UNITED STATES OF AMERICA
DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

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NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
ADVISORY BOARD ON RADIATION AND WORKER HEALTH

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WORK GROUP ON THE PINELLAS PLANT SEC

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THURSDAY, JUNE 11, 2009

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The meeting came to order at 9:30 a.m. in the Zurich Room of the Cincinnati Airport Marriott Hotel, Hebron, Kentucky, Phillip Schofield, Chairman, presiding.

PRESENT:

PHILLIP SCHOFIELD, Chairman
BRADLEY P. CLAWSON, Member*
ROBERT W. PRESLEY, Member*

THEODORE M. KATZ, Acting Designated Federal Official

IDENTIFIED PARTICIPANTS:

NANCY ADAMS, NIOSH Contractor*
SHAHRA ANDERSON, Senator Bill Nelson's Office
JASON BROEHM, CDC
GRADY CALHOUN, NIOSH
PETER DARNELL, NIOSH
LARRY ELLIOTT, NIOSH
BRIAN GLECKLER, Dade Moeller & Associates
DONNA HAND, Public
EMILY HOWELL, HHS*
JOHN MAURO, SC&A
MICHAEL RAFKY, HHS*
ELYSE THOMAS, ORAU

*Participating via telephone

T-A-B-L-E O-F C-O-N-T-E-N-T-S

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

9:31 a.m.

MR. KATZ: Good morning, everyone in the room and on the phone. This is Ted Katz. I'm the acting designated federal official for the Advisory Board on Radiation Worker Health. And we are convening the Pinellas Working Group.

And as always, we begin with roll call, beginning with board members in the room with the chair.

CHAIRMAN SCHOFIELD: Phillip Schofield, Chair, board member, no conflict.

MR. KATZ: And thank you. Yes, please, everybody address conflict as well.

And then on the line, board members?

MEMBER CLAWSON: Brad Clawson, board member, no conflict.

MEMBER PRESLEY: Robert Presley, board member, no conflict.

MR. KATZ: Okay. And, Dr. Poston,

are you with us?

Okay. And any chance, Mike Gibson, are you with us?

Okay. Then NIOSH ORAU Team in the room?

MR. CALHOUN: Grady Calhoun, NIOSH OCAS, no conflict.

MR. DARNELL: Peter Darnell, NIOSH OCAS, no conflict or bias.

MR. GLECKLER: Brian Gleckler, Dade Moeller & Associates in support of NIOSH, no conflict or bias.

MS. THOMAS: Elyse Thomas, ORAU Team.

MR. KATZ: And then on the phone for NIOSH ORAU Team?

You expecting anyone on the phone? Okay.

Okay. And then SC&A in the room?

DR. MAURO: John Mauro, SC&A, no conflict.

MR. KATZ: And on the line. Any

SC&A staff on the line?

Okay. And then other federal employees or contractors on the line?

MS. ANDERSON: Shahra Anderson, Senator Bill Nelson's office.

MR. KATZ: Could you repeat your first name, please?

MS. ANDERSON: It's Shahra Anderson.

MR. KATZ: Oh, Shahra? Thank you. Welcome.

MS. ANDERSON: Thank you.

MS. ADAMS: Nancy Adams, NIOSH contractor.

MS. HOWELL: Emily Howell, HHS.

MR. RAFKY: Michael Rafky, HHS.

MR. BROEHM: Jason Broehm, CDC.

MR. KATZ: Welcome, all of you.

Okay. And then members of the public in the room?

MS. HAND: Donna Hand.

MR. KATZ: So Donna Hand's here.

Welcome, Donna.

And on the line, other members of the public?

If you want, you can identify yourself. You don't have to.

PARTICIPANT: That's okay. My name is not important.

MR. KATZ: Okay. Very good. Welcome anyway. And then just to let everybody know on the telephone, the usual procedure is to mute your phone except when you are addressing the group. And if you don't have a mute button on your phone, star six on your phone will work as a mute, or it usually does. And then if you mute yourself using star six and you want to address the group, to come off of mute you just press star six again.

And also please remember, folks on the phone, do not use your hold button at any time during the call. If you need to leave the call for a bit, just disconnect and call

back in, because your hold button usually is associated with some sort of noise or feedback that interrupts the discussion. So thank you.

And, Phil, it's all yours.

CHAIRMAN SCHOFIELD: Okay. The way we're going to do this, we're just going right down the issues as they're outlined in the matrix. And I don't think it's really going to take us all that long today. I think mostly it should be fairly well in hand.

So the first issue is on the reconstruction doses in absence of early health physics industrial hygiene environmental records.

You want to do it?

MR. KATZ: John, you want to just sort of get --

DR. MAURO: Yes, maybe I can set the table a little bit.

CHAIRMAN SCHOFIELD: Okay.

DR. MAURO: That would be helpful.

The last time we met I guess was

on June 11th, about a year ago, and a lot has been accomplished at that time and since that time.

The best way to think about this is, you know, Pinellas issued its -- ORAU issued its site profile in 2005. I think there might have been a 2006. One of the TBDs might have been as recent as 2006.

SC&A issued its review of the site profile dated September 16, 2006 and the bottom line is there were 11 primary issues, eight secondary issues. The primary issues are by far the ones that are of concern.

There was a work group meeting held on June 11th. Numerous follow-up investigations and white papers have been exchanged. And on June 9th, last week, SC&A issued a PA-cleared version of the complete matrix, which is a beast. It's big. The reason it's big, it's almost like a compendium of the history of the program. So we captured every step along the way. So it's somewhat

burdensome and it's certainly not something we're going to want to go through in detail. It's unnecessary. But it does represent a convenient record.

MR. CALHOUN: Is that the 50-page one?

DR. MAURO: Yes, the front of it is dated June 1st, 2009. It's probably about 50 pages, yes. That's it right there. Okay?

Now, what I would recommend we do, it turns out that out of the 11 findings, for all intents and purposes, nothing new has developed. And therefore, all intents and purposes, SC&A's position is recommend closure on eight out of the eleven. And really it's a matter of the best way to look at it is we agree in principle with the solution and at such time that the site profile is revised, the degree to which those issues have been attended to, and of course it will be up to the work group whether they want to give it one last read, sign off, or sign off on it

now.

Because they're relatively brief, one of the things I did that might be helpful to go through all 11, it might be a good idea to sort of march through, a refresher, is we had a conference call with Senator Nelson's office a week ago?

CHAIRMAN SCHOFIELD: Yes, somewhere around there.

DR. MAURO: Last week, yes. And what I did at the time, this was only distributed to the work group, not to Senator Nelson's offices. I took these 50 pages and I boiled it down to two, and I just handed them out to you.

And, Ms. Hand, do you have a copy of that?

MR. KATZ: Yes.

CHAIRMAN SCHOFIELD: And I think what might be a good idea is, we could go into each one quickly, go through it, see where it is and the degree to which we want to dive

deeper into it, revisit it, discuss it further. We certainly can. But it's certainly a good way rather than burden ourselves with the 50-so pages here.

So if that's okay with everyone, I could start marching down.

One point that Grady and I believe, Peter, you had mentioned, we will be getting to metal tritides, item No. 2. And I understand there are certain ground rules that we have to follow. And I'm looking, I guess to the Q-cleared people in the room who have participated in that ground rule meeting, sort of make sure we stay within boundaries.

MR. DARNELL: We can talk about the material, what was used, but we can't talk about quantities or how it was used.

DR. MAURO: Fine.

CHAIRMAN SCHOFIELD: Or types of specific quantities --

MR. DARNELL: Yes.

DR. MAURO: And that is going to

be --

CHAIRMAN SCHOFIELD: So, in kind of general terms, we have to say in general terms as far as --

MR. DARNELL: But I actually have a very general statement to make about it that I think will suffice.

DR. MAURO: Well, okay. Well, I'm going to get there quickly.

Issue one was something that was resolved quite some time ago. It basically said that when we reviewed the site profile we felt that there may have been a lot of additional records out there in different record centers that could enrich the site profile. And we passed that comment on and we actually looked into some of those records, but you folks did a superb job in going to LANL, Kansas City, Savannah River, Lawrence Livermore, Sandia, and you pulled 604 new files. Loaded them up on the O: drive. We had a chance to look at it. As far as I'm

concerned, you know, we have a very comprehensive site query database. The information there of course is all valuable. And I think you have been totally responsive to that particular concern.

Now what might occur, and this is sort of one of those areas that whether you want to consider them open or closed, I think you were responsive to that issue, the degree to which your next version of the site profile might reflect changes that reflect that 604 files. That's something that, you know, the extent to which you may want to see what happens, we'll deal with it at that time. But right now, as far as I'm concerned, that concern has been resolved.

MR. DARNELL: Most of the documentation that we received in the 604 files is redundant to what we already have. And this is just as a first gloss over. We haven't gone in depth yet. But we did note that there was some data for the D&D period in

there.

DR. MAURO: Oh, good.

MR. DARNELL: That will definitely go to another issue, but it is something that will be added to the TBD over the course of time when it gets updated.

DR. MAURO: Perfect. The second item is, the issue is potential doses from insoluble metal tritides not sufficiently addressed. That goes way back. That was one of our original findings and there's a long story here. This is probably the single most important issue, from my perspective, and I think SC&A's perspective for the following reason: Tritium is the major compound that was dealt with or isotope that was dealt with at Pinellas for a variety of reasons. At the time we reviewed the site profile, there really was no provision, this goes back a few years, for reconstructing doses to people who might have been exposed to either organically-bound tritium or the various metal tritides.

And the reason that's an issue, and I guess this is as much for the visitors as it is for the people on the line, the reason for the issue is most facilities that hand tritium deal with tritiated water and there's always, and for the longest period of time there's been comprehensive bioassay samples where you pull a urine sample, you analyze for tritium and you could reconstruct the intake of tritium from that.

Tritides becomes a little bit different because what you're inhaling is not tritiated water anymore. It's some type of metal where the tritium is bound to various degrees. And as a result, it's more like a particle now. So when it's inhaled it has different biokinetics. It resides in the lung quite a bit longer, depending on the nature of the tritide. And as a result, it has the potential to for the same amount inhaled in terms of let's say picocuries. The dose to the lung could be substantially larger. And

even confounding it worse is that because it's retained so well, if you take a urine sample, you may not see anything, but there may have been a substantial intake. So it creates a health physics dose reconstruction challenge.

NIOSH did a superb job in issuing OTIB-66. OTIB-66 is a generic complex-wide protocol for reconstructing doses to workers who might have been exposed to organically-bound tritium or to various forms of tritides, metal tritides. We reviewed that in depth. We had the best there is, as far as I'm concerned, Joyce Lipsztein, look at it and she's intimately familiar with ICRP protocols for that. And she basically, with some minor commentary on organically-bound tritium, which is subsequently repaired and fixed, which really is only a very marginal issue that has been taken care of -- we find that, per OTIB, technically sound, scientifically valid and a good rock to build your work on.

Now, however, that brings us to

the issue at hand, how do you apply it? Great. If I know you were working with tritides for a five-year period at some facility and I took monthly urine samples, and I measured it, I could reconstruct your dose using OTIB-66. The problem becomes do we know what you were working with, what form of tritide, when you were working with it, so that we could implement it at your site? And that has become a challenge because the quantify of tritium that moves through any given facility -- many facilities that use tritium and tritides, it's hard to discern who was working with it, how much they were working with. And not only is it hard to discern, this subject is -- we're moving into the world of classified information. That's my understanding. By the way, I don't have a Q clearance, so what I'm describing is something I know from the general understanding of the subject.

