway.

DR. NETON: It would be pretty much

proportioned to the breathing rate if you had an air model. Now, this, of course, is not relevant when you have a bioassay-driven calculation. It's only in the air models where it becomes a possible problem. But it could change the numbers now 20 percent, 30 percent. But again, I could talk about that when we get into the other issue I think.

MS. MUNN: I think we should because looking at the time, I had hoped we would be able to get through the OTIBs.

DR. MAKHIJANI: I'm just gong to add a request about this particular one. Could we confirm that we're only dealing with metal facilities in this TIB? Because otherwise I think --

DR. NETON: Yeah, I agree with you. If it's being applied to facilities that process (unintelligible). Now it could be a facility that processed pure uranium materials and dissolved it and --

MR. HINNEFELD: Unless it was recycled.

DR. NETON: Right.

MR. HINNEFELD: Because if it was recycled there's another complication.

DR. MAKHIJANI: Just to clear up that potential, it doesn't look like non-metal facilities, but just to confirm that.

MR. GUIDO (by Telephone): The document mentions, I mean, the Sections 3.0 is uranium metal handling facilities, I mean, it's all here in forged uranium metal handling facilities.

DR. NETON: Yeah, I'm pretty sure it's one of the two. I can't think of anybody outside the big original ones that actually did any ore processing.

MR. GUIDO (by Telephone): I was looking for a caveat in it that says, I mean, I think it, I'm trying to read through to see what exactly it says that you can't do it. I know all the sections it's talking about uranium metal facilities. That was the understanding; that's what this was for.

MS. MUNN: But the current wording identified metal --

DR. MAKHIJANI: My only question was does it exclude, that it should, with these numbers, it should exclude chemical processing of uranium. And I haven't read the whole thing

recently, but maybe that caveat should be in there if it's not in there.

MR. GUIDO (by Telephone): That's what I'm looking for, an exclusion.

DR. NETON: Well, I mean, the list is there, and by definition, and it's excluded if none of those are chemical facilities. We'd have to look through and make sure.

DR. MAKHIJANI: That's the only request that I have.

DR. WADE: We captured.

MS. MUNN: So NIOSH is going to look at it to assure that it's metal only.

DR. WADE: And excludes chemical processing.

MS. MUNN: All right.

DR. MAURO: There are a couple of additional issues related though that we would probably want to close out because we're almost there.

MS. MUNN: Good.

DR. MAURO: On page 16 of the matrix, starting on the one, two, the third row from the bottom, there are two concerns that are raised. One has to do with the medical X-rays. In effect, what's happened here is we expressed concern that, and this is a cross-

cutting issue, the approach that is used right now for doing dose reconstructions for medical surveillance programs where workers get their initial X-ray, and then every year they get an X-ray.

We have a standing concern regarding the protocol in, I guess it's OTIB the work that he did. I forget the number. We're very much in agreement with the default set of numbers that are being used for her examination. In other words there's a coworker table that says her examination for breast, lung or whatever, here's the dose. And it gives it for chest X-ray, lateral and also fluoroscopic. So the unit exposures, we looked at that. We had one of our specialists, a fellow named Harry Pettingale*. We looked very carefully at that.

The overarching concern we have though is that there are issues related to retakes whereby multiple measurements are made. And then there's a general philosophy I believe that has been embraced, and maybe you've already resolved it your satisfaction, that there's a lot of other opportunities for

workers to receive X-rays during the course of his employment that were not taken into consideration.

And in our review, I guess it's OTIB-009, I think its, no, it's not OTIB-009. Our review of OTIB-0060, 61. Procedure where we've identified the particular issues or questions that we've raised. So anyway, it emerges here again because for all intents and purposes in this OTIB you've adopted that. In other words this OTIB-004 when it comes to a medical section adopts that procedure. So thereby the comments we have on the medical procedure carry over to this also.

Whether or not it's appropriate to discuss here, I just want to alert the Board that that, there are a series of questions and concerns we have related to medical X-ray dose reconstruction and them already delineated in our review of the applicable OTIB that also have applicability here. And maybe we'd leave it at that.

MR. HINNEFELD: I think Procedure 61 is on the --

DR. MAURO: It's on the agenda.

MR. HINNEFELD: It'll go beyond OTIB-004 --

DR. MAURO: It'll go cross --

MR. HINNEFELD: -- so we can address that --

DR. MAURO: -- we'll address that later.

Finally, there are a series of concerns we have that after you shut down, okay, you finish doing your metalworking operation, and you've got residual radioactivity on surfaces and then there's going to be exposure to the residual radioactivity. There's a method that's been adopted here that has in the end it comes out with a good number.

In other words the dust loading that the person is chronically exposed to from resuspension after he goes, what in effect is done here by the way, they said, listen, we know we're going to go with the 100 MAC during operations. But then once operations stop, we'll assume that what's in the air the next day when you stop work is at 50 MAC, and then it declines at one percent per day.

Then you've got time-integrated exposure. That goes away. But from resuspension, here's the amount that you

inhale. I'm thinking back now that that ended up with a result that seems reasonable because we looked it. We came at it from another perspective and checked some numbers.

And Bob Anigstein's probably on the line. He's the one who checked it and said in the end you come up with a time-integrated intake from the residual radioactivity that seems to be appropriate, reasonable and bounding.

But mechanistically, taking 50 MAC as your starting point and then the one percent per day sort of, the way we look at it, fortuitously ended up with a result of the time-integrated intake during the residual activity period was a pretty good number. I would say that the fundamental assumption upon which it's based really did not have a basis, you know, the 50 MAC and then the one percent per day. And so in a funny sort of way we agree with the outcome, but the method to get there was troubling to us.

MR. HINNEFELD: I think residual is one of those issues that's now one of our global issues.

DR. MAURO: This is different than the way, in all the other the residuals is across the board. In fact, I'm looking at TBD-6000 right now, and it's addressed there. In fact, it's addressed everywhere. And by and large the method that keeps being used is this method is one that was used.

There's another method that's used at again cross-cutting is this idea that you have dust in the air at some level, and that it's falling. And the reason why surfaces get contaminated is the dust is falling at its terminal settling velocity for five micron AMAV particles which is 0.0075 meters per second.

Now one of our recurring problems is that the activity -- and I think you solved the problem at Bethlehem Steel. In other words you abandoned that approach and have come up with an empirical relationship that works. And what we keep seeing over and over again in so many different places that 0.0075 deposition rate that's still everywhere. So I guess --

DR. NETON: Stu's right. That's an

overarching issue that was identified at Bethlehem Steel. We dealt with it within Bethlehem Steel, but we committed it might be in the wrong place. It was committed in the Bethlehem Steel closeout that we would go back and look at this issue at other sites. And in fact, we haven't addressed it here. So it's still here.

DR. MAURO: I think that concludes the concerns that were raised on OTIB-004.

MS. MUNN: All right, we have action items recorded for it, and I'll get them out to you.

Right now it is lunch time. I had hoped to be able to get at least a few words in about all of the OTIBs and any comments that have been made for the PROCs. But as stated before, we have more on our plate than we can possibly handle today. And some of the items that we have listed for the afternoon are really crucial for us to at least touch on.

It's my suggestion that at this juncture we stop for lunch, and that we try to follow the rest of the agenda that we've laid out following lunch with the expectation that

the next time we meet, we will, in addition to the action items we've listed, attempt to begin where we stopped here which is at the end of OTIB-004, pick up with OTIB-0018 and follow through the matrix from that point at our next meeting. Does anyone have any real grief with that?

MR. HINNEFELD: It won't compound that too much if we continue to generate responses those document findings we haven't generated responses for.

MS. MUNN: Au contrare, the more responses that we have the better.

Is that okay with everybody?

(no audible response)

MS. MUNN: All right, let's plan on doing that. Those of you who have action items for our period after lunch may want to take a look at them because we do want to try to go there if we can. And we already know that 52 is going to be a long discussion, probably requires more time than what we have here. But we want to make sure it is addressed. It's on everybody's to-do list right now so let's make sure we get to that. We'll talk

about global issues first. I don't think there's much to say about the ERs either.

DR. WADE: TBD-6000, that's on the agenda for next week's call so it would be good so it would be good if we could get a sense of where SC&A is.

How long are we breaking for?

MS. MUNN: We are adjourned for lunch. We will resume at 1:45.

DR. WADE: So we're going to break the line and at 1:45 or a little bit before we'll be back so dial in then. Thank you.

(Whereupon a break for lunch was taken from 12:35 p.m. until 1:45 p.m.)

NIOSH REPORT ON GLOBAL ISSUES

MS. MUNN: The first item of business that we have following lunch is a NIOSH report on global issues. Jim, I do not, or Stu, who is going to do this.

MR. HINNEFELD: We're going to tag team this.

DR. NETON: We're going to tag team.

MS. MUNN: All right, that's good. I don't even have in front of me a list of what we've identified as global issues that you're

currently addressing.

DR. NETON: Well, that was my question. Do we want to speak to global issues as reflected in procedure reviews or there's an entire list which I'm not, frankly, prepared to talk about today.

MS. MUNN: Only as is applicable to the charge of this particular working group.

MR. HINNEFELD: There were three specific topics, residual contamination, ingestion and then the third was internal dose from fission products.

MS. MUNN: One more time.

MR. HINNEFELD: Residual contamination, how to reconstruct that, doses from ingestion, and then internal dose reconstruction from fission products intake.

MR. HINNEFELD: I sent shortly after the telephone meeting I sent to the work group, and I hope I sent a copy of the ORAU TIB, ORAU TIB-0054, which describes internal dosimetry from mixed fission products in the (unintelligible). I sent it without any commentary. And I in the interim have gone through it, and I can briefly describe what

the approach describes.

The authors essentially ran a computer simulation program that would simulate the burn up and activation of the fuel elements in the fuel and the housing, for lack of a better word, that was wet for exposure in something like four or five or a few designs of reactors. Hanford Reactor was one. FFTF* was another.

Anyway, a selection of reactors with the thought that the reactors that were selected and were simulated in this fashion would represent essentially all of the reactors that you would encounter in the DOE system. They all fit into this grouping. The simulation with a code, I believe it was called origin, and it essentially simulates the burn up of the fuel and activation of the other elements in the production of fission products for runs at particular power levels for particular (unintelligible).

Having completed that the arrived at inventories of fission products and activation products which as you can imagine are very extensive. And then through a series of

assorted screening and evaluation techniques narrowed that number to worry about down to smaller and smaller groupings. The first value you take off, you take off the ones that have essentially inconsequential half life and don't have a radioactive daughter.

You don't worry about radioactive daughters. Worry about how much of it was generated. Some of the fission products there's not very much there. And then to, some of them have fairly, I won't say benign, but a fairly low dose. And then finally worry about dose conversion factors to find the handful or so that are dosimetrically significant. And then once you have that handful of radionuclides that you're actually going to analyze, you're going to apportion the total activity that the person took in, you know, as quantified by gross beta or gross gamma bioassay for instance, quantify the total activity and spread among those dosimetrically significant radionuclides.

Now in so doing you build in a lot of favorability and no raffinating because you've taken the activity that was really associated

with the less dosimetrically significant radionuclides, and you attribute it to the dosimetrically significant ones. So you're building quite a lot of favorability in doing that. And eventually you arrive at an essentially a suite of a handful or radionuclides and a marker radionuclide that you kind of feel it's your one.

And you can say, okay, if I've got so much Cesium-137, that means I have 50 percent of that other nuclide and 30 percent of (unintelligible). And then that's how you interpret and ascribe that beta or gamma radioactivity from the bioassay or premiere sampling into a selection of radionuclides for dose reconstruction.

Briefly, that's what it does. There's a lot, there are a lot of numbers and table in the TIB, and I think it would take quite a lot of review probably by SC&A or whomever you, whoever's assigned to do it to kind of follow through and interpret. It's not something, I don't think we can talk about it in any meaningful fashion. But if there's, you know, in order to deal with that issue of fission

product dose, yeah, dose from fission products since it's on the table, I think that's the way we would have to go. Is to say is this technique, is this a suitable technique.

And then further than that this document was prepared after some dose reconstructions were done at Savannah River because the issue originally surfaced in Savannah River dose reconstruction reviews. That's where it originally surfaced. And Savannah River was done before this TIB was prepared, but it's the technique and the thought process is the same. You take a dosimetrically significant radionuclide, ascribe the activity to that radionuclide, and then you have essentially provided at least a favorable aspect of what the intake was.

So the whole thing is wrapped up not in a review of OTIB-0054, but also in did those dose reconstructions from Savannah River use a suitable analog or a bounding analog of that approach although not quite as complicated.

Did I do it okay?

MS. MUNN: The attachments certainly appear

to be well presented in depth.

MR. HINNEFELD: The document's like 77 pages long, but almost 50 pages of that are just tables.

DR. MAURO: Stu, how is it intended, I know we have the OTIB-0018, the 33 that we're talking about. Where does this protocol fit into the grand scheme of coworker?

MR. HINNEFELD: Well, this would be for bioassay data that was recorded as total beta or gross beta, for instance, or total gamma. And there's even a way, there's apparently at one of the sites, I believe it was at Hanford, there was a certain chemistry that was done on bioassay samples that would eliminate some debate and keep this other suite -- yeah, chemical separation data. And so this even does that, and so if that's the data you have, you use one suite of numbers. If it's a gross beta number, you use a different suite of numbers. And if it's at total alpha number, you use a different suite of numbers. So you have the bioassay measurements which would give you an indication of what was being excreted, which model you use on, you know,

which model you use, I think, gets wrapped into which, you know, the select suite.

DR. MAURO: I know when I was looking at, I didn't review this document. I did get a copy of it. Transportability, I recall when I was looking at issues like that in a different context there certain radionuclides enter primary cooling, for example, of a reactor whether it's light-water reactor had greater propensity to escape. For example, as I recall Cesium-137 moves more rapidly than Strontium-90.

So the different radionuclides have, notwithstanding the differences in dose conversion factors and the differences in fission yield quantity after a certain amount of burn-up, there's another dimension which is the degree to which it's likely that that radionuclide is going to escape with the fuel, enter the primary coolant and become airborne through some leakage or by some means. And that's another sort of filter that could have to play here that may not make your approach even more conservative or less conservative.

MR. HINNEFELD: I believe it is addressed.

I only really, frankly just read this this week, and I believe it is addressed in a sort of a release fraction. Whereas, a volatile like iodine or tritium would have a one as a release fraction. Certain elements would have a 0.5 and some might have 0.1 or something like that. I believe it is.

MS. MUNN: Well, you impressed me by the sagacity shown by including 5.2.2.2. Any time you include the FSTF in your analysis, I find it --

MR. HINNEFELD: We got some brownie points on that.

MS. MUNN: Thank you so much. Is this one of the procedures that we have on your list, John?

DR. MAURO: No.

MR. HINNEFELD: I don't believe so.

MS. MUNN: It is not. I'm assuming then in order to fulfill our requirement of this work group it is incumbent upon us to suggest that this be included on the list. Is that the feeling of the other members of this body?