Now, on May 27th, a special

meeting was held of the Mound work group where this was the first time this issue entered the pipeline and to be dealt with in a serious manner. And the strategy that discussed and is being implemented as speak is the work group, NIOSH, the SC&A crew. Basically the strategy is, NIOSH feels they're in a position to identify those workers who might have handled the most recalcitrant, I'll use that word -- the form of tritide that is the most insoluble, and those that dealt with lesser soluble versions. So the idea being is if you could sort of perform a triage. Which workers we're going to assume are being exposed to this stuff and which ones we assume are exposed to some other form. And the bottom line is they identified 12 workers that they said we're going to assume those 12 workers, and I'm believe I'm free to say this, because I got the information, is at hafnium tritide. Hafnium tritide is the form of tritium that is the most insoluble. And if you assume that,

you're making the most conservative assumption. So that if you have bioassay data from the worker, you're going to say I'm going to assume that bioassay data is the result of inhaling hafnium tritide. You are assigning the highest possible dose that that person's respiratory tract could have experienced.

Now, if the dose is something other than the respiratory tract, you always assume it's tritiated water, because that gives you the highest dose to organs other than the respiratory tract.

That strategy was, and as for Mound, was found to be during the work group meeting, reasonable. SC&A found it to be reasonable and appropriate. I believe the other members of the work group found it appropriate. So the idea being each site will be dealt with from that perspective.

Now, my understanding is when we discussed this matter in our conference call with the representatives from Senator Nelson's

office is as it turns out there were no forms of tritium that were handled at Pinellas that would fall into the category of the most recalcitrant form or insoluble form like a hafnium. And on that basis I'm not quite sure what you're doing and I think that you're still deciding what you're going to do, but in my opinion it's tractable. That is, you will come up with we're going to assume everyone --

MR. DARNELL: Well let me say I can tell you --

DR. MAURO: I'm sorry. I'm talking too much.

MR. DARNELL: -- what we're probably going to do. Mostly likely, and this research is still being done, so I may have to back off a little bit from the conference call, there was no hafnium-type tritide there. But the three that are listed in the research database are class M, so it's a little bit less recalcitrant for the workforce. But Pinellas was different from Mound in the case

that the tritide contamination from the neutron tubes was a bit more spread out. In other words, more of the workforce could be exposed to it.

Most likely we will be going to the path that anybody that had tritium exposure would be calculated for exposure to tritides. We just don't know which one of the tritides yet we will be using as the worst actor.

DR. MAURO: Now, I've been thinking about this since the May 27 meeting and saying, okay, I think to a certain degree this does bring us into what I call the world of classified concerns.

MR. DARNELL: Right.

DR. MAURO: That is, at some point in the process someone has to sit down and say what you just said is reasonable and how you're going to implement it seems to be reasonable because you have information that says just what you said. We know that there

were no hafnium-like and this other form. The M form does in fact capture the clearance in the biokinetics for just about all of the possible -- and I understand there are a lot of different forms. There may have been dozens of different possible forms. And that the M version that's modeled in OTIB-66 is reasonably bounding for all those various forms. Someone needs to be able to say that and I think it has to be said behind a cone of silence.

MR. DARNELL: There are two, or actually three cleared personnel that are working on this issue for OCAS.

MR. KATZ: Generally you don't name who is cleared, but --

DR. MAURO: That's okay. Well, I have to say, that's the extent of my understanding and my -- SC&A's, when I say my -- SC&A's perspective on this is this issue is well in hand. It's moving in a direction that seems to be tractable. It's in a direction

that is compatible and consistent what's being on other sites. And in general, I think there is a favorable outlook that this is going to be resolved.

CHAIRMAN SCHOFIELD: This issue will be addressed in the latter part of this month in Germantown.

DR. MAURO: Okay.

MR. KATZ: So just to clarify that, in Germantown there's going to be a meeting to sort of verify information related to Mound. And you're saying that you will also take care of Pinellas at the same time?

CHAIRMAN SCHOFIELD: Yes, the same classification problem would be dealt with at that time.

MR. KATZ: Thanks.

CHAIRMAN SCHOFIELD: And there will be a more generic terminology coming out of it.

MR. KATZ: Thanks.

DR. MAURO: And that was one of

the three out of the eleven that was what I consider to be still in the hopper. But as I said, it sounds like it's moving along.

The third item has to do with plutonium-238, plutonium-239, bioassays. And in our original review, we had a number of comments, and we actually issued a white paper that said we're having trouble with your minimum detectable concentrations for plutonium. A lot of variability. We saw some problems.

However, since then, and this is a relatively recent development, you folks have issued a white paper and we've discussed this matter during the previous meeting, and it might be a good idea to give the summary of what the latest position is on that matter.

MR. DARNELL: Basically, NIOSH and our contractors went through the bioassay data itself person-by-person for the Pinellas site that had plutonium bioassay. Most of the bioassay dealt with pre-employment samples.

In other words, sampling that's done before you start working with plutonium. There were a couple that had bioassay samples after they started working with the program, none of which were positive. I'm trying to keep up with what I'm reading.

Because there was no real need for a bioassay program at Pinellas, they didn't follow up with those workers. They didn't keep on doing a bioassay program. The downside of that was that they actually didn't do the bioassay to the level of expectation that we have in today's world with the bioassay. So the quality of the bioassay data that Pinellas presented was kind of questionable, limited amount. Some of the things didn't jibe with how the rules and regulations are set up now. And NIOSH basically agrees with SC&A that the quality of bioassay data is questionable in that it's limited.

But in looking at the program and

looking at what plutonium is used for at Pinellas, it was for radio thermoelectric generators, I think it's called. RTGs. And they were batteries, triple encapsulated. Which means plutonium was inside three different encapsulates. There was no record of any gross contamination. Phil has provided us with the information that they didn't send out contaminated RTGs in general in the DOE complex. We have some indication that a very, very lower level of contaminants found on a battery here and a battery there. Those were decontaminated inside the fume hoods at the facility.

Brian has provided some calculations, if we need to see them, to tell how many -- at the contaminations levels discovered how many sources would have to be handled at that contamination level to get to 1 millirem, and was on the order or 11,000.

MR. CALHOUN: That's per day?

MR. DARNELL: Per day. So there

really is from a health physics perspective, no loose contamination exposure for plutonium at Pinellas. So what we proposed to do in our white paper is in the event that there is at some future time a claim that the documented plutonium contamination; in other words, whoever handled it, we would perform dose calculations for that worker at that time.

What we're basically going to do is use the best MDA available. Either if it's Pinellas data and it works out to be good, we'll use that. If not, we may use another programs MDA to calculate those.

DR. MAURO: If you're confronted with that circumstance?

MR. DARNELL: If we're confronted with that circumstance.

It would be episodic in nature. It's not going to be a chronic dose. The basic changes to the TBD that's going to come out of this is the plutonium section will probably disappear to be replaced with this

description of how we're actually going to handle the plutonium.

DR. MAURO: SC&A's position is that is satisfactory to us and we certainly wait to see the revised section. But in principle, like I said before, it sounds like the problem has gone away.

CHAIRMAN SCHOFIELD: Correct me if I'm wrong here, but I do believe in one of the documents they said any that were -- I don't remember the numbers now, were certain DP and were returned to the supplier.

MR. DARNELL: That never actually happened at Pinellas.

CHAIRMAN SCHOFIELD: Right.

MR. DARNELL: There was a --

CHAIRMAN SCHOFIELD: But that was part of their procedure, that anything at that level --

MR. DARNELL: Yes.

CHAIRMAN SCHOFIELD: The procedure, the SOP required that that be

returned to a vendor.

MR. GLECKLER: But they did find some that were below that value. And what they would do is -- that was upon the receiving inspection, so they would perform the receiving inspection in a hood, you know, to survey them for contamination. And if they found contamination, if it's below the 200 D per M, they would decon it before they released it to the plant and then it was handled within glove boxes by the workers after that.

CHAIRMAN SCHOFIELD: Yes, that is standard protocol everywhere for the RTGs.

DR. MAURO: If we're ready to move on, No. 4. No. 4 is an old one that has been since -- you know, it's not one of the active ones, one of the three that I mentioned.

The issue on No. 4 was when we reviewed the records, the film badge records of the workers, we found that in the early years there was only a relatively small

fraction of workers that were badged. Now that in itself is not necessarily a problem as long as it was done within an overarching health physics program where you pick those workers to be badged for good reason and let other workers out for good reason, as opposed to what we call sort of random sampling of people where, you know, sometimes we call it cohort sampling.

We've had this problem in the past where NIOSH's position was, well, the people who were badged, they were badged because they're the ones that have a potential for greater than 25 percent of the radiation protection standards, and everyone else didn't. And we would say no, no, no. We looked into the literature. This is not here though. But whereupon the -- no, the way in which they were sampling is they did that, but there was some concern that they would just pick -- well, we could take a carpenter, an electrician, a guy who worked in this

building. In other words, almost like cohorts so that we had representatives of different groups captured in the sampling program. And each person sort of was dealt with as if you were representative of that work group or that time period.

And that sort of creates a little bit of a difficulty because it means that were the people that were sampled -- not sampled, were the people that were monitored in those days truly representative of those workers are at the highest potential for exposure? And that's the reason we have raised this issue here and why we have raised the issue in the past elsewhere.

However, in this case, you folks responded back with a considerable amount of documentation in the records that demonstrate to our satisfaction that, no, this was not cohort sampling. This was very much by design, under deliberate control of the health physics community at the time, that the people

that were monitored were in fact the ones that had the potential for exposure and it was not cohort sampling or badging. So my understanding is that this type of explanation is going to be provided or has been provided, or will be provided in the next version of TBD.

MR. DARNELL: The next version.

DR. MAURO: But in principle we are convinced that this issue has been resolved.

No. 5.

MEMBER CLAWSON: Hey, John. This is Brad.

DR. MAURO: Yes?

MEMBER CLAWSON: I've got a question for you.

DR. MAURO: Sure.

MEMBER CLAWSON: You were just saying that as soon as this new TBD comes out and everything else like that. So have we actually laid hands on this information and

reviewed it?

DR. MAURO: Yes, and only in terms of material that was provided to us in response to these issues. That is, we've received white papers. We have material that we incorporated into the big matrix that we're not working from. We have a very large matrix.

When we opened up this discussion, I made reference that I'm working from a very abbreviated matrix. But we do have a very large matrix that's --

MEMBER CLAWSON: Right, which I'm looking at and stuff like that. I just wanted to make sure, because it sounded like to me, and this may have been my misconception, that you were satisfied with it, but we really hadn't seen it yet.

DR. MAURO: No, we actually have the quotes. In other words, in the matrix itself for this particular issue, there's quite a bit of discussion with quotes from the

original records that go way back, Pinellas, that says that yes, this was not cohort sampling. This was deliberate selection of workers who clearly had a potential for exposure above some level. I forget whether it's 25 percent or 10 percent.

MEMBER CLAWSON: Twenty-five percent. Any indication persons who had a potential of 25 percent. 20.10(1) Code of Federal Regulations.

DR. MAURO: Yes. Right. And given that I guess objective of the design of the sampling program, what this tells me is that means that the workers that -- that doesn't mean there aren't other workers. Understand. That doesn't mean there aren't other workers who might have experienced elevated exposures, but they were not part of the badging program. What it does mean is if the badging program was designed to accomplish that and it was done in a deliberative way, that means the population of data that you

have represents the workers that are the high-end workers. And from there you could construct a distribution of exposures that could be used for a coworker model. And then at that point, you could assign whatever the judgment is made. I mean, here's where we come in. Okay. Now I'm about to reconstruct the dose to the worker who wasn't badged back in, whatever date it is. You're going to have to assign a dose.

Now as along as you have a distribution of data, of real data, that you feel bounds the upper end of the distribution, then it becomes a judgment of the dose reconstructor to select whether you want to work for that particular worker that was unbadged, whether you feel it's appropriate to assign the full distribution, the upward 95th percentile, or some percentile in accordance with OTIB-60, I think it is.

So the wherewithal exists. That's what I'm getting at. The wherewithal exists.

The data exists. That will allow NIOSH to build a coworker model, assign doses to those workers, those 75 percent of the workers that were -- you know, whatever the percentage was, that wasn't badged and is a way to assign doses to them that are scientifically sound and claimant favorable.

We have had problems in the past where the data set upon which the coworker model was based was in question that doesn't really capture the high end. For example, we have claims made at other sites where the film badges were left behind. And the reasons being, because as they approached the high end exposures, they were directed to leave film badges behind. This is something that came up about a test site.

Now what that does is that undermines the integrity of your distribution for your -- you don't know if you caught the upper end of the tail. A tremendous amount of work went into that; I don't want to go into

it, on Nevada Test Site, but I bring it up only because it's when the distribution of data that you have is in question in terms of being able to capture the upper end of the distribution is when you run into trouble. We do not see that here.

MEMBER CLAWSON: Okay. So do we have coworker model for this yet?

MR. GLECKLER: Yes, it's actually in the TBD already we used for the un-monitored workers. We have a 95th percentile dose of 100 millirem that we assigned.

MEMBER CLAWSON: Okay. Well, one of the reasons why, and this pertains to Pinellas, is because one of our dose reconstructions that we did we went into the -- one of them was a Pinellas worker, was a receiving clerk. And they didn't really have all this information. And they deemed because of her job that she wouldn't have received this. But I just want to make sure we got a model that we can work with, because actually

she's the one that received and shipped all these RTGs and everything that came into the plant and so forth. So I just wanted to make sure that we've got a good coworker model to be able to look at.

MR. DARNELL: Yes, we have evidence from the workforce that these RTGs were handled by hand. There was no special precautions taken. No gloves were worn between the worker's hand and picking up an RTG source, which tells us that the RTG sources themselves were extremely small. They generate a lot of heat as they get larger. So knowing that, we know that the exposure potential is extremely small for these.

MEMBER CLAWSON: Okay.

DR. MAURO: Yes, Brad, I think you bring up a question that's in my mind very important. That is, though the machinery exists in the site profile for reconstructing doses, when you actually -- and let's say we find favorably that, yes, basically they've

got a sound approach, what you're saying is now we have a real case where it's implemented, and it may not always be implemented correctly. Now the way SC&A catches that is, you know, we've been reviewing one to two-and-a-half percent of the cases. And we do find cases where the actual implementation of the guidelines, the OTIBs, the site profiles do not follow, you know, are not being followed. And that would be a finding, and that's dealt with.

So, you know, it's a real concern because, you know, there could be cases, other cases, that we're not reviewing where perhaps there has been -- the implementation of the protocols have not been right on target. But at least, you know, we're sampling a portion of it to see the degree to which that occurs.

MEMBER CLAWSON: Well, right. And what we saw in this dose reconstruction was the reconstructor said due to her duties as a quality assurance manager and shipping and

receiving clerk she would not have received -- been around any of these doses or anything else, which I highly disagreed with.

MS. HOWELL: Brad, if I could just interrupt you for a minute. I think we're getting a little too specific about individual claimants here. We need to be a little bit more broad in our conversation.

MEMBER CLAWSON: Okay. That could cover a whole lot of people. But how about a Pinellas worker that received -- well, Emily, you tell me how you'd want me to explain her.

MS. HOWELL: Well, I'm just not sure that we need to go into, you know, specific details about individual cases in order to address the concerns that you are having. But I'm not sure, you know, how to --

MEMBER CLAWSON: I'm looking to you for direction, because part of the problem is it was said because of these positions that she would not have received this, which was totally wrong.

MR. DARNELL: Okay. This is Pete Darnell with OCAS. Next week, if you will call me through the OCAS 800 line, I'll be glad to discuss any claim in detail with you.

MEMBER CLAWSON: Well, no, this was done through the -- I have no problem with that. But the issue that we got into was how this model was going to actually work, because we've already seen signs of it that people were cut out of this because they felt that their job tasks would not have been around some of this stuff, which was wrong. And so that was the point that I was trying to get to, is that I want to make sure as we're singling out these people and looking at it we really have a clear understanding of what their job tasks were.

MR. GLECKLER: One thing I can provide is a little bit of background. People assigned to the RTG facility were required to be monitored. So if they were ones receiving the RTG sources, they would have been assigned

to that facility. They would have been required to be monitored and dosimeters would have been assigned. So un-monitored doses would not be an issue for those workers.

MEMBER CLAWSON: Okay. Well, all I'm telling you is what we've seen so far. But we're working that on the other end of the dose reconstruction, because it was a finding and we'll just go on from there. But I just want to make that we keep that in the back of our mind.

DR. MAURO: Brad, this is John. I'm going to go out on a limb a little bit here, because I've raised this issue before, but not in this context. You know, when we do our Task 4 dose reconstructions, we look at some sampling. And that's a relatively small fraction of the total DRs. We are now moving into a realm where we're looking at more and more of what we're calling the best estimates. And I've made an observation, and I mentioned this at the last dose reconstruction

subcommittee meeting. It seems to me that when a dose reconstruction is performed and it's a best estimate, and it falls in the area of 45 to 50 percent POC, that's where the action is. Usually if it's up -- a bounding or minimizing, or bounding or upper end value, which is either denied or -- we have reviewed so many of those and, you know, though we may find some disparities in whether or not they follow their procedures exactly, it doesn't make a different. It happened in one case with OTIB-4.

But by and large, you know, when a maximizing or minimizing approach is used, or when the dose reconstruction is realistic and it comes in very low, well below -- I'll say below 40 percent or 45, it turns out that any errors that were made really don't create a circumstance, in my opinion, where the potential for reversal exists.

I made a recommendation, and I'm going to do it again, if the designated

federal official and project office doesn't mind, I think that there aren't that many best estimates that fall within 45 to 50 percent. There aren't that many best estimates as it is, never mind between 45 and 50 percent. It would be a good idea to review them all, because those are the places where if there have been errors made that are of some significance that's where the reverses could occur. And that's a pitch I've been making, but I'd like to make it again.

MR. KATZ: Well, let me just speak to that, for a minute, point of view. The process here is that, I mean, that is in the domain of the dose reconstruction work subcommittee and it's absolutely valid for you to raise it and make a pitch for that. I think that was discussed to some extent in the last subcommittee meeting.

DR. MAURO: And set aside.

MR. KATZ: And set aside. But that is the place to come to resolution about

how to go forward.

MR. DARNELL: One point I'd like to just make sure everything's correct. The band is between 45 and 52 percent that a best estimate is found. It's not 45 and 50.

MR. KATZ: Okay.

DR. MAURO: Well, once it's compensated, well, certainly that could be looked at. But see, my main concern is I am catching now, I review all the AWE dose reconstruction, and I've been seeing 49.6, 49.2 and I'm reverse -- and as far as I'm concerned, I found enough underestimate that could be a reversal. I'm saying, may goodness, this is important. And of course you haven't seen it yet, but this is the last round.

Now, I think that when -- this is quick and we'll move on, but when we met with the dose reconstruction subcommittee and we discussed this possibility, I think there was the belief that there were an awful lot of

those, and I think there weren't. And I did not have the presence of mind at the time of the meeting to pose the question, well, how many are there? Right now there are 25,000 adjudicated dose reconstructions. Out of that how many have been denied, are best estimates and fall within the band of 45 to 50 percent? I think that's something we could find out. And if it turns out it's a handful, I think we'd be doing a great service by reviewing them all. Okay. See, that part of the story I didn't say during the BRE.

MR. KATZ: That sounds perfectly reasonable to me.

DR. MAURO: Yes. Okay.

MR. KATZ: It's Mark Griffon and subcommittee.

DR. MAURO: Well, no, I think they were under the impression that there were thousands of them that were in --

MEMBER CLAWSON: John, at that time, and we're a little bit off, we need to

get back to where we're at with Pinellas, but --

DR. MAURO: Okay.

MR. ELLIOTT: Brad, this is Larry Elliott. If I could speak here, each board presentation that I give on the status of the program, there's one slide that is a bar graph that contains the breakdown of probability of causation on the claims that have been completed, as we understand them, and there's a bar of 40 to 49 percent, I believe. But we can provide the 45 to 49.9. And it's not thousands. It's on the order of hundreds, perhaps; I don't know the exact number, but we can get that for you.

DR. MAURO: We see 40 to 44.9 that are maximizing. And though they're maximizing, they still fall below. We don't think those need to be looked at. We are more interested in the ones that are best estimates. So that's a further parsing down, which could really minimize the number. Okay?

MR. ELLIOTT: Well, there shouldn't be any maximizing in the 45 to 49 percent category. Those should be best estimates and those are run also, as you know, through IREP a number of times. We don't just run them through once. There's a statistical procedure to assure that we're getting some precision in that probability estimate.

But yes, we can provide, identify what you're asking for.

DR. MAURO: Thank you, Larry. And I have to say, I know I just stepped over my bounds a little bit, but I took advantage of this opportunity given the question that was raised by Brad.

MEMBER CLAWSON: Right. And we'll take that up in the dose reconstruction.

DR. MAURO: Thank you.

MR. ELLIOTT: Thank you.

DR. MAURO: No. 5. We're halfway through. Problems with personnel dosimetry. Very general term. When we originally

reviewed the site profile, we noticed that there -- going back to the early years, the design and the make of the film badge that was used was not clear in our mind. And as a result we were not really sure of what the lowest low limit of detection would be for that particular design, how it was calibrated. I guess my understanding is that -- so we were wondering how you're going to deal with a film badge that we don't have a good understanding of what the lower limit of detection should be.

Subsequent to that, you folks have provided a response and you plan to include that material in the TBD, which goes into considerable detail on the design, calibration and lower limit of detection for that vintage film badge. And, you know, we are looking forward to seeing that. But in principle, it sounded like -- and the material you provided sounds like that you have this well in hand. So, you know, when that material is provided

or the TBD is updated, I think that this is something you'll be -- I believe that, you know, you would be able to get your hands on information like that and come to grips with this matter. And, push comes to shove, if there's some uncertainty, there's no doubt you could place a claimant-favorable LLD on that particular vintage film badge.

If there are no other questions, I could move onto No. 6.

Six has been dealt with before and it deals with the D&D phase. And as we heard earlier, there is every intention by NIOSH to the next revision of the site profile to include the D&D stage. And of course at that time SC&A could be asked to review the new section dealing with the D&D phase. So, you know, that's where we stand there.

Okay. I'll move onto No. 7.

MR. KATZ: Can I just interject?

DR. MAURO: Sure.

MR. KATZ: Since that's sort of

left open, so is there a sort of status update from you guys about --

MR. DARNELL: Just what I said earlier. We've identified some documents that deal with the D&D time period in the way this batch of records that were discovered at the sites and whenever the priorities give ORAU time to do the update, it'll get into the D&D. Don't have a time on that yet.