DR. ZIEMER: This just came out this year.

MR. HINNEFELD: It's pretty recent. It's

pretty recent.

MS. MUNN: It's brand new, yes.

DR. WADE: Are we approaching a new year to assign procedures to SC&A?

MS. MUNN: I believe we are. We've already looked at most of what you're going to be looking at next year.

DR. MAURO: Yeah, we have delivered all the procedures that we owe you people.

MS. MUNN: For this year.

DR. MAURO: This year, and in fact we've even tacked on this TBD-6000 as sort of an add-on because we have the resources to do it. Now this would be like the first of perhaps another set of 30 that might come in the next year.

DR. WADE: October first is not so far off.

DR. MAURO: Or we can try to work it in, but I am getting a little concerned that we might be straining the resources of Task Three. Because we were fortunate to have Task Three came in within budget, well within budget, which allowed us to add in the TBD-6000. To add this in also, you know, it's hard to say whether we can handle it.

DR. WADE: If it's the work group's preference, we could negotiate that. If you can wait until October 1st, we can do that as well.

MS. MUNN: I wouldn't expect that it would require being done in this fiscal year, but --

MR. HINNEFELD: In order to work on it though, you have to task them to it even though most of the work would occur next fiscal year.

MS. MUNN: That's probably the case. Paul, what's your feeling?

DR. ZIEMER: It seems to me we could, we're close to the starting fiscal year. You're not going to --

MR. HINNEFELD: Well, the fiscal year starts the day before the next work group meeting. We're meeting on October 2nd. The fiscal year starts October 1st.

MS. MUNN: That's correct.

MR. HINNEFELD: So you could make the assignment. You can make the tasking on that day at that meeting.

DR. WADE: Or we could do it now. I mean, I can handle it contractually. If you tell me

you want this to be done next year, then we could have the Board, if you like, react to that on the call next week, and we could be ready to go.

MS. MUNN: My preference would be to have this group recommend to the Board that this particular, that OTIB-0054, be on the list for the coming fiscal year. Is that --

DR. ZIEMER: I agree with that. Is this OTIB actually being used now? Or what's its, has it been approved for use?

MR. HINNEFELD: Yes.

DR. ZIEMER: Then we need to get it in the list.

DR. WADE: And it's OTIB-0054.

DR. ZIEMER: And this is going to be used where you have gross beta bioassay or worked in reactor facilities --

MR. ELLIOTT: Or worked with fuel.

MR. HINNEFELD: Right, reactor source terms, right.

MS. MUNN: Fission and activation product assignment for internal dose-related gross beta and gross gamma analyses. Very good, we will make that recommendation to the Board.

DR. WADE: We have work group reports next Tuesday, so if you would include that, I will capture it as an action item.

DR. MAKHIJANI: This is a minor addendum to what John said about status quo this year. We have two reports coming within this whole year. One is the typesetter, and the other one is not yet written, but it will be here before the first of October.

MS. MUNN: Very good.

Next item.

DR. NETON: The remaining two issues we spoke about the fission product are ingestion and residual contamination. I'll start with the ingestion pathway. We have undertaken a pretty extensive literature search. I think I've briefed the Board on this several meetings ago, but just to summarize where we're at did a literature search to look at all potential pathways where one could ingest material.

Specifically we're focusing on the workplace and looked at transfer factors from surface to mouth, peri-oral to mouth, that sort of thing, and developed what I guess I'd

call a kind of model, you know, all these pathways connecting together and coming up with distributions on each of those parameters based on the literature search.

We haven't finished this. I mean, the research is done. The model's developed. What remains to be done is to edit the document that was written describing how we did this, and then to do some test runs with this model to look, to evaluate how well our current approaches in dose reconstruction model or account for the ingestion pathway.

I think we think right now it looks like that we've been fairly generous in doing claimant favorable in our approaches. This model I think will end up validating that. If not, then the model would have to be used to modify the procedures accordingly to account for what was deemed to be ingested in the workplace.

It's not done yet though, but the bulk of this is done. It's a draft. We had a contractor helping us work on this. So that needs to be tidied up, edited and the validations run, done before we can finalize

it.

MS. MUNN: We hope for it by next work group meeting?

DR. NETON: In October? Probably not. There's a lot of computing and conflicting things going on right now that would be hard to --

MS. MUNN: The work group meeting which probably will occur between October and January.

DR. NETON: No, it's months. It wouldn't be October, but after October I think there'll be more time available to finalize this.

DR. ZIEMER: Jim, what are you modeling? Is it transfer from hands to --

DR. NETON: Surface to hands, hands to mouth, cigarettes to mouth --

DR. ZIEMER: -- coffee cups to licking your lips --

DR. NETON: -- as much as we could find out --

DR. ZIEMER: -- in a contaminated environment, licking your mustache.

DR. NETON: It turns out a fair amount of that was available in the industrial hygiene

literature which I had. I guess I was always thinking the rad literature is much more full of things like that, but there's been some studies done, specifically in the workplace to the extent where we could develop some distributions about those parameters. But anyway, I can't give you firm date, but it won't be October.

MS. MUNN: But you'd be more comfortable with saying by the January meeting you'll have an opportunity to have something.

MR. ELLIOTT: I think we learned from our experience in the TIB-6000 modeling effort, too, test the model. That's the biggest piece here, I think, left to do. Right, Jim?

DR. NETON: Right.

MR. ELLIOTT: That takes more time than we anticipate, at least generally anticipate.

DR. MAURO: I just happened to review the TIB-6000 section dealing with ingestion, and I happened to have hit on one spot that I'm looking at right now. And are you using the RES-RAD 2.4 ten to the minus nine --

DR. NETON: I think that's what's in there.

DR. MAURO: -- per meter squared. It's a

fraction? Because we're researching that at the same time. So interestingly enough, a lot of the work we're doing on TBD-6000 probably is going to have a lot of applicability here, too. And we'll have that work very soon. We're -- I know we're going to talk about this, but there's --

DR. ZIEMER: What do you test it against?

DR. NETON: We're just looking at it against what we can find in the current site profiles just to look to see how --

DR. ZIEMER: If it would change significantly.

DR. NETON: Yeah.

DR. ZIEMER: Are there any real-world datasets that you can test against?

DR. NETON: I had hoped actually this was my --

DR. ZIEMER: I mean, where do the transfer numbers come from?

DR. NETON: There are some field measurements out there. For example, in the early fall-out days people were working on a contaminated aircraft. And they actually did some measurements item by air-type

measurements. Those sort of things. There's some Oak Ridge studies about transfer to cigarette, people smoking on break, that kind of stuff. We gleaned as much as we could from the literature on that.

What I hoped to do, which didn't pan out, my thought was that a lot of uranium -- and by the way, this was mostly relevant to uranium because it's where the AWE's where we don't have bioassay data. If you have bioassay data, this is not an issue. Where you don't have bioassay data at the uranium facilities, I thought that we could take a place like Fernald, for example, and just look at what's not being screened in the urine of these workers.

People who weren't exposed and working day-in/day-out in the plant, and one could put an upper limit on the amount that is ingested based on that. You would assume a certain amount would come out in the urine if they were ingesting. And at one time SC&A and NIOSH were debating whether it's 100 milligrams a day.

I always thought that was high, and I

thought, well, surely if you ingested 100 milligrams of uranium per day it would come out in the urine of the workers who were monitored routinely. Well, that didn't work out for a number of reasons, you know, the solubility issues and those sort things, missed dose. It just was not a practical approach. I thought we were going to have this great publication on that, but it just didn't work out. So we ended up going with sort of the (unintelligible).

DR. MAURO: The EPA did a lot, you know, the EPA has their 50 milligrams per day number, and I remember reading that literature. A fellow named Calibresi* that did a lot of work. What he did was he measured, I think it was how much silicone is in the feces of people that were working in gardens. In other words, know much milligrams per gram of dirt of silicone is in the dirt. And the only way you're going to get silicone coming out the other end is because you ate some of the dirt.

DR. NETON: Now, I disagree with that. I think that study is flawed because they didn't account for the amount that was ingested and

subsequently swallowed. So he's got both pathways he's measuring --

DR. MAURO: So the breathing it in is swallowing, too.

DR. NETON: Yeah, I think there's a flaw in that study. But anyway, this is where we're at.

The residual contamination we're not nearly as far along as this. We developed, as John talked about earlier, a model for Bethlehem Steel where we actually took residual contamination, inhalation of material that's suspended from residual contamination that we're talking about here.

At Bethlehem Steel we actually took some air sample data, silicone data. But at Simonds Saw & Steel where the plant was, where they were not rolling any uranium, just had air sample data which presumably would be anything in the air at that point would be a result of people just walking around, doing their normal path without blowing uranium into the air from rolling it. We developed some pretty good ratios there we thought that we could apply to places like Bethlehem Steel.

SC&A's comment on that was that looked okay. It was probably applicable to a Bethlehem Steel. It would transfer down to that type of facility, but they weren't convinced that it was generically applicable at all these different sites. So we're in the process of looking for more data to support this, and if need be, modify the values to account for different operations, that sort of thing.

The data are fairly sparse. It's very rare where you have data where it's really not in operation. They're taking air samples to document the resuspension factors. We are working on this, but we're not as far along as we were with the ingestion model.

DR. ZIEMER: Well, the issue of room clearance was discussed this morning as one percent per day. Does that arise in this context, too? Are you looking at settling out or those kind of factors or is this just resuspension?

DR. NETON: This is resuspension material that is I can pretty much assume once they shut down operations we knew that the air

clears pretty quickly at uranium facilities. So what you're left with is a blanket of uranium.

There's two issues. One is how much is re-suspended from what was deposited and how much is actually removed from the plant over time due to just cleaning operations and such. And that's the more difficult of the two, yeah, the dilution factor.

DR. ZIEMER: Particle distribution of a re-suspended material might not be the same as the original, but the heavy stuff come back up into the breathable air?

DR. NETON: That's a good question. I don't really know. We believed it was empirical. We took air sample data that was generated at Simonds Saw and Steel. But you're right --

DR. ZIEMER: Well, if the air sample data's got the full spectrum of heavy stuff down, I would think re-suspended, intuitively, I'm feeling like it ought to be a much smaller aerodynamic particle size.

DR. NETON: That's a good point. We did take the air that was re-suspended. We presume it's re-suspended because the plant

operations have been shut down for some time yet they were still continuing to monitor the air in the plant. So we had pretty good confidence that this was just based on resuspension plant activity. But you do raise a very good point is that is the re-suspended aerosol a finer aerosol.

DR. ZIEMER: Yeah, and therefore likely to get to the deep lung or something.

DR. NETON: This is probably one of the difficulties. It's not easy to come up with some concrete numbers.

DR. MAURO: Has (unintelligible) literature health.

DR. NETON: Yeah, we've looked at that sort of stuff, too. You have used a Bethlehem model at some point.

DR. MAURO: Yeah, we did.

DR. NETON: I can't recall the mechanics of that model now, but it was a pretty complicated model.

MS. MUNN: But all three items are working in progress. No timeline possible for any of them right now.

DR. WADE: Or we're going to hear by

January.

MR. ELLIOTT: We'll come back to where we're at status-wise --

MS. MUNN: Thank you.

MR. ELLIOTT: -- but can't predict today.

MS. MUNN: Anyone else have any comment on global issues before we move on to PERs?

(no response)

PERs

MS. MUNN: Apparently not. Who's going to tell us where we are with P-E-Rs?

MR. HINNEFELD: I guess I am. I think the context here was the discussion is this topic or another set of documents or procedures for the work group to concern themselves with. Just done a little bit of evolution in the PER process because of our conversation with the Department of Labor. And if a PER was as envisioned, it would allow us that when we adopt a change in dose reconstruction techniques, it would allow us to consider the universe of claims that may have been completed using the old, no longer used, and to provide to the Department of Labor a listing of that population.

Here are the ones that could potentially change outcome because of this dose reconstruction. And the idea was that the Department of Labor would be sending a bunch of letters to people whose cases were closed and tell them that it was going to be reopened just to have another denial come back.

Well, we've not been very effective at getting these turned out and over to the Department of Labor. And they feel like they have a lot of liability with changed techniques out there with dose reconstructions from old techniques that the dose reconstructors go out there and do what has to be done. They are pretty assertively now returning those cases to us for rework. So we have a larger population of reworked dose reconstructions to do.

So there is still a little bit of work that we do get to do up front, to do that screening and winnowing of that approach, of the numbers. Dave Allen's the guy who's in the middle of that. And so there is still a certain few things you can do. For instance,

if the change is the maximum of four rem a year, it's the highest increased dose you could get out of the change.

And you take a dose reconstruction if you give this person four rem a year extra to their target organ, and they still don't look compensable, then I think they probably will go along this, okay, this one can drop out and doesn't have to be reworked. So there's very, there's a far more limited kind of screening we'll be able to do today.

So with respect to a PER and whether it's good fodder for the working group, what it would look like would be, what the document would look like would be, it would a description of here's the dose reconstruction technique change that we're evaluating, Super-S plutonium.

Based on this, you know, and here are, we might say this is the maximum change it can make to a non-respiratory organ. And based on that anybody with a non-respiratory organ cancer whose probability of causation was below, what, 20 percent or something because maximum change could only bring them up to 45

percent, and doesn't need to be done. I mean, there may be some analysis like that.

MR. ELLIOTT: I have to say something at this point. The charge of this working group to look at procedures and I think is fully appropriate to applied to PERs. However, I would ask that you treat this as you do in the subcommittee and Board's review of completed dose reconstructions.

By that I mean that you would need to examine a completed PER, not pick up a PER in progress where we're -- like Super S the example Stu just gave you, where we are working through about 3,400 claims right now. We need to get through those 3,400 claims and say that we're done. And then I think it's your ample opportunity to examine how we performed our work under a PER.

I don't know if Emily will chime in here or not, but I think these claims are still in, even though they've had, in some cases, a recommended decision, in other cases a final decision, once they're remanded back to us for rework, then they're still in the adjudication process. And we need to treat

these as a non-adjudicated claim until the PER is completed.

And so right now I think we've only got maybe two, maybe three PERs we could point you to. The other thing to consider here is that right now as we're, with the advent of all of the PERs that we're working on, we're examining the claims against changes other, that were made that might affect the claim besides just the PER that is facing the claim.

So there's that going on. Very complicated process right now for us and those that support us. So that would be my commentary that I needed to leave you with.

MS. MUNN: The interpretation of the Chair of this group that we really cannot look at PERs in any depth until they have, in fact --

MR. ELLIOTT: Until we show that the last claim has been examined against the PERs.

MS. MUNN: They're done. I think it's incumbent upon us as a work group to maintain some sense of where we are with the, and how pervasive they become. But aside from that, that's the only expectation that I have. Does anyone else in the work group have other

expectations of this?

MR. ELLIOTT: We certainly would commit to get back to you as soon as, with a list of completed PERs, we'll add to that as we complete them.

MS. MUNN: That I think is precisely what we need to look at in this group until we reach a point where there's something other to be done than that.

MR. ELLIOTT: I'd like for the working group and the Board to understand that there's different, in these claims that have had a decision there's a unique category that Stu referred to earlier that DOL feels they have a strong liability with, and that is the category where there's a recommended decision, and there's a timeframe of, I think it's one year, that they have to come to closure, to a final decision. And so in our priority of work under PER, that category is given a higher priority. We're working those first within each PER.

MS. MUNN: Very good.

MR. ELLIOTT: I'm sorry. Did you have something you wanted to --

DR. NETON: I was just going to say they've actually become very much less interesting based on our new approach because we are requesting most of them back for rework. Part of that reason is because DOL requires some pretty good stringent standards to be placed on our proof that they weren't affected.

And what's happened is we've had a number of simultaneous changes to the point where we can't have, isolate one change at a time anymore. There might be one change you could say won't affect it, but there may be six other changes that affect the same one. So for instance with the Super S, I think we just asked for 4,000 cases back for complete rework.

We're just going to work them from square one and apply every change, treat them like the novo dose reconstructions. Everything we've done today will be done against that case. So the ones that we screen out are the very simple screening tools like there was no plutonium at that facility. There could have been Super S. Those are the kind of simple screening tools we apply now.

There aren’t these elaborate tools to try to figure out change to two percent or --

MR. ELLIOTT: We can certainly look on our website and see the PERs that are presented there. And there are different screening mechanisms outlined in each. And of course the first screen is was the claim completed before the change was instituted. And if it was completed after that, then we don’t have to look at it because the change was applied to it. But as Jim says there are other levels of screens that can be applied beyond that.

DR. WADE: At some point when a change or a series of changes results in a series of reworks of dose reconstructions, will that be reported in some document? Will that be a PER?

DR. NETON: The reworks themselves won’t be because they’ll be treated as the novo dose reconstructions and sent -- novo’s not the right word -- but complete reworks, and they’ll be sent through, the claimants notified, claimant gets another close-out interview. That whole process takes place.

MR. ELLIOTT: But I think to answer, to your

point though in your question, Lew, we need to be ready to identify when we've analyzed that last claim under that particular PER for the purposes of the working group.

DR. WADE: What form would that take? Is this will be a newly generated document that you would prepare that would list the dose reconstructions and make them available? Or how would --

DR. NETON: Well, the PER itself would identify, for instance in the case of Super-S that there were 7,000 cases potentially affected by Super-S. And then we'll say that there were 4,000 that we believe Super-S really had the potential to exist then we need to send those cases back for dose reconstruction.

DR. WADE: Would it go beyond to say of those 4,000 the decision was changed and there is --

MR. ELLIOTT: Well, we are interested ourselves in how many cases flip. And DOL's also interested in knowing how they flip either way. We're more interested in making sure that we don't miss one that flips from

non-compensable to compensable. But they want to know how many went the other way, too.

So I think we're going to have to provide some level of reporting about that. And right now there are a few completed PERs that have that information in them, but you'll see a majority of our PERs don't have that because we haven't finished it. We need to come forward with some kind of reporting mechanism.

DR. WADE: Once it's finished then it's very interesting for this work group to look at that and decide what it wants to do with it. It is business that we're doing now that the Board needs to have the ability to review.

DR. NETON: I don't disagree. I guess the problem is though when you have multiple changes affecting multiple dose reconstructions, it's hard to identify which change was the one that might have flipped it. I think reporting raw numbers as to how many were changed, that's not --

DR. WADE: The work group will have to struggle with that.

MR. ELLIOTT: Well, we will have a tracking

system that we're working on, too. And that might be the vehicle to aid the working group with.

DR. NETON: The other, just to close it out, is just because we asked for it back from the Department of Labor doesn't necessarily mean we'll get it. There may be other things like SEC, certain cases have got to SEC or the case has no eligible survivor. I mean, there's a number of issues that we don't control. We'll tell them that these cases need to be reworked. It's up to them to send them back to us for rework. But a good percentage of those, so for instance at Rocky Flats have gone SEC. We're not going to see them.

DR. WADE: This is a great positive evolution from my point of view, and I think it's important that in some way if the collected together and the Board had the opportunity to look at it if it wishes.

Larry, when you said you'd provide a list of completed PERs to the work group, when would you first do that?

MR. ELLIOTT: Oh, I think at the next work group meeting we can give you a list of those

that have been completed. We can give you another list of those that are underway. That should be straightforward.

MS. MUNN: That's really all we need in my view at this juncture.

Anyone else have anything to say about PERs?

MR. ELLIOTT: It would be the PERs themselves, and then if the Board wants a list of the claims under a PER that's been completed, we could provide that.

MR. SHARFI: Some of the ones that were put in the previous PERs are now in the new PERs.

MR. ELLIOTT: Yes, they are.

MR. SHARFI: That claim back up?

MR. ELLIOTT: Right, we'll have to. That's why I say this not straightforward. It is going to be very complicated for us to --

MS. MUNN: We have another living document.

DR. WADE: Well, with any document though that goes to the value added by review and the fact that there is a commitment to serve the claimants in this program.

MR. ELLIOTT: And there's an end point here, too. It's not like, you know, we have a bulk

of these that we're faced with right now and once we work through those, yes, we'll still have PERs in our future but not the volume, not the magnitude --

MS. MUNN: Not like this.

MR. ELLIOTT: That's right.

MS. MUNN: We appreciate that. We'll look forward to seeing the list at our next meeting.

DISCUSSION OF OTIB-0052 AND SC&A REVIEW "PARAMETERS TO CONSIDER WHEN PROCESSING CLAIMS FOR CONSTRUCTION TRADE WORKERS"

And now, everyone take a deep breath. OTIB-0052, parameters to consider when processing claims for construction trade workers. Who wants to lead off here? Have we even discussed this?

DR. NETON: I would think SC&A would present their findings of their evaluation.

MS. MUNN: I would like to hear that, and I believe SC&A is prepared to do that. John?

DR. MAURO: This is Steve Marschke who is the author of the document along with Arjun. Steve, if you want to kick us off?

MR. MARSCHKE: Yeah, I was given the task to review TIB-0052, and we in somewhat more detail than what we usually perform our

reviews of the procedures and the other documents. And the end result was the Task Three Supplement Four report that you all were given. I guess it was issued back in July.

Generally, I think we like what we saw in OTIB-0052. Most of our comments that we made are, I think are geared towards making a stronger document. Making it more bulletproof, if you will. But in overall I think the, well, the approach that we kind of took was kind of a two-pronged approach. One was we did try to look at the analysis that was done and duplicate the analysis that was done by using the data files that were made available to us on the O drive.

And then we also took it a step further, and we ran some sample cases. And a number of sample cases to Jim Neton mentioned this morning when we were talking about TIB-0020, the proof is in the pudding. And so we tried to show what would happen if we had some, if we treated some construction workers who had monitoring data as if they did not have monitoring data.

And we applied the OTIB-0052

methodology to these construction workers and compared those results to their actual monitoring data just to get a feel for how conservative the OTIB-0052 or is the OTIB-0052 methodology conservative. Generally, we found out when we did that, we did that mostly at three sites: Savannah River, Rocky Flats and Hanford.

And generally when we did that, we found that the OTIB-0052 methodology was conservative. When we took a ratio of the OTIB-0052 methodology divided by the measured dose doses. And these are integrated over the working life of the individuals that we looked at, the sample workers that we looked at. Generally, we found a ratio greater than one implying that the OTIB-0052 methodology was, in fact, conservative.

There were a few outliers and a few exceptions. The other thing that we did look at was or one of the questions that came up was do different construction occupations have, you know, higher exposures than other occupations. And this was really not addressed in OTIB-0052, but we tried to look

at that somewhat.

And we found that, yes, there is a range or seems to be a range by occupation with people like pipefitters, boilermakers and so and so forth, they receive doses which are higher than, generally higher than the construction worker average. Teamsters, electricians and painters, they seem to receive doses which are lower than the construction average.

So when we took our samples to test the OTIB-0052, we kind of tried to select our individuals. It wasn't quite a random test. We tried to bias our individuals from those occupations that received the higher doses like pipefitters. If you look at the Savannah River, you'll see we have, out of the 20 workers that we sampled, we have ten pipefitters. And even in that case we found that the OTIB-0052 methodology generally was conservative. Generally overall, we are happy with it. Now the -- at least I'm happy with it. I don't want to speak for everybody.

But there were some concerns. I mean, one of the reasons why the OTIB-0052

methodology is conservative is because we are integrating over the working life of the individual. So if you had an individual in there who basically was only there one year or a very short period of time, there is the distinct possibility when you look at some of the graphs that are actually in OTIB-0052, you can see that the construction workers' doses are much higher than the 1.4 multiplier.

So the OTIB-0052 methodology over a short duration may not be conservative. And we kind of, I mean, how do you address that? I'm not sure how to address that.

DR. MAKHIJANI: Can I just interject that the short period of time would generally be less than three-to-five years.

MR. MARSCHKE: Yes.

DR. MAKHIJANI: And the sort of long period of time that we examined was like ten years. So it would be ten years or more.

MR. MARSCHKE: That's a good way to capture it.

DR. MAKHIJANI: Just to put some numbers on where these uncertainties are, and where it didn't appear to be a significant issue.

MR. MARSCHKE: The other thing I, later I got from reading OTIB-0052, again, it's kind of like OTIB-0020 that we talked about this morning. It's more of a guide for the writers, the site experts when they are developing their coworker models and their coworker OTIBs. They put a table in the coworker OTIB which is for construction workers, and I get the impression from that and from looking at OTIB-0052 itself that this guide is more for those people than it is for the dose reconstructors.

And so we do have some concern if you have dose reconstructor who happens to get a, be trying to reconstruct a dose to, for example, a pipefitter whose only been there for three years, a short period of time, then this methodology may not be favorable under certain sets of assumptions that could be populated. And so again, I'm not sure how to ensure claimant favorability on a individual claimant's claimant basis.

Overall, you know, if you looked at the whole population of claimants, construction workers, I think OTIB-0052 is

favorable. You know, if you look at it percentage wise it's probably in the 95 percentage or definitely greater than 90, probably 95 percent of the time it's a claimant favorable one.

The question is there are certain, you know, that leaves five percent of the claimants out there who basically how do you get claimant favorability for those individuals? And I'm not sure how that can be, you know, is incorporated into OTIB-0052.

MS. MUNN: I had a question with respect to the specific items on the matrix. I don't know whether NIOSH has had an opportunity to look at that matrix and to address those questions or not, but I have not heard any rumblings that there are responses to any of those.

MR. CHEW: They've been out already.

DR. NETON: Yeah, we sent them out.

MR. CHEW: Yeah, we sent the responses to everyone.

DR. NETON: When did they go out? Monday? Probably while you were traveling.

MS. MUNN: While I was in the air.

DR. WADE: There's a thought, too.

MS. MUNN: Thank you.

DR. NETON: We did have an opportunity to (unintelligible) some reaction to these things. Mel Chew --

MR. CHEW: Do you want me to grab a copy?

DR. NETON: We're prepared to go over them individually.

MS. MUNN: Does everyone want copies?

DR. NETON: This document came out in July sometime so we've had a short time period to address a hundred-page document. But we were somewhat gratified to see that we aren't that far apart really.

MS. MUNN: I was pleased to see the matrix wasn't any larger than it was.

DR. NETON: It was 37 pages.

DR. MAKHIJANI: May I add a couple of criticism just to supplement Steve's summary there. That there is a, well, it will come up in the matrix, there's an item, well, a number of items one about neutrons, for instance, has a gap in that regard. It didn't cover neutrons. And so maybe we can just pick that up.

MS. MUNN: Yeah, as we move down it.

If NIOSH is ready to address those matrix items, I would be very pleased to hear that now. We'll have hard copies. You can go ahead. We don't have to wait for the hard copies. Whoever's going to do that.

DR. NETON: We're going to rely on Mel to do the heavy lifting with encouragement from me.

MR. CHEW: We can do a couple things. As you see, we did respond to the matrix.

And Steve, thank you very much for your comment about the overall -- I'd like to reinforce what Steve said -- for as you said, pretty much 95 percent of the cases here at the 95th percentile, the correct adjustment factor was. This is really, we need to focus what we're trying to do.

This is for the unmonitored construction worker, unmonitored construction worker and not to be confused with the person who was monitored. And so where do we get unmonitored construction workers and all of their missing data that's possibly from their data. And did they happen to have basically on their claim that you can show that they

should have been monitored. So we need to make sure we're focusing on the unmonitored workers.

I think we're very fortunate and just give a little background. This was quite an interesting assignment for the team that we put together. We had to go to observe and get some data across the complex that was representative. Certainly, we went to the site as number one, certainly, where we can now separate information that we can identify construction workers versus the all monitored workers.

Remember clearly what we're trying to do is to say are there circumstances where there are construction worker who was unmonitored and we had to go to a coworker study that the coworker study was not necessarily claimant favorable to that unmonitored construction worker. So that's what really the basis of involving the adjustment factor.

I could go on, and we could go right down the matrix one item at a time, but we want to maybe for the sake of saving some

time, I would like to address the issue that we brought up directly about the example of the pipefitters and things like this where we think we have applied the proper adjustment.

MS. MUNN: My preference would be that you address the question that's been put on the table and questions that are out there. And then if there are other remaining significant items from the matrix that we look at those afterwards. If any of the matrix items are not of significant importance that it would make differences that we should be concerned about with respect to dose reconstruction, then those are issues which we can easily, I would think, resolve offline. What we want to look at is what is significant. What's been brought to us as being significant. Let's do that first.

MR. CHEW: I'm not sure everybody has a copy. This is directly comes out of the table that you people put in the response, and it's in the SC&A report.

I'd like to make a very quick comment. When we, this was not a simple data gathering exercise in just putting information on a

spreadsheet and come up with certain percentages, right:. We went to specifically the site to clearly look at when we saw exposures, and we clearly explained by either operationally or reasons why exposures were high for a particular year. What things that happened at that particular site. What operational things happened at that site that cause, for example, certain categories that people could get more exposure.

And the one that is in your report that is in pretty color -- and unfortunately, we didn't print this out in color. It would probably be easier to see -- is a very good one. This is Savannah River. Fortunately, Savannah River had kept very good records of exposures to their categories of construction workers broken down by construction worker. And that's even better than we even expected. You know, we can pick out electricians. You can pick out pipefitters. You can pick out millwrights. You can pick out carpenters and painters.

I'd like to make another comment. Like the pipefitters and electricians by about

a factor of four or five times more at Savannah River than almost all of the other categories. And then there's a little anecdotal story that I've been share a little bit here if you don't mind.

We were wondering why there, because we understand the pipefitters to be a large number because as you well know if you've been down to Savannah River, especially the canyon, it's really a plumber's nightmare. Everybody can relate to that one there with plumbers. And then certainly some of the cement finishers have high exposure, too, because they have to make the chases so they could put the plumbers in.