MR. KATZ: Okay. Not even a general sense?

MR. DARNELL: No.

MR. KATZ: Is this something six months out, or is this something --

MR. GLECKLER: If Tom Propst manages to look at it.

MR. KATZ: Okay. Yes. Okay. Thanks.

MR. DARNELL: I don't have an answer for it, I'm sorry.

MR. KATZ: Okay. Thanks.

MEMBER CLAWSON: Hey, this is

Brad. Are we kind of looking at kind of a total rewrite of the TBD? A lot of this stuff I'm hearing is coming -- is going to be installed into the TBD. So is this a total rewrite, or just --

MR. DARNELL: Actually, it's going to be an update to the technical basis document. What sounds like a lot of information going in, really isn't all that much. If you look at the expanded matrix that we're not using, there's 59 pages of that document. Not all of that document is taken up with the TBD changes. We're probably looking on the order of maybe 10 or 11 pages having to change. That's a wild guess, by the way.

MEMBER CLAWSON: Okay. I'm looking at the expanded TBD on this and there is quite a bit of information. And I was just wondering if this was going to create a total rewrite for the TBD, or if it was just an update. Thank you.

CHAIRMAN SCHOFIELD: There's one thing I'd like to kind of throw out here to put some things in perspective. I should have stated it earlier. In table 6-2 in the un-redacted one, this is from the AEC annual reports, and you look at it from 1960 through '82. And according to this report there are only two people that were reported with a dose in the one to two rem levels. So that, I think, will have a bearing in the TBD and the amount of dose it assigned to those who weren't monitored.

MR. DARNELL: And for Pinellas the highest lifetime dose that was ever monitored on the site is on the order of 3 rem. Pinellas actually offered kind of a challenge with looking at the dosimetry, because we had, like John was talking about earlier, the high end of the dosimetry. And we had good monitoring records for those folks that had dose. The challenge came in because we did have a subset of that group that were at zero.

So you had either zero or dose. And filling in between the middle where you would put your un-monitored worker population, or your coworker, however you want to look at it, was kind of a challenge because you had such a large standard deviation to go with that lower doses. Which is why we came up with the process of assigning 100 millirem to an un-monitored worker, because that didn't represent the upper 95th percentile of all the doses that were seen.

MR. GLECKLER: Something you might want to be aware of is that a 100 millirem 95th percentile dose is based on whole body doses at the facility, which include photon, neutron and tritium dose. And because we couldn't separate them for all the years, it's like we just used the whole body dose. So it's like it's fairly claimant favorable, because it encompasses the internal dose as well.

CHAIRMAN SCHOFIELD: So this also

includes the medical X-rays?

MR. GLECKLER: Not the medical X-rays.

CHAIRMAN SCHOFIELD: It does not? Okay.

MR. DARNELL: And there's a separate un-monitored dose for tritium itself. So basically the tritium component is added twice to the worker.

DR. MAURO: Probably a good idea, especially if you're going to be using tritides also. So you get the tritides and you say, but by the way, we'll also assume he also got a whole body dose from tritium. You put the two together and you're covered.

MR. DARNELL: Yes, it's very clean.

DR. MAURO: No. 7. Go on. When we originally reviewed the site profile, we noticed that there was some mention that nickel-63 and carbon-14 was handled at the facility, but the TBD was silent regarding

nickel. Subsequent to that, NIOSH provided some draft revisions. Actually incorporated into our big matrix there's some test, whether you're going to stay with that or make some revisions to it. But we reviewed that. And you demonstrated that the types of material, the quantities of material, how they were used, is such a matter that it's negligible; less that a millirem per year. So though it's there, the contribution to dose is minuscule and your general cut off is one millirem a year, because that rounds off to zero when you run IMBA. We accept this. We believe that those quantities, that the types characterized by your response are in fact minuscule and do not -- you know, we think this issue is resolved.

I like the material that was provided. It should work its way into the site profile to demonstrate.

MR. GLECKLER: One thing, we'll need to change a little bit of the wording,

because as it turned out, it's like some of the references used for the nickel-63 and that were actually the GE X-ray division Milwaukee site documents that we were using. It's like we've since realized that. And it's like, but however what they were using it for is that I think we can make the argument it's applicable to what an L site was doing with that material. So it's like --

DR. MAURO: Okay.

MR. GLECKLER: And that's kind of what we plan on doing.

MR. DARNELL: We're also looking at just leaving the dose consequence in to be over-estimating. Just haven't come up with a decision on how to do that yet.

DR. MAURO: As far as I'm concerned, it's tractable and you got your hands on the problem.

Eight. This is one of the items that was open until recently. We believe it's been resolved. When we reviewed the site

profile and the records that were behind it, we came across some records that -- a little ambiguous, but it sure seemed like there was some uranium contamination at the site.

The way the literature read was it looked like these depleted uranium beds were used for storing tritium. It's one of the ways in which tritium is stored in the stable form. And at first we didn't think that this could be an important source because it's just a stable bed with the intention of storing material, not that you're cutting it or doing anything, machining it. But then later we found in some literature that apparently there was some cutting of these beds going on somewhere and that someone reported some 5,000 DPM number, which I assume is 5,000 DPM 100 centimeters squared, a swipe sample. We weren't quite sure what it was. But we suspect it was a gross out for -- which is a number that is not very high. It's regularly about 186, folks who are familiar with. But

we had to identify it as, wait a minute, we might have missed some uranium. But then subsequently you came back with a very powerful answer and you folks may want to give that answer.

MR. DARNELL: Basically, Brian, from his review of the site research database, he was starting to recognize personnel who were associated with different sites. In reviewing information for GEXM, he recognized names of personnel that were being attributed to being at the Pinellas site. In researching further, he was able to identify the dosimetric records, personnel records and other information in the documentation that SC&A used to look at the potential depleted uranium exposures and determined that those personnel and those records were actually associated with GEXM, or the GE X-ray Milwaukee site.

With that in hand, we went back to SC&A and showed them where this documentation

trail led. And basically, there was no depleted uranium exposure potential at Pinellas. We did find other documentation from Pinellas that discussed the titanium tritium storage beds which were done with glass tubes, which provide no exposure potential other than the tritium. Then later on the site moved to a depleted uranium storage bed inside a stainless steel tubing which provides no exposure to depleted uranium. And that pretty much sealed this issue.

DR. MAURO: So those cutting and those measurements that we saw in the literature were not at -- they were in Milwaukee?

MR. DARNELL: They were not at Pinellas. They were in Milwaukee.

CHAIRMAN SCHOFIELD: Now, there were some of the tubes, glass tubes that got broke.

MR. GLECKLER: But those didn't

contain uranium metal tritide.

CHAIRMAN SCHOFIELD: Yes.

MR. GLECKLER: It was titanium.

CHAIRMAN SCHOFIELD: But I mean that --

MR. GLECKLER: The generator tubes -- yes, they didn't that.

CHAIRMAN SCHOFIELD: That has been a concern of some of the people.

MR. GLECKLER: Those were other compounds.

MR. DARNELL: Are you talking about the generator tubes, or the --

MR. GLECKLER: Yes.

MR. DARNELL: Yes, the generator tubes, different compounds.

DR. MAURO: Now these compounds, I guess to get back to the second issues, we're talking about compounds that are captured within the type M?

MR. DARNELL: Yes. Do you have that list?

MR. GLECKLER: What we found, it's like -- it's Sc. Is that scandium?

MR. DARNELL: Scandium.

MR. GLECKLER: Scandium tritide, erbium tritide, and then titanium tritide, which is what was used for the early beds, that were stored in glass beds.

DR. MAURO: So when you folks go behind -- I'm just trying to visualize you all's triage, all the different forms. You've convinced yourself by assigning the type M as modeled in OTIB-66 will bound all the different forms you're seeing here.

MR. DARNELL: I'm saying right now it most like will. We're awaiting that decision.

DR. MAURO: And if not, you kick it up to the higher one?

MR. DARNELL: We will kick it up to whatever is the worst case and use that for everybody.

DR. MAURO: Right. Now those

judgments will be made in combination with representatives from NIOSH, SC&A and the Board.

MR. DARNELL: I assume so, yes.

MR. MAURO: Okay.

CHAIRMAN SCHOFIELD: Okay.

DR. MAURO: The last one is -- well, the last -- 9, 10 and 11, I sort of grouped together on my little handout, all deal with occupational medical X-rays. We often, when we review a site profile, find that the approach that's going to be used to assign doses to workers for medical X-rays, you have two approaches you take. One is site-specific. The way say, listen, we have records, we have information about what was actually going on, how frequent the measurements were. And on that basis, you assign the type and frequency of medical X-rays.

Then you have OTIB-6, which was prepared by Ron Catherine, which is very often

something you default to, which we reviewed in depth and we find very favorably. The assignments basically go something like this: For each chest X-ray, it has a look-up table that says here is the dose to every organ for every chest X-ray that you will assume as being your examination. And if it's before a certain date, I believe it was 1970, the look-up table gives a different dose to every organ because of the nature of the design of the X-ray equipment and what was done.

And finally, you also have before a certain date, we default to photofluorographic examinations, which give a much higher dose to each organ.

And when I'm reviewing the case and I see that we use OTIB-6, I sign off. Because as far as I'm concerned, that's a very favorable approach.

But in this case, we found that you weren't doing that. You were doing something more site-specific and it wasn't

apparent to us that it was well-founded. And so the comment came up, you know, you're going to have to defend the specific approach in a better way if you're going to deviate from OTIB-6. And I believe that you have already provided additional material why you believe the approach you're planning to take here makes sense.

I would just caution that. We do have an ongoing dispute on what should be included and what shouldn't be included in the default, the number of X-rays. For example, right now the default approach is when you begin work, and you terminate work, and annually, one of these X-rays, whether it's a lateral X-ray -- depending on the facility and the records, what they say and the time period. Sometimes you assume it's a chest X-ray; that's the annual X-ray, it's a lateral hip X-ray, or it's a photofluorographic examination. But it's only annual. We have lots of material that says, well, sometimes

you may want to include additional ones. There are lots of retakes that occur and there are other reasons during respiratory fit tests; I forget the -- we have a whole list in one of our commentaries, where there may be certain X-ray exams that might be being missed. And by the way, our experience is that some sites the X-ray dose contribution to the organs is not insignificant, and this is probably one of them. Because you have so little potential for external exposure here. So the way in which you treat the medical X-ray, you may want to take a -- I mean, I understand that you're dealing with it.

MR. DARNELL: Yes, I think that the difference with this site is you are actually able to go back to the source person who did the X-rays, interviewed them, got information not only about the technique but the types of X-rays that were done. And that is part of our response in the expanded matrix --

DR. MAURO: Yes.

MR. DARNELL: -- that talks about the interviews that were done.

Elyse, am I getting that right?

MS. THOMAS: Yes, I think so. Then let me also add, too, that OTIB-6 is to be used when there's no site-specific data. And I think for Pinellas we do have the site-specific data. We have the individual X-ray claim files. And so that was used.

DR. MAURO: Right. And you explained that in your response in the matrix. So anyway, I think you have been fully responsive to our concerns in the matrix, and I guess that's going to make it into the next version of the site profile, while you feel confident with that.

And on that basis, you know, our X-ray guys specialize in that have sort of signed -- have signed off.

MR. DARNELL: Great.