Well, we often wondered why there was about equal number of electricians as there were pipefitters which is certainly an anecdotal story, and I appreciate the time to tell it. It appeared that in the early years one member of the DuPont family owned an electrical company. And so the electricians were of the higher paid category, billing category there.

And so you can just relate to your own

thoughts in telling you why there were more electricians than anyone else because we did go down to talk to some of the workers directly so we can relate to exactly what happened at Savannah River. And they said, oh, yes, there was a lot of electricians and some of them were not necessarily always doing electrical work.

I'll leave it there with that one. I think we can all smile at that recognizing that DuPont operated Savannah River for a dollar a year. I think we need to understand that.

If you don't mind looking at the graph that I just showed you, probably the key one that rightly point out, Steve, there are some, a few years, that the some specific categories of worker would have been hired in the 1.4 multiplier that we suggested. And so if you look at the date here, it happened in about the late 1960s and again in about the mid-1970s were example pipefitters got a significantly higher exposures than what you considered the all monitored worker.

I think Jim and I were discussing

that. Remember, this is an important piece of information for the very fact that these people were monitored. And how do we know that they were monitored? Well, going back to look at that particular timeframe, there were two canyons, the F Canyon, which people call F, and H Canyon, was going through some fairly major modifications and to the improve the particular processes.

And so pipefitters were brought in for those particular periods. This is under, the canyons were classified area, Q cleared area and a badge. So we need to examine ourselves in saying, well, is it reasonable to say that we're going to have an unmonitored worker that if we multiply his, we're taking all monitored worker exposure, multiply that times 1.4, do you think that's a reasonable, that that really happened? That he would receive a significant exposure that he wouldn't be monitored.

And I think that's a judgment for this discussion here, but I think it's a plausible reason for saying, okay, yes, I can multiply that. I did a very quick job. I did a

calculation here. We looked at the high peak of a pipefitter versus the all monitored worker, the multiplier was 1.8 for that one year, for that one year. One point two for the high peak and another one down the lower, the multiplier to be 1.5.

Is it plausible -- and, Arjun, you mentioned could there possibly a third period of time for that person that were only working for those few years. Probably so because they brought in a lot of people. You know, they didn't work any place else. But again, is it plausible to say that person wouldn't be monitored. And this is the 95th percentile. And we would multiply an all monitored worker dose which includes, which includes the construction worker dose multiplied times 4, would we be adequately claimant favorable for that particular claim?

And I think that's probably a discussion that I'd like Steve to talk about the particular categories of people. And the Savannah River data is a very, very good one because it has the ability to separate out. Now, in add to that do we look at some of the

other facilities to see the same thing happening here? Wherever we had, especially Oak Ridge National Lab, we went through some, working with some of their reactors when they did some modifications. I think you know about those, John. Hanford, you know, when some of the separation processes. The Chem Plant in Idaho is a very good one.

So all along the way when we're looking at exposures, we just didn't take the all monitored worker. Wherever we were able to separate, and in many place we were able to separate each of the different types of construction workers. We were trying to make sure that some particular group would not stick out consistently that would now invalidate the issue about is the multiplier valid across this exposure record. So I want to let him comment on what I just said. I'll stop everything.

MR. MARSCHKE: My comment would be I didn't find that information in the OTIB. And if that information could be, you know, if I'm correct, and it's not currently in the OTIB, that information I think would be very

enlightening to put, you know, because it seems like you're selling yourself a little short here in the OTIB with all the thought processes behind your selection and so on and so forth. And that's why when I say making it harder, making the OTIB more bulletproof, I think that's, a lot of our comments are geared towards that aspect of it.

MR. CHEW: I would make a comment. Jim and I were at the meeting when we first met with the Council for Protection of Worker Rights. At that time I was able to have only at that time, only at that time, to have particularly the Savannah River information. I think Jim will recall I was able to separate out five different categories of workers compared to the all monitored worker. And I even had that, I brought my slides that I used, and I can show that to, I'll just turn it around. I know you folks cannot see that, but this is by construction worker only.

What this shows, the graph shows interestingly by certain years, certain construction workers clearly got higher. A labor category had much higher exposure. This

is just compared to each other. So it was not always consistent that pipefitters were always the highest.

MR. MARSCHKE: No.

MR. CHEW: You knew that, too. So I think if you really looked at the overall effect of the multiplier that will be applied to the unmonitored worker for all year, for all year, you're going to be pretty well convinced that you are pretty much with the claimant favorable.

Arjun, this is the slide I used in the Council for Protection of Worker. I did not make a copy.

DR. MAKHIJANI: I think you can e-mail it if you have. I was going to say, Mel, you made a very cogent argument. I haven't seen information, but we have somebody from CPWR here who would be useful for us to hear his reaction to what you've just said.

MR. CHEW: Are you talking to Mr. McGowan?

DR. MAKHIJANI: Yes.

MR. McGOWAN: I'm much better at interviewing workers and doing exposure assessments than I am in all this mathematics

that most of you folks enjoy. I do know that there are a number of instances in which construction workers had security badges issued, but they were not radiation monitoring badges. So I think you have to be somewhat clear in your analyses of information is what kind of badge you're actually talking about and did that person actually have a radiation badge.

Also, in many instances, not necessarily at Savannah River, where individuals, construction workers, were pulled. They had to take their badge off before doing certain things or they would be laid off. You either take your badge off and go and do this task or you're laid off, and you're not coming back. So people were working under circumstances that would have given them a very high exposure but could never be recorded. So those are the kinds of things you see when you talk to the actual worker and that may be off what we're talking here, but that's the kind of thing that you see.

MR. CHEW: Would you, in our interviews

occasionally we would hear some kind of anecdotal referencing about asking to remove badges. There's been no clear evidence that this was a consistent habit or even anything that we would know how to work with. I'd like to mention that we weren't short of data.

I think Jim knows that I delayed as much as I can because we had a team out there trying to gather as much data at that time. And many of the coworker studies hadn't been done even or since, so in order to do OTIB-0052 we basically went out and derived the data. Surprisingly enough, I think you saw from the OTIB itself, we have just external for all monitored workers over a million data points, and for construction workers we have 216,000 which represents 20 percent. And that's probably not unreasonable thinking about the amount of construction worker versus other workers.

And also similar kind of numbers for internal exposures, too. That was probably the hardest thing to get. The Oak Ridge complex because of the work that was done with Donna Cragle and the studies with the CEDR

database, the OTIB has fairly good records on construction workers. But we had to go down to the level of detail of finding employee numbers, job code numbers, department heads, the department numbers to be able to pull out the right construction so we can always be clear that we are clearly pulling up construction worker data.

DR. NETON: Can you maybe clarify something? Early on the thrust of this project was to look at building trade workers who were not primes. The thought was that the prime contractor or trades workers probably were monitored or it was thought that they were monitored better than maybe the subcontractor building trade that was brought in to fill in the gaps so to speak. And I've forgotten. It's been a long time since I looked at that. You were not able to tease that out at all the sites because the data just weren't there. But where you were able to tease out the exposures for the prime contractor building trades workers versus the ones that were the subcontractors did you notice any differences in their exposure patterns?

MR. CHEW: I think where we probably -- and that's a good question -- probably the Oak Ridge complex was the easiest way to pull that out. And I'd like to add one thing in going back to the interviews. Many of the construction workers would -- and I'm going to exaggerate this here -- one day they'll be working for a subcontractor, the next day they'll be working for a prime. So it almost didn't make any difference here. And especially it was the way that they were able to receive their badging and getting into the fenced areas. By and large I would say in general what we were now looking at the data with the question you asked, the people who worked for subcontractors were probably, the doses were probably smaller actually --

DR. NETON: My thought was --

MR. CHEW: -- and it would be expected to see that, yeah. Because once they brought them in. There was a couple of comments in your --

MR. McGOWAN: I'd like to comment on that if I can.

MR. CHEW: Sure.

MR. McGOWAN: There are a number of individuals, for example I know at Oak Ridge, who spent their entire working careers at Oak Ridge as construction workers even though they were considered to be transient employees. You have some people that had many, many years of work there that would not have been thought of in that fashion. You probably have a bigger dataset at Savannah River from the Fayerweather data than you would have, say, at Oak Ridge.

And at Oak Ridge, we know that there are individuals like the supervisor of the work crew would bring in a whole busload in a bus with the windows painted black of individuals and bring them to a particular location to work. None of them had security clearance. None of them had badge, whatever. They did the work in that location, were trucked back out by that person. There's no record of that.

MR. CHEW: And I appreciate what you're saying here. I'd like to address that. We actually did work at the coworker data. As a matter of fact we actually had looked at the

analysis, and the Fayerweather data really does not give us the breakdown of what we looked at. As a matter of fact I noticed in your report you even mentioned that the Fayerweather data really has no additional contribution or make any significant difference than in the SC&A report.

MR. MARSCHKE: We looked at the Fayerweather data which we got from the center. There was no breakout by construction worker versus non-construction worker so we couldn't break it out that way. But what we did was we compared all the workers to the HPAREH data, and we found, you know, we have a plot in here in the report which kind of shows that the Fayerweather data tracks the HPAREH data but it's lower.

Generally, the Fayerweather, at the 95th percentile, the Fayerweather data is slightly lower than the HPAREH data. And also at the average, and this is for all workers because the Fayerweather data does not identify the occupation of the workers. But what we did, when you look at the figure in here, you're three, two, four, you see that

the Fayerweather data, when each HPAREH data goes up for a year, the Fayerweather data goes up. But it's always a little bit less than the HPAREH data.

DR. MAURO: Page 33 of the report.

MR. MARSCHKE: So basically, that information, or any discussion of the Fayerweather data is missing from OTIB-0052 and in that, you know, I think something should be said about it. Whether or not it changes the end results, you know, or if it does the end results, it may change the 1.4. It may drive the 1.4 down as opposed to increasing it.

MR. CHEW: Well, we didn't go to that level of analysis. I appreciate your doing that, when I saw that. We abandoned it fairly early because we weren't able to break it out by construction, and we needed, that was clearly what we needed to do. So if we didn't do that then we wouldn't be doing (unintelligible). That was the whole point here.

I'd like to just go back to a little discussion about the Savannah River data. I mentioned about the canyons being where the

two areas, but also remember people working in those particular canyons would show high doses for those particular years. Clearly, we asked the question, they had to be Q cleared, and they had to have security badges along with their film badges.

So I think just to reinforce the likelihood of an unmonitored person falling in a grouping of less than 95 percent would be highly unlikely.

DR. MAURO: So the point is that if, in fact, all the construction workers, trade workers including all the pipefitters were, in fact, all monitored, and all of a sudden that data showed up, you're expectation of their distribution would be lower than that because the ones that we happen to have are the ones that were monitored. And the reason they were monitored was because they had job responsibilities that were putting them in greater harms way from a radiological point of view. So what I'm hearing is that this, they're coming in high because they were given jobs which were unusually more radioactive.

DR. NETON: Mel was saying for that

particular event, not universally.

DR. MAURO: Okay.

MR. CHEW: Right, if you track the average pipefitter through a majority of the years, they were below the unmonitored workers.

DR. MAURO: I understand that, but it goes to particular years.

MR. CHEW: Sure. Sure.

When I think of, that was the first, we've already had this discussion because I think that was one of the key points that you would like to have this explained. The other part of the matrix, do you feel there is any other one that you'd like me to tell some detail?

DR. MAKHIJANI: Before we move on from Savannah River I think the example you gave is a good one and you make a very plausible case that if they were going into the canyon area and doing work on the piping there, that they would likely be monitored as well as have security badges.

But the counter example to that would be something like the tank farm in the 1950s and early '60s. There are a lot of leaks in

the first, I think nine of the first 16 tanks leaked at Savannah River. And then when they built the next generation of tanks it's much better. So they have a lot of workers who were kind of digging up stuff, cleaning up stuff. They had a lot of subcontractors at Savannah River site.

This is one of the reasons that I kind of tried to insist on that tank farm database, they didn't record all of the incidents. I mean, in the databank itself it says we didn't record everything that we considered significant, but it got not criteria. And in those kinds of circumstances, I kind of wonder how much of this analysis actually applies, especially if you don't address incidents in TIB-0052.

So you have an unbadged worker who's kind of doing clean up, and who is a subcontractor, and he's there as a day laborer brought in by some company, not tracked by a union, especially the Savannah River site. And so you've got multiple levels of problems in how you apply this.

MR. CHEW: I'm glad this, Arjun, I'm glad

this morning we had the discussion about OTIB-0020 and it also was ancillary leading up to it because that's really important. Remember, we're focusing on the unmonitored worker that's talked about. And now we're going to be assigning -- I hope I say this correctly as a dose reconstructor -- we're going to be assigning that unmonitored worker the 95 percentile of the all monitored worker data which this data supports, and multiply that time 1.4 to find that.

Which I'm now going to come back to you, Arjun, and is it plausible that you're going to find an unmonitored worker if that's a scenario that you can describe that that's not claimant favorable. Well, we feel it is claimant favorable.

DR. MAKHIJANI: I think so. I think when we looked at Y-12, and we tried to subject it to the test to see whether workers were widely monitored in the 1950s fell into the high dose categories when they started being monitored in the 1960s. We did find them.

So here we're talking about non-prime contractor workers. Here we're talking about

prime contractor workers. Here we're talking about deliverers who are there for temporary jobs who might be doing clean up in radiation fields that were quite high. Sometimes they were ten R per hour, per hour. That's documented in the databank, and to the extent that I reported it accurately when I did the study, you have those numbers. And in those kinds of circumstances with the special kinds of geometry that you have, I think at least that the case needs to be made that this is adequate for those kinds of circumstances. Because I think that in the '50s especially, because you make the case that in the '50s construction workers would be working on cleanup jobs, and I'm not sure that that's --

DR. NETON: No, no, I don't --

DR. MAKHIJANI: That's somewhere in the matrix. That's there somewhere in the matrix. That would generally be the case. You don't have to worry. But I don't think that's necessarily the case.

MR. CHEW: But we still have in those early years, too, a significant number of exposure assigned to the all monitored worker. And

that's where --

DR. NETON: There are exposures here being assigned in the 1950s, about 1,000, 1,500 per year to these workers. Now you're suggesting there were unmonitored construction workers working in Ten R fields, no badging considerations at all. I've just not heard that anywhere else before. I've never heard that.

DR. MAKHIJANI: I'm not suggesting that they were not badged. I'm pointing out that there are, in the '50s, we know of situations where there were workers in relatively higher exposed categories not deliberately not badged, but people were learning things.

People were, at least that was my impression from having, that was my conclusion going away from White, having looked at the White data a lot. They were trying, and they were learning things, and they were finding the people to badge. And often they were right, and sometime they were not. And that's the kind of, if that was the situation with prime contractor workers, I'm raising a question rather than making a statement.

DR. NETON: This is no different than the discussions we've had on monitored versus unmonitored prime workers because what you're saying is we have an example here where there's a clear dichotomy between monitored workers and building trades workers. Building trades workers are much lower on average than the prime contractors. And what you're suggesting is that they didn't, the preferentially only monitored the lower exposed --

DR. MAKHIJANI: No, I didn't say that.

DR. NETON: Well, that's what would have to happen for that comparison to be invalid, that they would not be monitoring workers that were more highly exposed.

DR. MAKHIJANI: I think they did not monitor some workers who were highly exposed and didn't monitor some workers who were highly exposed, yes. I'm not saying that they systematically excluded highly exposed workers, of course not. We know that that isn't true. But we do also, at least I feel from having looked at the data, that there were cases in higher exposure categories that

weren't monitored in the '50s.

DR. NETON: We're using the 95th percentile distribution as well so --

MR. CHEW: But, you know, Arjun, we also remember that we're talking about claims that came in, coming in, that somehow we identified that that person probably should be monitored. And so now you have to look at that particular individual claim to see where the data, whether the specific TBD or TIB explains how by his or her job description we're able to assign that unmonitored exposure to him.

Arjun, I'm going to send this particular graph down to you to show you some of the history by year. And so clearly, some of this beginning in the 1940s, people were monitored. And so we have information on people both construction workers and all monitored workers dating back. And if you really look at the graph itself, it's very interesting. It's going to tell us a story about the development of the weapons program like I started talking about this morning.

And we tracked, the exposures were tracked to see how the development occurred.

In the early years obviously zero reconstructing and it started to build up, you know, some of the early work at Atomic Laboratory, the Hanford, you know, the separation processes. And then DuPont was involved with the early separation processes at Hanford. And then they took it down to Savannah River some of the separation processes were better well defined. And so they were able to build for their system.

Now to answer some of your questions here, you're basically coming up with is it really plausible, can I develop a scenario like you just described? You know, I have a person who worked in high radiation field for a significant amount of time who really was unmonitored. So will you have a way to get, find exposures to that particular claimant by taking the 95th percentile times 1.4. And do you think we have bounded it? You think?

DR. MAKHIJANI: Two things, if you look at the 2007 Inspector General report that just came out about bioassay not external dose.

DR. NETON: Current exposures.

DR. MAKHIJANI: Current exposures but under

current rules. Are the rules being followed? Are the workers being separated according to low and high exposure categories by current criteria? Which would also be, you know, you're doing the best --

DR. NETON: I found it convincing that the highest exposed workers were monitored in the Inspector General report.

DR. MAKHIJANI: But are the workers --

DR. NETON: I thought that was the conclusion.

DR. MAKHIJANI: That's not the point. You don't know among the people who were entering radiological areas who were not monitored that's part of the point and studied the report. I've scanned it --

DR. NETON: I looked at it, Arjun, and I don't see that you're making a point by citing that report. Go ahead.

DR. MAKHIJANI: Maybe not. And maybe you studied it better than I have. But I think, at least in the '50s and '40s, to step away from the report which you read and I have, I'm not saying that -- I think Steve put it well when he gave an overview that there's no claim

in our review that this isn't broadly claimant favorable to the vast majority of workers that we're talking about. We're not, that's not the claim.

I think that overview statement was right, and we agree with TIB-0052 on that. The question is are the categories of workers, not just random people in the table, are there categories of workers that TIB-0052 would not pick up who are unmonitored construction workers. And I think that for certain times and certain types of workers that this is at least plausible, and this idea should not be rejected out of hand.

DR. NETON: I think it's speculation. We can't live on speculation. If you look at the comparison in the data, there's a factor, by eyeball here, of at least a factor of four difference between the construction workers and the all workers. And we're comparing the 95th percentiles that are a factor of four different, I have trouble believing that that does not indicate that we're providing a generous margin of dose to those workers who were not monitored. And probably for the most

part many of them didn't need to be monitored. But we're giving this to the people who probably should have been monitored a factor of four higher than what their counterparts were receiving.

MR. CHEW: And the upshot of that is that the unmonitored worker based on this process is going to get more exposures than the monitored worker.

DR. NETON: No, what I'm saying --

DR. MAKHIJANI: Yeah, I recognize it's --

MR. MARSCHKE: If you look at 152, if you look at the Oak Ridge data, I mean, from 1972 on basically the ratio of construction worker to all monitored worker is greater than, it's 1.5 or greater. And so how do you, if you look, one of the questions is how did you settle on 1.4?

MR. CHEW: I'd like to answer that. It's a very good question. There was a considerable amount of discussion when 1.4 was arrived at. You pointed out some very good information that especially in the latter years, most people were monitored and construction workers. They worked multipliers even much

greater than 1.4, 1.5, 1.8, 1.9. As you can see here we even listed them.

But why we did not include that in the 1.4 is you really looked at the exposure itself, exposure itself. Then the value of the exposure at the 95 percentile, they are down in the hundreds or less than a hundred millirem. And we thought it that no matter what you did it would probably be not in the compensable category. So we focused in on where the exposures were of a higher value in the rem categories --

DR. NETON: There's also the monitoring all the workers. We've got the entire workforce monitored. Badges were handed out very readily to all workers at that point. Construction workers who were brought in maybe for specific jobs would be higher at that point, but they're monitored.

MR. MARSCHKE: See, there's a lot of stuff that went into the selection of OTIB-0052. And one of the selections is 1.4. A lot of thought processes went into this is not really reflected in the document itself.

DR. NETON: Yeah, well, that's the problem.

We're writing documents for our own guidance.

MR. MARSCHKE: So when we look at it we have these questions, and again, we looked at it. We could see that, you know --

MR. CHEW: Steve has a very good point. When we first, actually for all the years for all the sites we studied, we actually took the ratios for every year. Most of them were below one. And you know that already. Well, I said, well, is that the way to present the information.

Let's really step back and take a look at it. How many of them are above 1.1, 1.2 or 1.3? Where are we going to see the trend of what a reasonable coworker adjustment factor would be? And we looked at all the numbers and the exposure itself in consideration. And then 1.4 was consensus-wide, the reasonable adjustment factor here.

MR. MARSCHKE: The selection of 1.4 to me is very much subjective and that's why we did this proof in the pudding type where we ran the samples to see how robust the 1.4 was. And we were, I guess one could say pretty well pleased that for most of the samples that we

ran -- I think we ran about 60 samples. Twenty at each of the three sites that we looked at. And we only had a handful or so that basically the OTIB-0052 methodology produced lower results than the measured results, and then not more than a factor of two lower. So it seemed to always produce either doses that were very close to or above what the measured doses were. So but again, there's a lot of questions, I know there's a lot of questions out there from the meeting we had with the center as to how the 1.4 was decided upon. And because there are a lot of numbers out there which are greater than 1.4.

DR. MAURO: When you say they're greater than 1.4, is for the ten year, for duration of the --

MR. MARSCHKE: No, that's just for --

DR. MAURO: I think the interesting problem is this. You have a worker, and what we have seen here is that it's possible that in a given year, a given worker who was not monitored may very well, it's possible, have gotten exposure more than 1.4 times, that is, if you use this method for that year. Because

you're operating at the 95th percentile the probability that ten years in a row --

DR. NETON: No, I understand that.

DR. MAURO: -- that's not going to happen. So there's no doubt when you're looking at a stretch of time for a worker where he's there for every year, and we're going to assign him every year not the 95th percentile year after year, 1.4 times year after year. So I have to say when I look at that I say I buy that. But the dilemma then becomes what about the person that was just there for one year.

And you apply this, and he's a pipefitter. It seems to me there's a very real possibility that he's just -- and this is going to be a rare occasion -- and he was unmonitored, and so it's almost like when are we conservative enough. From reading the report and asking questions just like we're asking now, I am convinced that over a stretch of time, the methodology as you've developed, the chances that one person year after year after year after year who's unmonitored go the upper 95th percentile times 1.4 for every one of those years, the probability of that

occurring is zero or approaches some astronomically small number.

But for any given one year, I would say there's a very well possibility it could have happened to some people. It might have been just for one year. Is that good enough? And that becomes almost like a judgment call.

DR. NETON: The question is though Mel has pointed out a couple of instances where those couple years are high because it was a point where we believe that they would have been monitored so that kind of goes away.

MR. MARSCHKE: They were doing specific tasks.

DR. MAURO: They were doing specific, that's where --

DR. NETON: -- job and we can account for that at the Savannah River site. But I'm not sure how many --

DR. MAURO: Well, that person never existed. In other words, that person doesn't --

DR. NETON: Those people probably don't exist.

MR. CHEW: And, John, look at this tail here. Remember, if you look at the DOE

complexes in the graph it's kind of interesting, the exposures here and tailing off because the Cold War ended here, and then the breakdown. These doses, even though where we talk about numbers, are low. Even though you can multiply times two or 1.81.9, whatever number you want. That's why we just kind of... But we presented in the graph because it was there so that's our actual data. We did focus in clearly on this particular period of time where the exposures are significant enough that it would make a difference.

MR. GRIFFON (by Telephone): Mel, this is Mark Griffon. Been listening in to this. The one question I had, in the overview Steve mentioned this concern that SC&A has about the, and I think John just sort of highlighted again, the sort of category for less than five-year period or three-to-five or whatever the cutoff there was.

And that's what John was sort of raising where when, would be conservative in that regard. I just wanted to, I wondered if you assessed what the magnitude of that population could be because if I'm looking, I

have some numbers for a couple sites. And it seems to me for some of the construction workforce you could have a fair percentage of workers that fall into that less than five year category. It's not that unreasonable.

I mean, the Nevada Test Site for instance in the medical monitoring program I just looked up some numbers. It was like 850 out of 2,700 that reported less than five years work. So it's not like all these guys have ten, 15 years at the site, so a little more, at least for some of the sites. I wondered if you assessed that at all in your analysis in TIB-0052.

MR. NETON: Well, I don't think we did, Jim, I don't think we that we looked at it in those narrow brackets, but the example you used, the Nevada Test Site, it comes to my mind that most of those people were monitored after a certain year. We have very good monitoring --

MR. GRIFFON (by Telephone): Yeah, and they could have been, yeah, I didn't crosswalk that with whether they were monitored or not, that's true.

DR. NETON: This doesn't make a difference

in the dose reconstruction. The thought comes to mind if a person only worked a year or two the chance of their dose becoming high enough to be compensable is pretty slim. But that's probably not a good argument to make.

DR. MAKHIJANI: We actually have a number here for Hanford from Eula Bingham. I mean, we have independently verified it, but she brought this up. You know, the short-term, long-term thing came up during our interview with CWR, and I just, so we asked, you're expressing the concern that workers who were there for shorter periods may have been there when the factor of 1.4, when 1.4 factor may not apply. So we asked her that and Eula said, yes, some worked for short periods, some not. At Paducah construction workers average length of employment was about three years. At Hanford it was 15 years. Oak Ridge was 17 years. So it's all over the map, and so you actually, if the average length of employment for construction workers is three years, then you have a problem for some groups of workers.

DR. NETON: Only if they were unmonitored.

DR. MAKHIJANI: Then you have this whole

thing about, you know, the other thing that came up is that DOE has even lost track of the subcontractors let alone knowing where workers are. So the whole question of whether you call it your records, who was monitored, and I think especially for the early years, I don't think that they can be dismissed saying that we knew who was being monitored. Well, at Rocky Flats we have documentary evidence that even though the Health Physicists in the field knew that the people who were exposed to plutonium tetrafluoride were at risk of neutron exposure, they decided not to monitor the people in Building 71 for neutron exposure until 1956. And that is in the history of the Rocky Flats site. So it's not necessarily that the Health Physicist didn't know what was going on, but it was management decisions how to do certain things. And when we have that documented for secure workers in the '50s at Rocky Flats, I think the burden of proof in the way I read the regulation, had to be, at least for the '50s, on the government to say, okay, we know that everybody with high exposures were monitored and this is going to

cover it because I think --

DR. NETON: Well, you're challenging the entire coworker approach. This just goes beyond, this is the entire coworker model approach then you're challenging.

DR. MAKHIJANI: Well, for a certain period --

DR. MAURO: Short term.

DR. MAKHIJANI: No --

DR. NETON: For any period really.

DR. MAKHIJANI: No, I think, no, the reason I've said that if you're adding 95th percentile, then a factor of 1.4 over ten-year periods, first of all it's a very long period, then the probability that you're going to be on the short side is very low.

DR. NETON: Well, I don't follow that argument, Arjun. I mean, you're saying that's okay, but then just before that you said that we don't even know who was monitored and when and why. I mean, you've got two extremes you just pointed out to me, and one is right and one is wrong. I mean, I don't understand that.

DR. MAKHIJANI: I think that my statement is

a little more nuanced than you hear them.

DR. NETON: I don't know. We don't know who was monitored at Rocky Flats. They purposely didn't monitor them, and they just ignored it because for whatever reason they made a management decision not to.

DR. MAKHIJANI: I made a more careful statement about what's in the history of Rocky Flats about who was monitored. Now, this is not Arjun Makhijani waking up one day and making a decision about what happened over there. We do know that in Building 71 neutron monitoring started in 1956.

MR. CHEW: And we're not here to argue about Rocky Flats again because we've done that for two years here. I would like to say I would highly unlikely that a construction worker would be working in front of plutonium fluoride. I just want to discuss that point, and let's dismiss that. Let's focus in on really construction workers.

And I have the categories here, and what are the likelihoods of them really being exposed to a significant level above the all monitored worker which is now the coworker

study here multiplied times 1.4. That's really the bottom line here, and we need to focus on that.

DR. MAKHIJANI: Let us focus on that because just now or twenty minutes ago, the argument was made that if they are in a secure area, they'd have a security badge and a badge. And therefore, and everybody who went in there, therefore, by analogy construction workers would also have been badged.

Now I'm saying that you're in a secure area in the '50s. We have in an area where there were known to be neutrons we had unmonitored workers in the most secure area at Rocky Flats. So I'm just picking up your --

MR. SHARFI: SEC issue versus a --

DR. MAKHIJANI: No, no, no, it's not an SEC issue.

DR. NETON: Why were they not monitored though, Arjun? You didn't finish the story. Because they were judged to be below a certain monitoring threshold.

DR. MAKHIJANI: No.

DR. NETON: Yes, they were. They were judged to be below a certain monitoring

threshold.

DR. MAKHIJANI: I have the history in my --

DR. NETON: Well, they didn't not monitor because they were the most highest exposed workers. I mean, that's the point is that they were judged to have an exposure that didn't meet a certain monitoring threshold, a criteria. And so when you start badging the higher exposed workers, these studies are even more generous because you've got a subset of higher exposed workers, and we're taking the 95th percentile of that. I don't think that they just deliberately didn't monitor the workers in the plutonium facility because they were high. It was a rational decision made why they weren't monitored, and that's the rest of the story.