DR. MAURO: And we're done.

CHAIRMAN SCHOFIELD: Brad? Bob? Either one of you got any comments?

MEMBER CLAWSON: This is Brad. I was just listening to John when he made his comment that they've signed off on it. I guess I'd kind of wait until I see it in the TBD and how it's implemented.

CHAIRMAN SCHOFIELD: That is what we're planning to do, wait and see how these revisions come out and then we will go through and take a look and see if we agree or disagree with them at that point.

DR. MAURO: Yes, Brad, I'm sorry I used the word signed off. We basically said the material that was provided seems to be responsive to our concerns. And certainly when it finally makes its way into the TBD, at that point in time, you know, it's the work group's decision on what to do next.

MEMBER CLAWSON: Fine. I just wanted to clear that up, John. I appreciate that.

CHAIRMAN SCHOFIELD: Well, if there's no other comments at this time, then --

MR. KATZ: Well, can I ask. I mean, Donna took the trouble to come in, so, Donna, we don't normally have public comment sessions, but you took the trouble to come here. And if you have questions about the discussion today, you can certainly, you know, ask the questions if you need clarifications about what's been discussed.

MS. HAND: Well, I need some clarification, yes. And thank you very much.

Let's go back to the medical X-rays. All right. Even in the technical basis document and in the report on the site profile it says, do not only look at their medical records, but you must look at the X-ray file envelope in order -- for their X-rays. This is not being done. Also, that same nurse that he's talking about, the source and everything, said that she took two X-rays every year. She

didn't just take one. She took a minimum of two X-rays every year. Again, that's not being done. So this is being very selective.

The report does show photofluorography up to 1960. The nurse does not remember taking photofluorography. But however, you have already determined that photofluorography was there. Therefore, that bulletin is required to be used for the workers that were done before 1960. This is not being done.

MR. GLECKLER: Regarding the PFG X-rays from; and I might be touching on stuff that OCAS knows more of, basically from what I understand is like, I think it was someone at OCAS that like reviewed some of the actual films, because the films for the workers are available. And they have written X-ray medical records with the X-ray records and they have the films. And some of those original films were reviewed. And something to be aware with the Pinellas plant workers is

a lot of them were allowed to use the on-site doctor as their personal physician. So you see a lot of medical exposures and sometimes those exposures are taken at the local hospital versus at the Pinellas plant.

One of the things that was observed in a review of those films is they found one PFG film amongst the ones that were reviewed. And the only reason why we assume that there was PFG X-rays performed at the Pinellas plant and not -- whereas on the film you probably could not tell where that film was taken at, and we haven't been able to track down, you know, who did that or where that record is. But in order to go look at the paper record, because odds are the paper record -- I'd be willing to bet money, it would have a header saying that it came from one from the local hospitals instead of the Pinellas plant.

MS. HAND: Excuse me, but the thing is you have already determined that.

You have already issued a bulletin. And to be claimant friendly underneath this program, you are required, and Larry Elliott even stated in the very first working group committee, you are to use that.

MR. GLECKLER: Yes.

MS. HAND: That technical basis for all workers before 1960.

MR. GLECKLER: That is correct.

MS. HAND: Also, the doctor that was used on site and the X-rays that were used on site was for injuries on site. There was a doctor that was called in that read them, which is Dr. Rush. As far as the X-ray films, they did a program to where they got money back for the silver combination out of the X-ray films and they were destroyed, they were shredded and the chemicals were taken out of the actual X-ray films. That's why they were required to go by the X-ray file envelope, not the films, because the films were destroyed.

The uranium, according to the

baseline report --

MR. DARNELL: Can we address one topic at a time, please?

MS. HAND: Okay.

MR. DARNELL: According to the technical basis document that talks about the envelope, the information that is found in Section 3.1 under examination frequencies; I'll read it directly from it, the medical X-ray files contain information about the actual type of X-ray acquired. Number of views, type of view and frequency. This information is quoted on the outside of the storage envelope for the X-ray films. The dose reconstructor should refer to the claimant's medical records for the most accurate information on the actual X-rays performed, number of views and so on. It doesn't say to go to the envelope, but it says to go to the medical records.

MS. HAND: But again, if the medical X-rays are not actually put on the physical examination that they had every year,

but they had a physical examination every year, you would assume that they would also have an X-ray every year.

MR. GLECKLER: We'd go purely off the medical records.

MS. HAND: People have testified that they did.

MR. GLECKLER: The vast majority of the workers did not get an annual X-ray. But when we don't have medical records available, because there was no identifiable frequency for those workers' X-rays, it's like when we have no medical records available, we take the claimant-favorable approach and assume an annual chest X-ray was performed. And so they get all that dose even though it's more likely than not that they didn't receive that many X-rays. And that's just a very claimant-favorable approach that we take on that.

MS. HAND: And that's what I was stating, is that, you know, every year.

Because even in the earlier, it wasn't until the late '80s that they started doing every three years or every five years. But before then it was every year, and specifically the ones that were involved with a lot of the tritium.

The uranium was in the glass as well. The ceramics was a lead ceramic, but the uranium was in the glass. And even the baseline report which was used as a reference for the technical basis document stated that uranium was there in four different forms.

MR. DARNELL: Okay. What glass are we talking about?

MS. HAND: The glass that's in the tritium.

MR. DARNELL: Okay. What era, which glass?

MR. GLECKLER: There are several documents with uranium in the glass, but I don't know of any information that indicates that's ever been considered a radioactive

hazard.

MS. HAND: It has uranium glass, and this is by DOE themselves in their own report, in the baseline report that was used in the technical basis document as a reference item. It states in there uranium glass.

MR. GLECKLER: Sometimes they'll dope it, I believe, for optical properties or, you know --

MS. HAND: The health physics report, the history of the plant also says there was plutonium beryllium. And this is a history of health physics also from DOE. The plutonium RTGs when they first got started was in 1975, but it was inside building 100. Then it was moved to 400.

MR. DARNELL: Okay. Natural uranium glass, specific activity, 6.7 times 10 to the minus seven curies per gram. The glass itself had one times 10 to the minus eight curies per gram. The tritium component of that was 10,000 curies per gram. There is no

exposure potential from the natural uranium at those levels in the glass.

PARTICIPANT: That would be stuck in the glass.

MS. HAND: That's what I'm saying. No, but the glass broke.

MR. CALHOUN: It's not contained within glass capsules. You're talking uranium glass. It's entrained in the glass.

MS. HAND: And you would not have any exposure when you're cut on that glass?

MR. CALHOUN: Very, very little. It's a tiny amount of glass.

DR. MAURO: Give it to me in pica curies per gram. I'm sorry, I don't think you mean what you gave me.

MR. DARNELL: Six-point-seven. The natural uranium-specific activity was 6.7 times 10 to the minus seven curies per gram. The glass itself contained one times ten to the minus eight curies per gram.

What you would have to do is

actually have glass imbedded in the wound and stay in the wound for there to be an exposure potential. And the exposure potential would be extremely small because of the activity levels in the glass.

MS. HAND: Underneath this law, underneath this program, that is all required. Was there potential of exposure there? You are required to characterize the occupational environment. That was required and that's the --

MR. DARNELL: That's not part of the occupational environment.

MS. HAND: Uranium inside of glass that's in a wound, and you got cut on, is not part of the occupational environment?

MR. DARNELL: No.

MR. GLECKLER: You can find thorium in glass in antique stores.

MS. HAND: That's broken?

MR. DARNELL: If we have a record that shows that there was uranium found in a

wound, we'd definitely calculate a dose for that.

MS. HAND: Congress has already made the findings these records were altered. You would never find a record of that because they were not going to address it. The health physicist's dosimetry records at that time even said unless a person has 15 percent more than the highest recorded radiation, they're not going to address it into a wound.

MR. DARNELL: I don't understand what you're talking about.

MS. HAND: I'm talking about the wound bulletin that was issued that says for plutonium, and it can be used for other radioactive nuclides. I'm talking about when people are cut --

MR. DARNELL: Could you please provide us with that in writing, because I can't address anything you're talking about without knowing the source document.

MS. HAND: I shall do that.

MR. GLECKLER: Would a dose calculation help or a hypothetical scenario with someone either in handling X amount of glass, you know, or having an injection-type, you know, wound scenario involving glass to show how much dose can be had from that, or how little dose actually? Would that help matters?

MR. CALHOUN: Uranium is not going to get out of the glass.

CHAIRMAN SCHOFIELD: Have you guys looked at possible medical records, look in there and see what their protocol was for a wound if you were in a contaminated area, because most facilities, I know, if you received a wound in a contaminated area, or potentially contaminated area, they would also monitor the wound to see if there was any contamination. And then it would be treated at that point. Either it would be cleaned up or it would be excised by carving it out.

MR. DARNELL: I'm looking at the

material safety data sheet from Corning for the borosilicate glass which contains uranium. The health information section talks about the glass in dust form only. As an insoluble form of uranium, uranium oxide has a low order of toxicity. Boron poisoning can cause depression of circulation, vomiting, diarrhea and so on. And then it goes on to talk about silicates and the other things.

Basically, the MSDS is telling you you've got to have a powder form before you get to any health consequence from exposure to this. From a health physics perspective, having uranium suspended in a glass matrix is not an exposure potential, not until you get to a dust.

MS. HAND: Again, I disagree. According to this law you are supposed to characterize the occupational environment, and that means all the radiation. The EPA reports at this facility has documented that krypton is in the environment on the outside. It was

monitored on the outside, but yet this is not done. There's no environmental doses at all.

MR. DARNELL: Before we move onto the next radionuclide one thing I think you need to understand is that in characterizing the radiological exposure concerns at any site, that characterization also includes excluding items that are of not exposure potential. Because you don't see an exposure placed on an isotope doesn't mean that it wasn't characterized. What it means is it didn't make it. There is no exposure potential from the uranium. I just wanted to make sure you understood that difference.

MS. HAND: Yes, but that should be addressed in the technical basis document then, to explain to these people that, yes, you were exposed to these radioactive isotopes, however the potential was so low.

MR. DARNELL: There is no exposure potential. There is no need to put it in --

MS. HAND: Then that should be

addressed in the technical basis document because the people should be informed about this in clear, convincing and transparent terms.

MR. DARNELL: You are very much entitled to your opinion.

MR. KATZ: Do you have another technical point, Donna?

MS. HAND: The Pinellas plant is a very unusual plant. This was an open laboratory process quality control production line. Whenever the product was made or assembled at each stage, they had quality assurance. This was a warehouse-type facility where the wall didn't go out. They were not sealed. You know, so everybody was exposed to everything in those rooms. And at each stage they had separate laboratories and they had a laboratory quality assurance person at each stage of the product line. We have neutron generators. There is no neutron dose attract to any of these people. We also had, you

know, many neutrons and accelerated. There's nothing there. They also had industrial X-ray machines and radioactive producing machines. There's no doses attributed there.

MR. GLECKLER: As far as the un-monitored workers go, it's kind of going back to the 100 millirem dose which was calculated as representing the 95th percentile dose. So for 95 percent of the monitored workers at the Pinellas plant we see less than 100 millirem of dose. And it worked out also, it's like about 78 percent of them received less than a total annual dose of 20 millirem, which is about the equivalent of the LOD value of a dosimeter. It should also be noted that those are whole body doses again and they do include photon, neutron and tritium dose. However, for assigning those doses in IREP, it's like we have to pick what type of radiation type and what energy category to assign those as. And we've got, you know, for photon, neutron and tritium, which is an electron-type dose,

and, you know, we can either assign it with those three energy types. Well, it's been determined to be most claimant favorable to assign it as 100 percent 30-250 KB photons. And since we cannot separate the photon part of that dose from the neutron part of that dose, from the tritium part of that dose. And so we've gone through and figured out which way is the most claimant favorable way to assign it and it's been determined to be 100 percent, 30 to 250 KB photons versus any other neutrons.

And there's only a couple exceptions to that, and that's for a couple of the leukemia cancers, to where it's more claimant favorable to give it as neutron dose. However, I'm not positive on this, but I don't think any Pinellas claims currently have those leukemia cancers that's associated with them. And that's been a long time since I've even looked, so that could have changed for the new claims as well.

MR. DARNELL: This section that the technical basis document addresses those workers that were walking around during testing or walking through the labs, or in anywhere associated with the work that was going on that handled radioactive materials is found on the bottom of page 26 and top of page 27 of tech basis document 6, which is the external dose technical basis document. And basically it talks about the dose records from '83 to '93, and '57 to '79. It talks about what the maximum doses that personnel were receiving. And in both cases the dose was right around 500 millirem, half a rem per year, for the highest exposed individuals.

In looking at that, we came up with the 95th percentile dose, which was 100 millirem. That's assigned. There is no other case for it. It's just assigned to the workers that had a potential for exposure.

MS. HAND: Then I did a Freedom of Information Act and I requested what was the

highest. They sent me not only the technical basis, but they sent me a documentation that says the highest external doses. In the early years they were 1.7, 100 millirems. So 1.7 grams was in the highest.

MR. GLECKLER: That was the highest dose for that year.

MS. HAND: You know, and further up. But, however, those people, they were exposed in order to be claimant friendly and receive the highest. They then took the 95th percentile and did the average and put that in for the people's doses, when the method says the highest dose to be used for the same person, when a person is in there. Again, X-raying the product, it's not medical X-rays, but X-raying the product, these people did this. The dosimetry badges were worn on a little necklace thing or on their belt. When they would sit at the lab and work and do their product and everything, that was underneath the table. And then the 2005

technical basis document had mentioned that the 100 millirems was for the tritium. It didn't mention that that was for the other stuff. That was for the tritium. The 2005 technical basis document and information in that, some of that was depleted or turned around in the 2006.

MR. DARNELL: I just want to show you something about the statistics used to come up with the doses. This is actually a curve we used yesterday for something else, but it works very well for this.

What you're looking at is, this is does on this axis--excuse me-- personnel that get the dose on this axis, and this is the dose as it increases over time. And this is what we're talking about, is life time dose to that worker. Okay. Or you can look at it as annual dose to that worker, making their life time very short. All right? The vast majority of the monitored workers stayed at zero or very much less than 100 millirem,

which is right here. We have most of our data on the higher dosed personnel. In other words, the people that were monitored and received the dose, that's where our data is. Okay. We have a whole bunch of workers at Pinellas that were un-monitored because they didn't need to be monitored according to the regulations and requirements for the dates and times over the life of the Pinellas site.

So when you take a look at this, the highest range doses treated statistically, put it on the appropriate curve, what you come up with is that 95 percent of the people at the Pinellas site that were monitored fell less than these higher doses, which we placed at 500 millirem according to the technical basis document.

So what we did to be claimant favorable was assign this 100 millirem to everybody. And like Brian's pointed out, the doses that we have indicate tritium, neutron and photon dose together. So when you take a

worker that was un-monitored, you give him 100 millirem a year, you're giving him both internal and external dose. And then on top of it, in the internal technical basis document you give him internal dose again. So we're giving people dose for every year that they worked at the site, when in reality, if you look at the dosimetric records, you'll have a dose in one month, you have a dose six months later. You may not have a dose until two years later after that for the personnel that got the doses. So now we're saying we give it to them every year. So you have a highly episodic dose, you have a highly skewed dose to the high end and then you turn around and give everybody the benefit of that doubt. There is no way at all in looking at this that you can say these workers are not being treated fairly and don't have a claimant-favorable dose.

MS. HAND: The health physicist report and history that was given by DOE, and

also by the actual manager that worked there, stated that in the early years they did not do the doses to the tritium because they had a lot to learn about it, the badges. You have two memorandums, which is on the technical basis, that even the badges that were used were incorrect. DOE lab has stated that those Mound badges that were given to them also were falsified and, you know, you cannot use those as accuracy data. The badges were --

MR. DARNELL: External badges do not measure tritium dose.

MS. HAND: The badges were chosen as per the health physicist going to the supervisors and saying which ones had the highest dose reconstruction? Without having the supervisors any training on how to determine anything--they just said you choose your workers. This is how it was done in the early years, all the way up into the 1980s. It was the supervisors that had to choose which ones wore the badges and which did not.

And not the health physicist saying, okay, we know for sure you're going to be exposed to this. This came from not only the workers itself, but also the health physicist report.

MR. DARNELL: Okay. I actually see no problem with that. The supervisors would know which workers were assigned to the jobs that got dosed. As long as they were informed of the requirement, and you didn't say the were not informed or it was withheld, there is no --

MS. HAND: It was --

MR. DARNELL: Excuse me.

MS. HAND: And, yes, but supervisors were not trained to determine which one had the highest dose. They were just told just pick a couple of people, and that was it. It was a random choice. The supervisors were constantly told, "But don't worry about it. Nobody had a high dose. There's nothing there to worry about because the dose is so low." So they said, well, how

could we choose then, because you keep on telling us we're safe.

MR. GLECKLER: Is this for a specific time period, or throughout the history of the site?

MS. HAND: Through the earlier years, yes. All the way up into the '80s.

MR. DARNELL: The only way that we could take any --

MS. HAND: Right. You also have documentation in your report, in your technical basis document, as well as the Freedom of Information Act, as well as the health physicist report, that the activity logs are missing. The health physicist activity logs are completely gone, in the 1970s all the way up until 1982.

MR. GLECKLER: We don't have those for a lot of sites.

MS. HAND: So therefore you should use the source, correct, to determine the radiation?

MR. CALHOUN: We use the dosimetry.

MS. HAND: No, you can't use the dosimetry because the dosimetry is inadequate. The records are gone.

MR. CALHOUN: The technical basis document was generated by a bunch of very knowledgeable health physicists. It's just received a review by a group of individuals that are independent of OCAS who are very critical of ORAU. And they found that to be acceptable, our approaches. I think that this document has been reviewed very thoroughly by technical people and found to be appropriate. So digging a whole lot more into this isn't going to be much of a benefit.

MS. HAND: My response to that is that the technical people that you were giving to, did you give them the information that you obtained from the workers? Whenever you met down there, did you give them information that you have obtained from DOE regarding how the

process was? Did you give them the information stating that we have questions about the badges? We have questions about the accuracy of those badges. We also have questions about the activity logs of the health physicist being completely missing.

MR. CALHOUN: We have access to all records that you do.

MS. HAND: So therefore you informed those same people that reviewed it and they still said that the badges were adequate?

MR. CALHOUN: We have a bunch of documentation about the health physics program, the dosimetry that was documented, the practices, the programs that were in place. And all of that was taken into consideration, not only by OCAS as we developed the technical basis document, and ORAU, but also by SC&A when the reviewed the technical basis document.

MS. HAND: I still contend that the

information--how can you do a dose reconstruction on badges that are inadequate, even by their own memorandums from Dr. John Holliday who did it, and also from DOE lab, whenever the DOE lab says you can't use those Mound badges anymore and that's where you got your information from? You know, so how can you say that? And then also, if you've got the health physics activity is missing, therefore any incidents, any corrections in badges, any error monitoring and everything is completely gone. So then how can you determine during that time frame what the radiation or potential characterizing of the radiation could be?

MR. CALHOUN: The Pinellas site was a very low-dose site relative to the DOE sites.

MS. HAND: That is not the issue.

MR. CALHOUN: That is the issue.

MS. HAND: The issue is the workers should have equal protection

underneath the law.

MR. CALHOUN: They do.

MS. HAND: And to their own site.

MR. CALHOUN: And we're giving them very --

MS. HAND: And due process. They should not be compared to other sites. This should be the radiation to the worker at that specific site during that location.

MR. CALHOUN: That's what we do.

MR. KATZ: Can we separate these issues a little bit? The question that Donna is raising about their health physicist saying that their badges are inadequate, is this documentation that OCAS reviewed about the badges?

MR. GLECKLER: I don't recall ever seeing anything on that. And I've been reviewed most of the SRDB documents.

MR. KATZ: So do you have some documents about the inadequacy of the badges that you can provide to OCAS?

MS. HAND: Yes, I do.

MR. KATZ: Okay. Well, I think that would move this forward then. That would be great.

MS. HAND: In fact, I'd do it in a Freedom of Information Act because I want a copy of the memorandum that's in the technical basis document that states that John Holliday wrote a memorandum stating that. It's in the technical basis document, but yet they say they don't have it. If you look underneath the badges, it has -- in fact there's two memorandums, as well as a DOE lab report. And that's all in the technical basis document.

MR. KATZ: So, it sounds like then if OCAS has these documents, then you could just send a note citing the --

MR. DARNELL: Do you have the title of the document that you say is in the technical basis document?

MS. HAND: It's in the external. If you look at the dosimetry --

MR. DARNELL: Do you have the title of the document that you that it's listed in?

MS. HAND: Not with me.

MR. CALHOUN: Do you have a FOIA request in process right now?

MS. HAND: I have several in process right now.

MR. CALHOUN: To us at OCAS?

MS. HAND: Yes.

MR. CALHOUN: Okay. Well, I'm sure that's being worked on.

MS. HAND: Again, on the badges of the doses of personnel only 25 percent of the Pinellas workers were badged. Again, was that 25 percent of different workers, or was that 25 percent of badges? You know, was the information given to them in a batch, or do they have individual and they have determined 25 percent different people were badged --

MR. CALHOUN: Brian, do you hear that?

MS. HAND: -- rather than a batch?

MR. GLECKLER: No. What's that?

MR. CALHOUN: She's asked a question about the statistics of people being badged.

MS. HAND: Was that 25 percent different people being badged, or was that a batch, you know, of 25 percent?

DR. MAURO: Yes, we reviewed that issue and we were concerned, especially in the early years. Only about 25 percent of the workers were badged. Now, in response to that, and we talked about this a little earlier, NIOSH provided, in the matrix, which is publicly available--you should be able to get a copy-- provided numerous quotes from the literature that says there was by design only a small fraction of the workers were in fact badged. And the rationale being that they only badged workers who had the potential to be exposed to 25 percent of the radiation protection standards, which were probably five

rem per year at the time. So the idea being, at least initially, only a small -- so there were numerous folks from the Radiation Protection Program. On that basis, we believe there's a paper trail that demonstrates that in fact was the case, that that's what was done.

Now, what you're indicating, and I'd be very interested in, is that, see, we're saying that if you have that data and it's clean, it hasn't been tampered with, it hasn't been in any way deleted, you could build -- only though it's only 25 percent of the workers who were badged, you could build a curve like this that says that this is the way those people were exposed. Most people had very little. A small number of people had fairly large. And we could probably place an upper bound on what the upper end dose was for people. People who were badged, then of course you have a record.