DR. MAKHIJANI: Well, I don't think that the history of Rocky Flats represents a rational --

MR. CHEW: They came and measured it and so they know what the exposures were, and so they made their decision.

DR. NETON: Yeah, my recollection was that there was a 500 millirem cutoff or something

like that for monitoring.

MR. CHEW: Where the MDA film can --

DR. ZIEMER: Mel, on the histories, to what extent can you identify these individuals? Were they keeping lifetime histories in the ‘50s for these folks?

MR. CHEW: Yes, yes.

DR. ZIEMER: It wasn’t required until the ‘60s. So most of these are actually identifiable people.

MR. CHEW: Yes, they are. Every one of these working points are identified people. We did that, it’s a very intelligent point. No, that was the only way we can get the construction worker --

DR. ZIEMER: Because I know at Oak Ridge, and this goes back to the ‘50s now, you always, you determined on the construction workers by job whether you monitored them beyond even a film badge. And typically you had HPs with stop watches and survey instruments because you were really interested in daily and weekly limits.

And in the early days the limits were not life. There were no lifetime limits.

They were basically weekly limits and daily limits for administrative purposes. But even if you didn't know the identity of a person, you could pretty well guarantee that they're not going to get more than a certain amount a week if they're working in a high dose area. It perhaps was different in other facilities, but I couldn't imagine any worker, say at Oak Ridge, coming in and working in a high dose area and not being monitored.

MR. CHEW: That's our point.

DR. ZIEMER: It would be equivalent of a work permit. You had to have --

MR. CHEW: I know I'm being redundant here, but we are focusing on the person who is unmonitored or would have information that's missing in his monitoring record, that's fair, right? And we are going to be assigning that particular (unintelligible) would be without the information the 95th percentile of the all monitored worker where I think that shows clearly through all of the sites except for the few years that we discussed about.

And wherever, as a matter of fact in our study, when we did the study, every time

we saw that the construction worker data was above potentially the all monitored worker, even at ten percent of the 1.2 times, we clearly tried to identify and go back to know what operations that we know of and try to identify what they did and were the people monitored. And so what was the likelihood of unmonitored?

We've got to also look at some of these particular sites, and the important ones. If you look at Hanford; you look at Idaho; you look at Savannah River, these are the very large sites. And so people can come in and out of all those sites including the deer as you well know. And so there are fences around those particular sites that have the separation and materials here. And so there's clearly a control point where people would come in. And also in the early days both areas were classified and secured area, they would have been monitored.

Anyway, I think, Wanda, if SC&A has any other points on the matrix that we responded that they are still lacking clarification, we have no problem. I think we

discussed the subject maybe to their satisfaction I hope.

MS. MUNN: In skimming down the NIOSH response column to the matrix, it seems to me we've covered in our discussion most of the items fairly well that are mentioned here in one way or another.

MR. CHEW: I'm just kind of curious, I'd like to say something, Wanda. Item number 2-8, you asked us to go look at the HPAREH, I mean, basically all the external doses are from HPAREH. Needs to evaluate other doses like Fayerweather, ABST. Why did you want to put that issue in because you thought yourself it was an issue? I'm just kind of curious why that was in there.

MR. MARSCHKE: Again, to make the document harder. To make the document more, you know, to somebody picking up the document and reading the document who has a knowledge of Savannah River, they know that HPAREH is not the only data source of data out there. So I would think a statement to that effect that we have looked at Fayerweather and so and so forth is basically, that type of statement.

MR. CHEW: Well, see, we happen to know when our initial view graph to Savannah River at the meeting, we also mentioned we had looked at the Fayerweather data. And so a year later after we put the document together, we just, I apologize. We didn't put that in.

MR. MARSCHKE: If that, in fact, is the case when you do look at it, you get results which are similar to what we got.

MR. CHEW: I certainly hope so.

DR. NETON: One issue that we -- I'm sorry.

MS. MUNN: Go ahead.

DR. NETON: I'd like to bring up that we didn't talk about is this finding about that we didn't do the modification that we had discussed with CTWR. I feel like we do owe an explanation for that. It is true that Mel and I and I think Justin Conoyer met with CTWR in Silver Springs and had a very engaging conversation with the folks there including an expert exposure assessors. Primarily an industrial hygiene background, but they brought to the table some very good expertise in exposure assessment particularly when you're dealing with air sample data.

And we discussed a number of options as to how we could move the internal dose assessments forward. And after looking at a lot of air data, we decided, well, maybe it would be more appropriate to increase the GSD on our, geometric standard deviation, on our values for internal and apply them that way and take a 95th percentile and reconstruct doses that way.

And as it turns out when went back, and we tried to apply that to our dataset, we ended up with implausibly large values. I mean, just tremendously high intake values that made no sense in light of what we know about the general exposures at the plant. And that’s when I started having discussions with other folks, Mel included, to say, hey, we have internal dosimetry bioassay data where we can differentiate just like we did with external construction workers, non-construction workers.

And that’s where we ended up, using the real data which the nice feature is that it takes care of the, you don’t have to extrapolate from air sample data any more,

these extremely large potential geometric standard deviations. You have bioassay data from people that tightened up the distribution substantially and gave us what we felt a much better representation of the exposure of this cohort that we're dealing with. That's the nutshell explanation for that.

MR. CHEW: I would like to add one more to consider. That was quite a discussion at the meeting. It also eliminated by using actual bioassay data any issues about different breathing rates and things like that.

DR. NETON: Right. Breathing rates go away, and the oronasal breathing goes away. The number hours worked in a week goes away. All the correction factors that we were talking about went away. The bioassay data is an integrated sample during the activity no matter how long or how hard you breathe.

MR. CHEW: But it forced us to spend a considerable amount of time --

DR. NETON: We put in a lot of effort.

MS. MUNN: As long as you can get it. Getting it there is the important thing.

John, is SC&A okay with OTIB-0052?

DR. MAURO: Steve, are there any other items in here that you think need to be raised?

MR. MARSCHKE: We haven't talked about neutrons yet, and OTIB-0052 is also quiet on neutrons. And we do have one comment and one finding in the matrix where we basically, we raise the neutron issue. And you have a response here, and I guess you're applying the same 1.4 multiplier to neutrons --

MR. CHEW: To the total exposure.

MR. MARSCHKE: To the total exposure which would include the neutrons as you would apply just a straight gamma dose. I don't know. Do we want to get any more into that or --

DR. MAKHIJANI: Steve, just a memory question. You wrote the report so I don't remember. Didn't you find that in some sites neutrons were included and some sites they were not? That's my memory.

MR. CHEW: That's true.

DR. MAKHIJANI: So I think it's not consistent that the 1.4 is being applied. Am I wrong about that?

MR. CHEW: No, because if you compare site to site construction worker or all monitored

worker, that individual site stands alone here. So if neutron doses were applied, it would be applied both the all monitored worker and the construction worker for that particular site. Now, I think Savannah River was the only one we really found that had neutron doses. And we really did not find much neutron dose exposure to construction workers. There's another claimant favorability because the all monitored worker had more neutron exposure.

DR. MAKHIJANI: But you're not applying the 1.4 to neutron doses. I didn't understand. It's just a question. I don't have a statement about it.

MR. CHEW: You apply the 1.4 to the total.

DR. MAKHIJANI: Including from all sources.

MR. SHARFI: The deep dose and the neutron dose, not the shallow.

MR. CHEW: Right, not the shallow.

DR. MAKHIJANI: I think it goes in the analysis that in developing the 1.4 that in some cases only the deep dose was counted, and in some cases the neutron dose was counted. There's some finding there that I'm not

remembering correctly now because I totally read the report from end to end recently, from beginning to end I should say.

MR. MARSCHKE: The Rocky Flats data the data that was used in the Rocky Flats analysis, I think had the neutron data --

MR. SHARFI: In that which would be the gamma plus neutron.

MR. MARSCHKE: And if you look at the Rocky Flats coworker OTIB as I recall, there are two or there is a construction worker table that has columns for both for gamma and separate columns for neutrons. So that's clearly they're applying the 1.4 to both.

MS. MUNN: To total dose, total dose.

DR. MAKHIJANI: But we only found that at Rocky Flats, right?

MR. MARSCHKE: I think that was only at Rocky Flats where really the neutron (unintelligible). At Savannah River I think they, each (unintelligible) characterized the doses as penetrating dose.

MR. SHARFI: I think they're separate. They have an open window, a shallow and a neutron report.

MS. MUNN: Regardless, you're still comparing site worker to site worker not site worker to some other site worker. So you're still comparing badged at this site with unbadged at this site. So you're covering the same ground no matter what.

DR. MAKHIJANI: That's right.

MS. MUNN: With that let's take a quick 15-minute break and then we will come back and address TBD-6000 briefly. We'll have a wrap up of action items, and we'll talk about one or two other things that we may not have had an opportunity to touch on this morning.

DR. WADE: We're going to take a brief break so we'll mute the phone. We'll be back in, what did you say, five or ten minutes?

MS. MUNN: Ten minutes.

DR. WADE: Ten minutes.

(Whereupon, a break was taken from 3:40 p.m. until 3:50 p.m.)

MS. MUNN: As we reconvene there's one item which we did not have an opportunity to touch on before lunch which I had hoped we might have some discussion on. And that's where we were on the few items that were still

outstanding on the first matrix. But we won't address that right now. I'll just postpone that a little bit until we have addressed the couple of immediate issues that we have before us, the first one being a discussion of TBD-6000.

DISCUSSION OF TBD 6000

That's recently, as you know, out and operating. And I think John touched earlier on one of the actually administrative issues that are before us with respect to Appendix BB. I believe that you all received a copy of the memo that John sent out asking about our authorization for them to continue their expectation in pursuing a review of the appendix to TBD-6000.

John, would you like to expand on that just a little?

DR. MAURO: Yeah, right now based on the marching orders given to us what we're doing well along is reviewing TBD-6000. TBD-6000 by the way is the generic guideline for all metalworking AWE facilities. It doesn't include refining, but simply the metal that's being worked.

And it's a generic model that was developed by Battelle and is intended to be used where you don't have site-specific information. Accompanying TBD-6000 are, I believe, about 15 appendices each one dealing with site-specific information. That sort of sets the stage. Now where are we?

We are performing an in-depth review of TBD-6000 which in effect says here are the default airborne radionuclide concentrations of uranium, of thorium, recycled uranium and its composition that we believe represents a plausible upper bound for different categories of workers for different time periods at these AWE facilities. And all of this data was gathered basically from a review of work by Kingsley and Harris. It's one of the definitive pieces of work on this subject.

As of this date we've carefully reviewed Kingsley and Harris and affirmed that the numbers that have been adopted represents the upper end of the numbers there for airborne exposure, inhalation exposures, but we have also determined that there are other sources of very comprehensive data in addition

to Kingsley and Harris that are not cited in that TBD that we are looking at also.

Of particular relevance is the report that we've talked about in the past that I referred to as the Adley, A-D-L-E-Y, Report, and also there's a lot of data from Simonds Saw that is very valuable. So there are other source documents beside Harris that we're using to evaluate the airborne dust, default airborne dust loadings contained in TBD-6000. We'll be reporting on that.

From the point of view of external exposure, there are default values for if a person were working with uranium, enriched, recycled, depleted, whatever form of uranium and at different geometries, there were billets, rods, ingots, there's a wide variety. And in the TBD they have a long list of these different types of geometries of uranium that could represent a source of external exposure. We have already in the past ran our MCNP calculations to see what the radiation fields are for some of those uranium chunks and where we've matched their numbers. So for the ones we've looked at so far, we've confirmed that,

yes, we agree that these are, in fact, the radiation fields you would get if one foot away.

MS. MUNN: They're tracking well.

DR. MAURO: They're tracking very well.

So right now the status is that the external so far is tracking well, but we're doing more work. We're still looking at other geometries. The internal, we confirmed that they used the Harris Report, very sound source document for the early years which is especially important.

But we're also right now in the middle of that as we also comparing those data against other important source documents which are not cited in the TBD. And where they'll have all of the TBD-6000 evaluations, all the work, completed in time for an oral presentation for the September 4th full Board meeting.

MS. MUNN: Full Board call, September call.

DR. WADE: Full Board call.

DR. MAURO: Did I say call or meeting?

DR. WADE: You said meeting. You're right. It's a meeting, but it's a phone call.

DR. MAURO: But more important than that from our perspective because TBD-6000 in many respects is an aggregate, a compendium of information that we've already, that we've looked at in the past as part of the work we've been doing all along on AWE sites. What is new, and I think of great importance when we last met, when Senator Obama's, when one of his staffers read a letter, was Appendix BB, which is the General Steel, GSI. Isn't it General Steel Industries?

MS. MUNN: Correct.

DR. MAURO: And that is a new problem. What I mean by a new problem is General Steel Industries, its job was to do nondestructive testing of large metal components which included uranium. But at the same time that was only a small part of what they did. They also did nondestructive testing using a 25 meV data chart of a whole broad array of components made of different alloys. So what we're in the middle of doing is evaluating that, and at that point I'd like to pass the baton to the fellow that's doing the work, who's on the phone, is Bob Anigstein. He's

our physicist that runs MCNP which is the definitive model.

DR. ANIGSTEIN (by Telephone): Excuse me. I don't run MCNP --

DR. MAURO: Okay, that runs the program that our MCNP program because we have other people than help us. With that, Bob, could you tell us where you are on that part of the evaluation?

DR. ANIGSTEIN (by Telephone): Sure --

MS. MUNN: Bob?

DR. ANIGSTEIN (by Telephone): Yes.

MS. MUNN: Before you begin this is Wanda. It wasn't clear to me that all of the different types of alloys and components that were being looked at were, in fact, materials that were covered by the program. Are we talking about, I know General Steel did both types of work, public and private, and are we looking, I trust we're looking only at materials and components that were included under DOD programs or DOE programs.

DR. MAURO: Perhaps I should answer that, Bob.

DR. ANIGSTEIN (by Telephone): Yes.

DR. MAURO: We've been operating under the premises very similar to what we did under the Dow investigations. That is, if an organization, private sector organization, is given a contract to provide a service to the weapons complex similar to the way Dow was given a contract to roll some uranium, it at the time of that contract there were other activities going on within that facility involving radioactive materials, such as at Dow at the time they were rolling uranium they were also making thorium alloy.

Any exposures that workers would experience during the covered period would be included. So even though it was, for example, the thorium operations at Dow were not AEC operations. They were occurring at the same place at the same time that the AEC operations were taking place, but as a result.

MS. MUNN: So we can segregate them?

DR. MAURO: So now swing over to General Steel Industries. We've been operating on the premise that at the time that people were performing nondestructive testing of uranium slices, billets, that came from I believe

Mallinckrodt, they were also, that was just one more piece of metal that was undergoing nondestructive testing. So what we've been doing is evaluating the radiation.

So what we see is well, we have a worker here. His job is to use the Betatron to irradiate and get a picture of the imperfections in a uranium slab. Well, right behind that there may come a component, a steam generator, a pressure vessel or some other large component. He just moves it in and does it, and then another uranium may come in. So the operation, the way we're looking at it, the operation was an ongoing operation where components were moving in and moving out getting X-rayed.