And people who weren't badged,

here's where a judgment comes in. People who weren't badged, the presumption would be if they weren't badged based on that policy, it's likely they were probably not people that had a potential for upper bound. But if there's some question regarding that in the person's record, for whatever reason, and this is when you now are doing it case-by-case, here's where the judgment comes in and here's what we were talking about earlier. In principle, if you have a robust curve that isn't undermined because of poor practices, destruction of records, deliberate falsification of records, taking records and not wearing the badge because you're concerned you're approaching a limit, there were a whole bunch of reasons why this could be corrupted. Okay. We do not have any evidence that that occurred. There's nothing that we have that says we can't believe this curve. We believe that this curve, based on everything that we reviewed, is a fair representation of the distribution

of exposure experienced by the workers.

Then if you accept that -- okay. Now, and we have.

MS. HAND: Okay.

DR. MAURO: That doesn't mean -- you know, based on what we've reviewed.

MS. HAND: Okay.

DR. MAURO: If there's additional information that we haven't seen, I think everyone would welcome taking a look at that information that possibly could affect this. And then we have to factor that in. But right now, from the information we have, we're saying I think we can hang our hat on that. And then we're looking to a NIOSH dose reconstructor to use that information intelligently when they apply it to particular cases. We have a real worker. Are we going to apply it down here, are we going to apply it over here? Or maybe there will be cases where you decide you want to give this guy the upper end for whatever reason. And it's at

that stage where, of course, that it leaves the site profile world and goes into the dose reconstruction audit world.

MS. HAND: Correct.

DR. MAURO: So, I mean, right now you have made mention of a number of issues that I think certainly provide us with that information, because you may have information we haven't looked at. And I think that may affect the credibility of the distribution. I'd love to look at it.

MR. KATZ: Let me just add to that. Yes, I mean, OCAS could be the receiving -- SC&A will receive whatever new information we get. But just to make another point, the door is always open for new information. I mean, so even after the TBD comes out, if the Board says this site profile looks great and we're happy with it, should it come to that, the door is still open always for new information. And the new information can always change everybody's understanding of

what they already know. So, yes, just to make that clear.

MR. CALHOUN: A point of clarification is that the film badges or the TLDs don't detect tritium. I don't know if you said that on accident before.

MS. HAND: No, I did not.

MR. CALHOUN: Yes, okay. They don't detect tritium.

MS. HAND: No.

MR. CALHOUN: Okay.

MS. HAND: I know. In fact, the badges only detected I think anything above an MAB? Everything that didn't go down to low. They didn't go very low at all. They were all high ranges. So even the low ranges would have never been detected to begin with.

MR. DARNELL: Actually, that's incorrect. The badges do go down to a certain cutoff point, which we call the minimum detectable level. We actually add dose to workers that were monitored to cover between

zero rem and whatever the minimum detectible level was. That does change over time with the site, and that's accounted for in the technical basis document.

DR. MAURO: I could help out a little bit. Well, whenever you have a film badge --

MS. HAND: Yes.

DR. MAURO: -- it's calibrated for the energy distribution that you expect to experience.

MS. HAND: Right.

DR. MAURO: And that was one of our concerns, especially during the early years. We weren't quite sure that there was appreciation of the characteristics and the performance, and the calibration methods used for a particular film badge that we used. Now, when you think about a film badge, think about two things. It's seeing a certain flux.

MS. HAND: Yes.

DR. MAURO: And you have to get

some minimum amount of photons striking that before you see anything. That currently is about 10 millirem per change out. So if I was wearing a film badge for a month and I experienced less than 10 millirem, you wouldn't see anything on that. Now if you go back to the older days, they weren't as sensitive. You'd have to get 40 millirem. Now if I wore it for a year, you know -- so think of it like this: If it's less than 10 millirem per change out, it's going to read less than detectable level.

MS. HAND: Yes.

DR. MAURO: That's one question. That's the amount of energy that's impinging on it. Now the energy itself is the energy of these little photons that are hitting it, they could go from very, very low to very, very high.

MS. HAND: Yes.

DR. MAURO: Usually in the keV, kilo electron volts, to the MeV range.

MS. HAND: Yes.

DR. MAURO: Now, this was a question we posed because we were concerned. If you don't calibrate your film badge for the energy distribution you're dealing with, and so that when you see a certain degree of blackening you could relate that blackening on the film badge to the energy. Now, that blackening is not only affected by the number of photons that are hitting it. It's also affected by the energy of each photon.

MS. HAND: Yes.

DR. MAURO: Well, we looked into that and we have certain concerns in the early days, whether or not they had a good handle on it. We looked at that issue and we walk away thinking they do have a good handle on it. So, I mean, that's what we've done.

Now, any additional information that says no, we want to see it.

MS. HAND: Okay.

DR. MAURO: I'm sure you want to

see it.

MS. HAND: That's my only concern, because the people have told NIOSH, have told OCAS, has told the Department of Labor, has explained everything about the radiation doses that were there and that they were told to, you know, put it in a badge or say you've lost it. So, you know, the badges are not adequate. You cannot use the badges to extrapolate or to determine a dose that's with accuracy.

DR. MAURO: See, I'd like to hear more. See, we didn't find that. No, we didn't find that. But if you have something that we have to look at, we want to -- because that could happen. I mean, there are circumstances where that could happen.

MS. HAND: Right. Because they said that the Albedo dosimetry -- okay?

DR. MAURO: Okay. That's a neutron dosimeter.

MS. HAND: Right. That it was

just worn loosely on their lab coat. And so they're moving back and forth. They would, you know, go behind something. They would turn. So therefore, it would not, you know, get the actual doses. They were told to also put them in their desk where, oh, yes, I got to turn this in now and put it in the desk drawer. The gentleman that told me that he was the process engineer, his badge was worn on his belt. Well, when he would work on the product itself, which was in the tritium room, which was 108 and 109, he would, you know, be sitting at the lab itself in the base working here with the stuff. His badge was underneath the table.

The gentleman that actually detonated and tested the triggers, he was given no neutron doses at all. He actually tested the triggers. He had to do three of them per group of unit. If those three did not prove, then he had to go ahead and do more. You know, so that's why I'm saying that

-- and he was not monitored.

DR. MAURO: I don't think I'm leaving the scope of my obligations to the Board by saying this. Our mandate when we review a site profile is to interview workers, interview experts, including folks like yourself, and gather up and document everything we found out. Now, I was not the one to do the interview work. Others have. Unfortunately, the person that was leading this up is in the hospital right now.

Right now you're putting on the record what I would consider is material that is equivalent to an interview.

MS. HAND: Correct.

DR. MAURO: And one of the obligations we have at SC&A is to take into consideration all the information that's put on the record by people that we interview. You are effectively putting on the record what I consider to be valuable information related to an interview. And when we review a site

profile, we have an obligation to take into consideration all that information. And I also believe we have an obligation to make sure that the concerns you have expressed are communicated or answered, your questions are answered either in reports that really go to the Board, but should demonstrate that we listened, you know, to what you have to say and here's where we come out.

I cannot speak right now off the top of my head to issues related to the credibility of the film badge records, whether they're albedo film badge records. Right now I could say that what we did review and why we came out where we came out. You've raised a couple of questions that, you know, I'm uncomfortable trying to respond to right off the top of my head.

MS. HAND: Okay.

DR. MAURO: I'd sure like to see them. Because right now, I think we've crossed a few boundaries. We've talked

neutron dosimetry and we talked photon dosimetry. We also talked uranium contained in glass material at a level that I can't tell intuitively whether 10 to the fourth pica curies per gram of uranium in glass is it's just a no, never mind, though maybe it could be something. I just don't know.

So, you know, I respect everything that you're bringing up. Again, I think it should be documented, it should be tracked and we should have a response to it. That's what I believe we have an obligation to do. And I feel I have an obligation to the work group and the Board to say that we looked into the issues you raised and have a recommendation or a finding related to these matters. Because a lot of the things you've brought up are not explicitly addressed in our work.

MS. HAND: I agree. Thank you so much.

And that's all that the workers and, you know, as an a advocate of the

workers, is all that we're requesting, is that you do attribute the doses at the Pinellas plant to the workers that they should receive. The way that their work process was, the way that they did their work product, we have documentation from two security guards that came up to Ohio. They went through the "Christmas tree light." They were the only two out of 14 that lit up and they were both from Pinellas plant. You know, so security workers even got doses that were not addressed. But yet because, you know, you're saying, well, because they're not work process they wouldn't have had any doses.

DR. MAURO: Right.

MS. HAND: We had maintenance workers that got only 100 millirem when they were on top of 108 cleaning up the tritium dust that had been accumulated up there. You know, so how can they only have 100 millirem when they actually had to physically clean up the dust and vacuum it, you know, every so

often, you know, in the upstairs?

We have a gentleman that was a welder that cut down the HEPA stack that had radiation to it. They only gave him 100 millirem.

MR. KATZ: I think it would be great, Donna, if you would in a letter just sort of lay out all these, including all these incidents that have been reported to you and spoken to people about, and send that in so that it's on paper, you know, dated and on record. And then we'll certainly be certain that SC&A, as well as OCAS -- I mean, we'll send it into OCAS. SC&A and will get it and then they can look at those one-by-one and see what's there.

MS. HAND: Well, is the protocol okay if I send it to both equally?

MR. KATZ: Absolutely.

MS. HAND: Send it to Phil?

MR. KATZ: You can send it to all of us. You're absolutely welcome to do that.

CHAIRMAN SCHOFIELD: Some of the information you've sent me, I have sent on to other people who are in better --

MS. HAND: Thank you.

MR. KATZ: If you send it to Phil, I'll make sure it gets to the right places.

CHAIRMAN SCHOFIELD: -- more knowledgeable than I am about the health physics.

MS. HAND: Right.

CHAIRMAN SCHOFIELD: That's not my area of expertise, I'll tell you.

MS. HAND: And the thing is, is that I know that they have a Pinellas template. And that Pinellas template, they only address the tritium at .9-something. They do not address the neutrons at all. This was neutrons generating plant. They had EBs. You know, they actually did the testing of the neutron triggers. And to say that it was included, no, there was also neutrons that was not included into their doses. Otherwise, why

in the earlier years did they monitor plutonium and they monitored neutron? In the technical basis document it even stipulates the missed neutron doses, but yet and their dose reconstruction people, underneath their professional judgment, they do not apply this to the workers.

MR. GLECKLER: I tried to explain that with the unmonitored doses on that site.

MR. CALHOUN: I think the best course of action is really just to get the documents and look at the technical documents and respond to those.

MEMBER CLAWSON: Hey, Phil, this is Brad.

CHAIRMAN SCHOFIELD: Yes, Brad?

MEMBER CLAWSON: You know, it seems like a lot of this would have been captured in a worker outreach. Have they had that down to Pinellas? I think they did in the earlier years, but I was just wondering.

MR. DARNELL: We actually had

outreach meetings through last year. We haven't have any this year. But I was at Pinellas outreach meetings several times, including a day-long session to basically go through the technical basis document in relation to three different types of dose reconstruction so that the interested personnel could understand exactly how the dose reconstruction was done. That meeting was also attended by staffers from Senator Nelson's office.

DR. MAURO: Well, SC&A, Kathy Demers and Abe Zwiten visited the site, spent a few days interviewing and took notes. The degree to which they captured the material you're telling me, but perhaps not. And, you know, I think it's important and I'd have to talk to them. Unfortunately, they're not on the line. It may turn out that they do have some insight into the issues you're raising and that has been discussed. I don't know.