So what we're doing right is evaluating what the -- and Bob will describe what he's doing -- what the radiation field is due to the photoactivation. That is, when you use a 25 meV Betatron, the energy is so high that you cause activation unlike, you know, neutron activation would occur at low energies, but I think the threshold -- Bob, let me pass it back to you at this point.

The answer to your answer is, yes, we're looking at not only uranium but everything else.

MS. MUNN: All right, thank you.

DR. ANIGSTEIN (by Telephone): Let me start by clarifying my role in the project. My background is in nuclear physics, and I am familiar with MCNP. I haven't taken a course in it; however, the actual runs are being done by someone who is an expert who's been doing this for many years, and who can do this more efficiently and more competently.

We work to together as a team. This is a man by the name of Dick Ulsher*, who's an associate of SC&A, and I pass on the specifications for the runs. He sends me back the MCNP results. We discuss the significance and just to clarify that. I don't want to pretend that I'm and MCNP expert.

What we're planning to do. So far we've done, as John said, we verified this uranium billet because that's a generic case, and, yeah, we agree with it. Actually, our results were slightly lower so we're in the same ballpark. We also verified the gross

exposure rate from uniformly contaminated floor. We're going to do some further work on that, but the preliminary results show that we're in the same ballpark as the rates that are published in TBD-6000, which are applied also to General Steel.

Further than that we did a preliminary run on photoactivation to get that, to do a definitive work on, I should really say photofission of uranium, required the use of the MCNP X, version 2.6, which is actually a beta release. It's not available for general use, but it is available to beta testers, but there's a large number of them.

So obviously, NIOSH has someone with access to a code, and they can, our associate, Mr. Ulsher, has access to that code. And the reason is that there is a version, MCNP X 2.5 that is publicly available. It came from Oak Ridge, at Oak Ridge. However, that does not do delayed gammas. So with the MCNP X 2.6, you can run it for any designated period of time, and it will give you the exposure or dose rate or whatever tally one wishes to use as a function of time following instantaneous

irradiation of the, during the very short period of time, picoseconds or something like that.

And then how it gets activated and then how you get the decay, you know, usually there's radioactive decay, and also possibly a build up of fission products. It does activation and fission products, but for uranium the fission product would far outweigh the activation. For the lighter elements the activation would be important because one is photo induced fission, the other one is the high energy photons knocking neutron out and create a new isotope. We are planning to do those runs.

Right now I'm studying the material we got from Los Alamos at Los Alamos Declassified Report which gives a little bit of information about techniques, radiography techniques used, and probably more important is the worker reports, basically worker interviews as to how it was really done.

And finally, basically we can simply set up the exposure parameters based on the fact that you have a film. You have a slab of

uranium. You have to get a certain amount of radiation through that uranium to expose the film. Typically, it's one rad is a typical number for film exposure. So that tells you how much radiation is coming in at the front end to get the desired exposure at the back end at the film.

So this is all, we did one preliminary run, but this is still in the planning stage to do more once we get definite, because it takes quite a, these runs themselves on a high-speed machine can take days. So we want to get all our ducks lined up and make sure we're using the right parameters so we don't have to repeat it too many times.

And right now we need some more information because based on the ORNL surveys, there are apparently two, at first glance they look similar. They look like the same diagram. When you look more closely there are two different Betatron buildings, and they, where I'm at right now is just giving you a snapshot.

What is a puzzlement is what is called the old Betatron building has two circles, and

it says Betatron One, Betatron Two within that building. So it seems that both Betatrons were located in the same building. What is the role of the new Betatron building I'm not sure at this point. I have to do some more investigation.

When ORNL did it's surveys, both 1989 was the initial survey which resulted in that location being declared a FUSRAP site, needed remediation, even though it was really borderline. There were just a few spots where there was high uranium activity or at least above the DOE action levels.

But then they surveyed the new Betatron building and found no elevated activity both in smear test, in surface contamination studies, in gamma exposure rates, basically it was clean. So we need to delve into that history and possibly a couple of us might make a site visit out there in the near future to see if we can get more information.

And that's approximately where this stands right now. It does not seem to be, it's not clear whether you had two Betatrons

operating in two separate facilities in which case it was suggested that workers in one facility might be getting irradiated when the Betatron was on in the other facility.

But for the both Betatrons were in the same room, clearly, the room would be cleared when either or both machines were on. So in terms of finding out what the exposure rates might be outside the room to workers outside, we still need to collect more information before we can do any definitive analyses. We can do the analyses on the shapes.

The other puzzling thing is that they talk about ingots 18 inches in diameter. There is no way you can penetrate an 18-inch ingot with a 25 meV Betatron. I mean, you would be, your exposures would run for days, and the film would be blurred by scatter. So with the practical limit for radiography according to the Los Alamos report for the 22 meV Betatron was three inches.

According to some scoping calculations that I did based on the fact that there is a current Betatron facility at the Letterkenny Army Depot in Pennsylvania, and they claim

they can do 20 inches of steel. Well, to simply take the absorption, you simply say, well, 25 meV Betatron let's say, the photons, the peak energy of the photon would be like 20 meV. They'd be a little less than 20 meVs is the right number.

And taking the absorption coefficient and the density of uranium and steel, the same photons would penetrate four inches of uranium. This seems to be about a practical upper limit. So I'm not sure how they do and 18-inch ingot. We'll have to look into that further. You can do the edges of the ingot by rotating it or if you can get different angles, but you still won't get the core.

Then in terms of addressing the different alloys of steel the simplest way to do that, we would simply look at the composition of the alloys, and there's hundreds of steel alloys, which just simply using different concentrations of the various metals that go into it, so the simplest thing to do would be to first just do pure metal.

We can do pure iron, pure nickel, pure cobalt, pure manganese, whatever else goes in

there, and see which of these give you a serious problem, which of these leads to activation products. According to the NISOH report the only activation product they found was Iron-53 I believe it was.

So we'll investigate that and see, confirm that and see whether, in fact, there are any others. And if there are, we might run two or three representative alloys, but we don't have to run every single mixture.

MS. MUNN: That's certainly an interesting academic exercise no matter how you look at it. If it were occurring a couple of decades later, I would suspect that we might have a problem with units and metric as opposed to, perhaps not.

DR. ANIGSTEIN (by Telephone): I'm sorry. I'm not following that.

MS. MUNN: Oh, I'm sorry. I was just thinking about 25-inch diameter ingots and wondering if it might be 25 centimeters, but I'm being facetious when I shouldn't be, sorry.

DR. MAURO: I wanted to add a new twist and get some guidance from the working group. I

got a phone call from John Ramspott the other day. He said he had some additional information. I said, okay, whenever you have any additional information please send it to Larry Elliott and to us at the same time so that I'm assuming you've received the sequence of e-mails that I received related to basically the full range of different kinds of materials.

He sent some photographs of the, in any event, information is flowing in. And I guess I'm assuming that we'll take a look at it and use our judgment on what other kinds of analysis might be in order in order to address an issue that might be raised. So what I'm concerned about, I'll give you a very good example.

One of the, I found out is when you take a shot, a picture, maybe take multiple shots. They take a big component. They make little squares out of it. And they take a shot, then they move it, take a shot, move it, take a, and then when they're done, they look at the X-ray, and they may see some flaws. And this may be metal not the uranium, and

they go repair it.

And repairing as I understand it is when they take an acetylene torch and cut it open, and the using a welding fill in the voids or the imperfections so that, that tells me that, okay, so not only is it, and it's done shortly thereafter. The X-ray is taken. They finish.

Now we're finding out that when you do, whether it's activation products that's being produced, and they're decaying pretty quickly, but still a person's pretty up close and personal if they're doing some repair work. There's also the question that, well, if you're using an acetylene torch, that means you're generating fumes. So there you have all of a sudden something we didn't even think about. We have an aerosol.

Now, the first reaction was, well, if it's an aerosol, we have information on what the concentration is for fumes when you're using an acetylene torch. It turns out there's data on that so we could come up with milligrams per cubic meter, and will know what the activity is in the activated metal,

so in theory we could do some internal dose calculations.

MS. MUNN: And hopefully, you can identify early on whether this will be significant or not. If it's not significant, then it's not worth pursuing. If it's significant, then we need to know that.

DR. ANIGSTEIN (by Telephone): But basically, it will depend on is the half life of these isotopes because if they go away in a few minutes or even a few hours, even though they could give an external dose, they're powerful gamma emitters, they just won't be in the body long enough to give any significant internal dose.

MS. MUNN: True.

DR. MAURO: But I want to give you a sense of the scope. So in other words, the scope is expanding, and we want to make sure that everybody's comfortable with that. Starting from just taking a look at a uranium, in other words, that's how it all began. Someone sending a uranium slab for nondestructive testing using the Betatron, now we're dealing with other metals, other alloys, and also now

we're about the repair work that goes with that, so things are expanding.

And right now our plan is to look at all of these issues and report back on September 4th on where we are. I still expect to be able to deliver our report in a timely fashion. I think we said about we needed about, I forget how long, how much time, something like six weeks. I forget the time period we gave for getting this work done.

MS. MUNN: You said about six weeks.

DR. MAURO: Six weeks to two months, right. I think, so we're still, notwithstanding the change in the somewhat expansion in scope, I think we'd still be able to stick with that timetable and deliver our report.

MS. MUNN: The potential expansion in scope has been my concern which is why I did not notify other members of the working group and simply asked the question is there any problem with this. I wanted it to occur at this meeting because clearly scope is important. We don't want to miss something that is significant for our dose reconstructors, but at the same time we cannot go on indefinitely

looking at every alloy that may have ever passed through General Steel.

DR. ANIGSTEIN (by Telephone): We wouldn't do that because as I said, we'll just use the individual metals and see which ones, because there's a very large number of alloys but a very small number of metals actually used in the alloys. So the alloy just behaves as the sum of its components. So if we look at the individual components, we'll have covered everything.

DR. WADE: And let's talk about the two issues. In terms of the expansion of scope at a minimum you need to contact me and let me know. I would suggest that you contact the Chair of the work group, and if she deems it appropriate, the entire work group, because the Board has given the auspices of this work to the work group. But I don't see issues in this, but I think before you would undertake a significant expansion of scope, you should contact me, contact Wanda, and then we can decide on a path forward.

DR. MAURO: Right now Bob is really --

DR. ANIGSTEIN (by Telephone): Okay, also --

can I make a point, John?

DR. MAURO: Yeah, sure.

DR. ANIGSTEIN (by Telephone): In terms of the internal there's really very little work involved because once we've identified which, what are the activation products, which short-lived radioisotopes or perhaps not so short lived, get created, as John said, we have the information on fume concentrations inside the welders mask. Actually we used that in the report that was prepared and published by the NRC so we have sort of a pedigree on that.

And then it's just a matter of looking up the dose conversion factors for coming up with the dose. So that's really, we're talking about for any individual isotope, we're talking about a few minutes, an hour's work if that much.

DR. WADE: And that's fine. I think, John, you need to contact me.

DR. ANIGSTEIN (by Telephone): We're not talking about a large man-hour effort.

DR. WADE: The other issue I'd like to talk about before we lose the currency of this is that the situation was that the Board got a

letter from Senator Obama asking for an SC&A review of TBD-6000 and the appropriate appendix. The Board accepted that, assigned that work to its contractor. The Board also asked that I schedule an update from the contractor on the September 4th call.

I notified John of the fact that that had happened, and he's prepared to do it. Again, this is all done under the auspices of this work group. So whether or not that update happens really depends upon the pleasure of the work group. So I need to know if you're comfortable with John giving the update as the Board had originally asked based on what you've heard today.

MS. MUNN: It's still my understanding that this is being performed under this year's contract.

DR. MAURO: Yeah, we will be able to perform this work under the current budget that we've allocated to Task Order Three because it turns out we're coming in under budget on Task Order Three, and we have some extra resources there, so we're able to do that work under Task Order Three and within that six weeks, two months

time period including the expanded scope that we just were talking about.

MS. MUNN: This doesn't sound like a problem to me. Do either of you see a problem? Mark, are you still there?

(no response)

MS. MUNN: Mark doesn't seem to be there.

DR. ANIGSTEIN (by Telephone): Can I ask a question regarding this? We may not be finished though by September 30th so there may be some expenditures of effort past the current fiscal year.

DR. WADE: That's fine, not a problem.

So the work group now is okay with the work group with SC&A giving this update next Tuesday, and that's fine. That's all we needed to know.

MS. MUNN: Yes.

DR. ZIEMER: A couple questions, Bob, can you say anything at this point about the photofission process? My impression is that's a pretty inefficient process, but I don't know much about it beyond that.

DR. ANIGSTEIN (by Telephone): For uranium you have something a giant quadruple cross-

section resonance that's between, just off the top of my head remembering, something like 14 meV. And since we have copious photons in that energy range coming out of the 25 meV or 24 meV Betatron, you do get significant photofission, much more so than photoactivation of neutron emissions.

DR. ZIEMER: Well, these are relative terms. The photoactivation is pretty inefficient also, and I think you can look at the medical literature. They used Betatrons in this energy range, and they used alloys for shields to shape the fields, and they get activation of those materials. And so there's a literature on that, but it's very inefficient.

DR. ANIGSTEIN (by Telephone): Well, the point of the MCNP X analysis is --

DR. ZIEMER: I know you want to find that out. I was just trying to get a feel how does photofission order of magnitude compare with a neutron-generated fission? Is it like six orders of magnitude less?

DR. ANIGSTEIN (by Telephone): I can't answer that.

DR. ZIEMER: Oh, okay. Well, we'll find out

I guess.

DR. ANIGSTEIN (by Telephone): I mean, certainly, you're not going to get a criticality.

DR. ZIEMER: Oh, no, no, no, I'm not even, no, I'm just --

DR. ANIGSTEIN (by Telephone): Neutrons you can get criticality.

DR. ZIEMER: No, no, I'm talking about the activation products or the fission products.

MR. CHEW: But what is the relative cross-sections.

DR. ZIEMER: That's why I'm sort of asking.

DR. ANIGSTEIN (by Telephone): I'm sorry. I didn't hear that last comment.

DR. ZIEMER: What are the cross-sections for photofission compared to the --

DR. ANIGSTEIN (by Telephone): I have them. I can't quote them. I don't have them at my fingertips. They're in the documentation for the MCNP X 2.6, and I have it in my computer, but I don't like looking things up while I'm on the phone because I get, I can't do two things at once.

MS. MUNN: John, do you feel like you have

the answer to your question?

DR. MAURO: Yes, the answer is, yes, we should continue down the pathway. And if for any reason anything other evolves in terms of new material comes in that changes the scope again, I will certainly let you know immediately.

MS. MUNN: Thank you.

DR. MAURO: But so far I feel comfortable that we can take care of this given the time and budget that we originally discussed.

MS. MUNN: We'll continue on the path that you have established.

REPORT ON STATUS OF SECOND MATRIX, RATINGS AND OF "CROSSWALK" TIB/PROC TABLE

And one last item as I mentioned earlier prior to our wrap up and a review of action items has to do with the Table 1 summary of first set of procedure reviews. You may recall that from long, long ago. Kathy Behling, are you still there?

MS. BEHLING (by Telephone): I'm still here.

MS. MUNN: Bless your heart. Thank you.

MS. BEHLING (by Telephone): I'll be brief. You should have received two tables from me somewhere around July 8th of 2007, and what I

was trying to do in response to the request from the previous work group on Table 1 is providing you. I went through the matrix, the first matrix for the first set of procedures that we reviewed, and I summarized all the documents that we reviewed, what revision they were and identified the total number of findings and then the total number of outstanding findings.

And let me just define outstanding findings. Those are findings that we had agreed upon that the resolution was for NIOSH to either revise their procedure or replace that procedure. I also included on that table what procedures have been revised by NIOSH and whether SC&A has reviewed those procedures.

And the bottom line of Table One is that there's still outstanding findings on five procedures that NIOSH has not, at least based on my current knowledge, has not revised so we're still dealing with the procedure we had reviewed initially. And there are three procedures that NIOSH has revised and SC&A has been given the authorization to review.

And those three procedures would be

OTIB-0008, OTIB-0010 and those have to do with overestimating procedures for film badges and TLD monitoring. They're not used as frequently I don't think anymore because we're dealing more with best estimate procedures. And then lastly, the procedure we have not reviewed is PROC-90 which actually -- and correct me if I'm wrong here -- but it replaces three of the interview-type procedures. I believe it replaces the scheduling telephone interviews, the performing of the telephone interviews and also receiving telephone interviews.

So those are the three procedures that NIOSH has issued revisions to that we have not looked at yet.

MS. MUNN: And so PROC-90 supposedly replaces four, five and 17, right?

MS. BEHLING (by Telephone): Four, five and 17.

Okay, and then Table 2 --

MS. MUNN: Well, before you go on though, Kathy, did you not say that there were, what number did you say had not been addressed yet? Before you said there were those three, you

said there were five that NIOSH had not yet addressed?

MS. BEHLING (by Telephone): Yes, and, Stu, maybe you can confirm this for me. I have listed that there's still outstanding findings from OCAS IG-002, that's our internal dose limitation guide, and I don't believe there's been a revision to that limitation guide. Also showing OCAS TIB-006, that there's been no revision to that. That's the interpretation of external dosimetry records at the Savannah River site.

Also I'm showing no additional revision on OCAS TIB-007, which is neutron exposures at the Savannah River site. OCAS TIB-008, which use of the ICRP-66 to calculate respiratory tract doses. I don't show a revision there. And finally, this is an ORAU OTIB-0001, which is Savannah River claims, no revision on that as far as I know.

MS. MUNN: Kathy, you got squeaked out by something just on that very last item. Would you repeat that?

MS. BEHLING (by Telephone): The last procedure that I don't believe there's been a

revision to is ORAU OTIB-0001, and the title is Maximum Internal Dose Estimates for Savannah River Site Claims. And that's the high five.

MR. HINNEFELD: I believe that's accurate, the accurate.

DR. WADE: Kathy, might I ask you to repeat again the three that have not yet been assigned?

MS. BEHLING (by Telephone): The three that have not been assigned are ORAUT OTIB-0008, and I'll give you the title. It's the Standard Complex-Wide Conversion Correction Factor for Overestimating External Doses Measured with TLDs.

The second procedure we have not been asked to look at is ORAUT OTIB-0010, which is the same title except it's film badge dosimetry. It's the Standard Complex-Wide Conversion Correction Factor for Overestimating External Doses Measured with Film Badge Dosimetry.

And then finally, is ORAUT-PROC-90 which replaces three of the interview procedures.

DR. WADE: Thank you very much.

MS. MUNN: I have one last question how you and Stu both with respect to the five that you gave us that you said no revision had come out yet by NIOSH. Are those all, with the exception of PROC-90, obviously. That's sort of taken care of itself. But are the others procedures which in your view were expected to have revisions?

MS. BEHLING (by Telephone): Well, based on a resolution that was stated during the original review of these documents, I believe that the resolution was that NIOSH would address the findings or the issues in a revision or a replacement document.

MS. MUNN: All of them do have a number of outstanding issues, outstanding findings I see.

So, NIOSH, are any of those in process right now, those five?

MR. HINNEFELD: Not, we can put them in progress pretty quickly, but, no, there's no real active work going on on them, but we can get started. We can give Tommy like three of them.

DR. NETON: He's coming back Tuesday.

MS. MUNN: Our earlier discussions were indicating how nice it would be to close this table and have it complete. If we can possibly do that without putting undue strain on your staff's schedule, it would certainly be helpful.

MR. HINNEFELD: We're used to putting undue strain on our staff.

DR. NETON: We wouldn't know how to work otherwise.

MS. MUNN: You've had a week of vacation. Now you're ready to jump back in.

Thank you, Kathy.

MS. BEHLING (by Telephone): Okay, do you want me to just briefly explain what's in Table 2?

MS. MUNN: Yes, please.

MS. BEHLING (by Telephone): What I did in Table 2 is for those procedures where there is a revision, and we have been asked to review the procedure, I've listed all of the outstanding findings and where we are in resolving those outstanding findings. Now as you'll see, the first item on Table 2 talks

about the external implementation guide, OCAS IG-001. And that I actually have reviewed in Supplement 3 of our Task Three. And has Supplement 3 been submitted at this point? I'm not sure.

DR. MAURO: Yes.

MS. BEHLING (by Telephone): Okay. What you'll see in that along with, if you go down through this table, I've identified where we have re-evaluated this, whether it's in Supplement 1, which you were looking at earlier today, or Supplement 3. And, in fact, if you go to your Supplement 1, Rev.1 that we were working with earlier and go to somewhere around page 105, you'll see that OTIB-0003 has three outstanding findings.

That OTIB was replaced with OTIB-0011, and when I looked at OTIB-0011, I included a table in there which becomes Table 1 and in our checklist becomes Table 2. And that Table 1 identifies each of these findings and whether or not we feel that they were properly addressed in the replacement document. And I did this as an example and hoping that the Board would agree with that approach. My

feeling is that I think to make it as easy as possible for the work group is if we are able to say, and in this particular case all the issues from the previous OTIB-0003 were addressed in OTIB-0011.

However, in some of the other procedures that I looked at such as OTIB-0004, I didn't feel that they had properly addressed all of the items. And in some cases you'll see a no, whether it's been resolved and a no or it's partially been resolved. And I would just suggest that for those items that are a no or partially resolved that they get incorporated into the matrix associated with either that, with our current matrix of Supplement 1 or Supplement 3 so they can be taken off of this original matrix. If that makes sense.

MS. MUNN: I think it makes sense. And the question that I have right off the bat is why we don't have under the Resolved column for OTIB-0003, why we don't say it's been replaced by OTIB-0011 and thereby eliminate that from this --

MS. BEHLING (by Telephone): Okay, if you go

to page five under the Table 2, under revision re-evaluated I did put OTIB-0011, and I identified it there. I should have made maybe a little bit more clear that this replaces the OTIB-0003.

The other thing that I did not do, I just ran out of time here, I didn't fill in the Resolved column for all of these which I am in a position to do that now. I just didn't go back to this.

MS. MUNN: Good. That seems like, now that you go over it again, I see what you've done. And if we had yes in the resolved column, I think that would probably --

MS. BEHLING (by Telephone): That would clarify it for you, and I realized today when I went back and I picked up this table that I meant to go back to this. I was working in the Supplement 1, and I got that out the door, and I never went back to this table, but I will. I will update this and send it out to everyone.

MS. MUNN: That would be helpful, and unless some other members of the working group object, her solutions for moving them off this

table is certainly okay with me. Is that fine with NIOSH and with work group members?

(no audible response)

MS. MUNN: Kathy, you have nodding heads here.

MS. BEHLING (by Telephone): Very good.

MS. MUNN: Your approach seems perfectly viable here.

MS. BEHLING (by Telephone): Okay, very good, thank you.

MS. MUNN: All we can do is keep pushing at this until we finally get this table closed out.

DR. WADE: Keep on keeping on.

MS. MUNN: Keep on keeping on. Thank you very much.

DR. ANIGSTEIN (by Telephone): This is Bob Anigstein. I do have an answer about the cross-section

MS. MUNN: Oh, do you?

DR. ANIGSTEIN (by Telephone): Yeah, it just took me a few minutes to find it. While Kathy was talking I was looking for it. For U-235 at about 14 meV you get a P cross-section of about 330 millibarns, if that means anything

to the person asking the question.

MR. CHEW: Sure.

MS. MUNN: Yeah, it does.

DR. MAKHIJANI: Probably non-negligible.

MS. MUNN: Non-negligible but pretty hard to get, I wouldn't want to

DR. ANIGSTEIN (by Telephone): I can't hear this.

DR. WADE: There's nothing substantive being said.

MS. MUNN: We're just saying pretty hard to get but not negligible.

MR. CHEW: Two thirty-five, isn't the material 238?

DR. ANIGSTEIN (by Telephone): Well, it's a mix. It's natural uranium.

MR. CHEW: Yeah, natural, I just --

DR. ANIGSTEIN (by Telephone): So natural uranium is about --

MR. CHEW: I've been looking it up on the site, too. It says an interesting result is the absence of any gamma to and cross-sections for U-238.

DR. ANIGSTEIN (by Telephone): The MCNP X code does have those cross-sections. I just

have to be looking at a published paper about this, and they just, they only have a few nuclides that they happened to show here.

DR. WADE: So you guys can take this up.

MS. MUNN: We appreciate your taking the time and effort to look it up.

And thank you, Mel, for your contribution. That's wonderful.

WRAPUP AND REVIEW OF ACTION ITEMS

Unless there are other really pressing items that anyone has right now, I propose that we continue with our wrap up and review of action items. From my perspective we've gone as far as we could go with Supplement 1 Table. Not nearly as far as I had hoped we would be able to go.

It's my expectation that we will pick that activity up exactly where we left it with hope that by that time, by the time we meet again NIOSH will have had an opportunity to respond to a significantly larger number of those items than are currently responded to. If anyone has any objection to that process, speak now or forever hold your peace. That's the way it's going to be unless you tell me

otherwise.

(no audible response)

MS. MUNN: With that being said, I would appreciate it, Lew, if you could wrap us up and read us the action items so that we all understand what is expected of us between now and our next meeting which --

DR. WADE: I have 14 action items, and I'll refer where I can to the page in Supplement 1 if you want to be able to ground yourself in the --

So starting on page six relative to finding OTIB-0020-03, there are two findings. The work group will ask the subcommittee to continue to keep the utility of this OTIB in mind as it reviews individual dose reconstructions.

Second finding, NIOSH will consider if more specific guidance within this OTIB would add value to the development of site-specific TIBs.

Finding three which relates to page 13, OTIB-0028 two and three, findings two and three, NIOSH is to provide SC&A with the output files from Keith Eckerman's analysis.

Finding four on page 14, OTIB 0019, which if you recall deals with the interpretation of regression data, NIOSH and SC&A will discuss, hopefully resolve and report to the work group on this issue. This is where the statisticians are going to have a stimulating discussion with each other.

On findings five and six, this relates to finding OTIB-0033-01 on page 15. NIOSH will review the title and contents of OTIB-0033 and modify as necessary.

Finding two relative to this issue, NIOSH will review OTIBs-0018 and 0033 to see if they are being consistently applied and appropriately used and then report that to the work group.

Finding number seven relates to OTIB-0004, and that’s on pages 15 through 17. NIOSH will complete OTIB-0053 and then the work group will ask SC&A to review OTIB-0053.

Finding number two, NIOSH will confirm that the OTIB deals only with uranium metal facilities and excludes chemical processing of uranium.

Then we move to some findings that

relate to the global issues. On global issue related to the internal dose from fission products, the work group will recommend to the Board that OTIB-0054 be reviewed by SC&A during next fiscal year. And they'll make that recommendation to the Board during the September 4th call.

Relative to the global issue on ingestion, NIOSH will report at/or before the January 8th Board meeting on the status of their work towards resolution of that global issue.

Concerning the PERs, NIOSH will provide to the work group a list of completed and in progress PERs, and this will take place before the next work group meeting.

With regard to this issue of following up findings to closure, NIOSH will move to complete revisions to the following five documents: OCAS IG-002, OCAS TIB-006, OCAS TIB-007, OCAS TIB-008 and ORAUT OTIB-0001.

Next to last action item, SC&A will update its Table 2 to show a more definitively the status of the completed items

And then lastly the work group will

continue to work on the issues in Supplement 1 when next it meets.

And I think that's all the findings that I've captured.

MS. MUNN: Those agree with mine although mine are considerably less articulate than that. It would be --

DR. WADE: They pay me the big bucks for something.

MS. MUNN: I know, and thank goodness.

It would be helpful for me if you would send me your list electronically so that I can compare it with mine. And there were one or two items that I had worded slightly differently. I'll communicate with you on those.

Is anyone else aware of action items that were not covered?

(no audible response)

MS. MUNN: Are we all aware of our next meetings, when we're going to be where we're going to be?

DR. WADE: It couldn't hurt to remind folks. I think the plan is that on October the 2nd, which is the Tuesday of the week that contains

the next face-to-face Board meeting, this work group will meet at a time to be, I think 10:00 a.m. we're looking at.

MS. MUNN: Yes.

DR. WADE: Ten a.m. central daylight time.

MS. MUNN: Ten a.m. central, yeah. And we will, unless we have unusual expectations during the month of September, this work group will not have any formal calls or meetings. It's my expectation that we probably will have some kind of formal meeting between the October meeting and the January meeting since we have a considerable body of materials here. And it's clear that we can't handle it in a single day's session.

So we'll probably try to complete the material that we did not cover sometime after the October meeting. Hopefully, before we get too far into December, more than likely after Thanksgiving but before Christmas at a time to be announced.

Is there anything else for the good of the order?

DR. WADE: I think this probably ranks in the top five most productive work group

meetings. I think everyone did a fine job in terms of preparation and execution, and you're to be complimented.

MS. MUNN: Thank you all. We will see you in Chicago, Naperville to be precise.

(Whereupon, the work group meeting was adjourned at 4:45 p.m.)

CERTIFICATE OF COURT REPORTER

STATE OF GEORGIA

COUNTY OF FULTON

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the day of Aug. 29, 2007; and it is a true and accurate transcript of the testimony captioned herein.

I further certify that I am neither kin nor counsel to any of the parties herein, nor have any interest in the cause named herein.

WITNESS my hand and official seal this the 14th day of Oct., 2007.

_____

STEVEN RAY GREEN, CCR

CERTIFIED MERIT COURT REPORTER

CERTIFICATE NUMBER: A-2102