The first thing I'm going to do

when I get back to the office is talk to them. Because I don't think we have -- whether our interview notes -- let me see. Hold on a second. Give me one second. Sometimes the interview notes don't --

MEMBER PRESLEY: Hey, Phil, this is Bob Presley, while John's looking for his notes.

DR. MAURO: Yes, they're here. You know what would be very helpful to us? I can't give you a work group, but we have an attachment that's called attachment 2. It's on the web; it's cleared, and it has a summary of interview notes that reflects SC&A's interview along with the other's that -- I'm going to read this again, of course. But we may have missed something that might be very important. We're receptive to that.

CHAIRMAN SCHOFIELD: There is another point that I'd like to make, and this is not an uncommon thing in a number of facilities about people being told their

badges behind and stuff. And I'm not denying that it went on. We know of some facilities, I truly believe some facilities, that they were told to do this, but that is a negative. And it is very hard to prove that negative. Who did, who didn't, how much dose they missed. And that is one of the most difficult things when you have the claimants, the people saying, well, this went on and then you have to go back and try and figure out which of these people were. So it is a difficult problem for the health physicist and for the Board to deal with in trying to determine how much dosage was missed, how many people this affected. You know, I mean, it's a difficult problem. It really is. And I wish that anybody knew a real good way of handling this.

MR. KATZ: Bob? Were you trying to get a word in Bob Presley?

MEMBER PRESLEY: Yes. I think we ought to wait and let's see what these papers say. I'm real interested in seeing what the

lady's brought up versus the interviews. So we ought to go ahead and wait and let's see what this stuff is.

MS. HAND: I also know that the REMS database that you can get on line for the Pinellas plant. If you go to Pinellas plant -- or Lockheed only goes to 1990 and then again in 1994. There's two. But that's a batch of data. And in there, they even had one that goes '08. So this is during the last years and during the decontamination years. And then go to the REMS data everything and they showed that. And they show that the majority of it is within the 30 to 250 range during that time and everything. But whenever you try to get the REMS data of years before that, it is not there. And these would be the batch doses. Again, according to the guidelines that established that if NIOSH cannot find, you know, documentation to refute what the claimant has been saying, then the error is on the side of the claimant. And the

information that we give when we do the OCAS closeout interview is being ignored by NIOSH. They are ignoring all of the claimant information. They're saying, well, you did not consider this. I actually did this.

For example, the guy that did the actual cutting down of the stack. He informed them, I cut down the stack and you're telling me I don't have it? And he had myelodysplasia syndrome, which is a leukemia. He didn't make it.

MR. KATZ: Donna, you're also welcome to provide information about individual cases from people who told you about their individual dose reconstructions and so on. I mean, another role that John mentioned at one point in this meeting is they also review a sample of individual dose reconstructions. They're not going to review the ones necessarily that you raise, because they review random samples of these. But the issues that you raise, if there's issues there

that need to be looked at, that's something else. It's really better not to be raising individual issues --

MS. HAND: Correct.

MR. KATZ: -- on the telephone, because these people all have a right to their privacy.

MS. HAND: Correct. I understand that very much. So, thank you for your time. Thank you for allowing me to speak.

MR. KATZ: Thank you, Donna, for coming.

CHAIRMAN SCHOFIELD: Well, I guess we'll see what these documents tell us and at that point --

MEMBER CLAWSON: Phil?

CHAIRMAN SCHOFIELD: Yes.

MEMBER CLAWSON: I think now John says that he's going to look into it and so forth. I just want to make sure because they are working on this. We don't have to task them with anything more, but I'd just like to

kind of echo what Mr. Presley had said that we look into this documentation and also the interview notes and so forth.

MR. KATZ: Brad, this is already within the scope of what they've already been tasked with.

MEMBER CLAWSON: Okay. I just wanted to make sure.

MR. KATZ: Yes. Thank you.

DR. MAURO: I'd like, yes, to make sure that I understand what our action item is. My understanding right now is that there's one action I'm going to take right away, and that is to talk to folks that prepared attachment 2 to our review of the site profile. I took notes on everything you described, as best I could, talking about the extent to which that's captured or was discussed. I'll review it. So that's not very extensive. And I could actually get back to the work group about, you know, the degree to which SC&A has explored some of these

issues as part of our interview process. And that will be the end of it, and that's going to relatively quick and minor, the level of that.

When you do deliver your material, I'm assuming that what shows up to everyone involved, we have the green light to take a look at it within the context of the issues that were raised. So those are my two action items.

MEMBER PRESLEY: This is Bob Presley. SC&A and NIOSH is also going to get a copy of this, aren't they?

MR. KATZ: Bob, the working group will, too.

MEMBER PRESLEY: Thank you.

CHAIRMAN SCHOFIELD: You got anything else to add, Brad?

MEMBER PRESLEY: Yes. No, not at that time. Can't get my phone off mute. Sorry.

CHAIRMAN SCHOFIELD: Okay. Then I

think that's -- Go ahead.

MR. KATZ: Yes?

PARTICIPANT: I have a question. I'm a public caller. I had a question regarding item No. 8.

MR. KATZ: Yes, item No. 8. You mean potential for miss-dose completed in uranium?

PARTICIPANT: And of uranium contamination, uranium beds used to store tritium?

MR. KATZ: Yes. Yes, go on with your question.

PARTICIPANT: Okay. I wanted to know, you said something about 5,000 DPM is suspect. Is that what you said?

DR. MAURO: Oh, yes. This is John Mauro from SC&A. We came across some records that were handwritten and it appeared that from looking it the number was 5,000. And we tried to figure out what we were looking at. And our best guess is DPM are 100 centimeters

squared. It's very common, when a person takes a sample of a surface that's contaminated with radioactivity, they'll take a little piece of cloth or paper and smear it, which would pick up the contamination on the surface. And they count the amount of radioactivity that's on that smear, or piece of paper. It's standard procedure to look for surface contamination.

We don't know what those numbers were, but the context in which we read the handwritten document seemed to indicate that it might have been 5,000 DPM or 100 centimeters squared of surface area of possibly uranium. And when we saw that, we said, gee, we feel like we have an obligation to bring that to the attention of NIOSH and the work group. And then we also had some information that it looks like perhaps these uranium beds that were used to store tritium might have been cut. So you put those two things together, you say, maybe there was some

potential for the generation of uranium particulate material that sort of settled out on some surfaces.

Subsequent to that, we found out that that particular document that we saw was not applicable to Pinellas, but to a guess a pilot plant for Pinellas that was located in Milwaukee. That resolved our issue.

PARTICIPANT: Okay. Now you mentioned a product called scandium and erbium in this report?

MR. DARNELL: Those were our potential tritides for the site.

PARTICIPANT: Okay. And you found none of those potential tritides at Pinellas plant?

CHAIRMAN SCHOFIELD: No, those were found at Pinellas.

PARTICIPANT: Okay. All right. So you did find scandium and erbium at the Pinellas plant, but that was not part of that item?

MR. DARNELL: No, they are in the literature for the Pinellas plant. We did not go out and physically verify that this material was there.

PARTICIPANT: Okay. All right. Well, I am very aware that erbium was at the plant. I know that for a fact. But I don't know if you knew that, but I just wanted to bring that up. That's what geared my mind to thinking in terms of that.

CHAIRMAN SCHOFIELD: It is one of the ones that is listed for Pinellas.

PARTICIPANT: Okay. It was used? I mean, you know that it was in the Pinellas plant, correct?

MR. KATZ: Right. Right. You're just supporting the documentation that they reviewed in preparing their materials. Thank you.

PARTICIPANT: All right. Well, I just wanted to make sure that you knew that. Okay. Thank you.

MR. KATZ: Thank you very much.

CHAIRMAN SCHOFIELD: There is at least in the documentation one plutonium beryllium source, if I remember right.

MR. DARNELL: Yes, there is.

CHAIRMAN SCHOFIELD: So, I mean, that's documented that they used a source for calibration for instrumentation. That is also in the documentation.

PARTICIPATION: Yes, they also cut that, too, at the plant. I mean, they used it in the machine shop quite extensively. I mean, it's very expensive to purchase, but it was quite extensive use to touch those tubes.

CHAIRMAN SCHOFIELD: They cut their sources, the plutonium or beryllium?

PARTICIPANT: They used erbium in the machine shop.

CHAIRMAN SCHOFIELD: Oh, okay. Okay. I'm sorry. I misunderstood you.

PARTICIPANT: I'm sorry I wasn't clear on that.

MS. HAND: I would like to know the date of that smear for that Milwaukee thing, because Milwaukee was moved down into Pinellas plant and it was inside the plant. What was the date of the smear?

DR. MAURO: I'm going to pass the baton to these folks.

MR. DARNELL: It was early in the plant operations.

MS. HAND: But that's what I'm saying, it's not a separate site. Milwaukee was moved to Pinellas plant. They worked inside the plant. So what was the date of the smear that you got?

MR. DARNELL: Originally it was a separate site.

MS. HAND: No, originally it was in Milwaukee. Then move down in the '60s to Pinellas plant.

MR. DARNELL: Exactly.

MS. HAND: So that's what I'm saying. Was the date of the smear earlier

before the 1960s, before they moved down to Pinellas plant? Because that was the Milwaukee group.

MR. GLECKLER: It was around 1966, I believe, when all the activities at the Milwaukee site finally transferred to the Pinellas plant and none of the neutron generator work was being done in Milwaukee. Whereas Milwaukee did other stuff, I believe, other than just that.

MR. KATZ: So the record that they were referencing is a record from the earlier period from Milwaukee when there were operations in Milwaukee.

MS. HAND: When it was there. So we've got the actual date on that, because we want to make sure --

MR. KATZ: They have the records that would confirm --

MS. HAND: Okay. I would like to get a copy of that date, please.

MR. DARNELL: You need to submit a

FOIA request for --

CHAIRMAN SCHOFIELD: They have the document numbers of that record.

MR. GLECKLER: Yes, it's easy for us to look up.

MR. DARNELL: We can get it easily. We just don't have it here.

CHAIRMAN SCHOFIELD: Yes. No, I don't have a copy of it either here. I do have a list of some of those documentations from Milwaukee. There have been document numbers.

MR. DARNELL: If you have the document number, would you let Donna have that, or Ms. Hand have that so she can get her --

CHAIRMAN SCHOFIELD: Unfortunately, she won't be able to access those documents.

MR. CALHOUN: Yes, but she can make the request that way.

CHAIRMAN SCHOFIELD: Right. She

can make the request. But I mean they're not on the open -- they aren't --

MR. GLECKLER: Refer to those numbers that you -- just a list of the ones in the TBD that had been identified, or was that particular one that she's inquiring about wasn't one of the TBD documents?

CHAIRMAN SCHOFIELD: These are some that were used in the TBD and they were in reply about some of the MILFWOG documents. And that's a list of the numbers of some of those documents.

MR. CALHOUN: Oh, so you don't know for sure which one --

MR. GLECKLER: Yes, that's just the ones that were in the TBD. It's probably not the one she's looking for.

MR. DARNELL: Yes.

MS. HAND: That he was talking about. That's what I'm saying.

CHAIRMAN SCHOFIELD: Yes, those may have some information for her. That's,

you know, without having the documents right in front of us.

MR. DARNELL: This will actually lead her astray compared to the document she's looking for.

MS. HAND: Correct.

CHAIRMAN SCHOFIELD: Oh, okay.

MR. DARNELL: Yes.

CHAIRMAN SCHOFIELD: That's the only copy I had of some of the documents from Milwaukee with me.

I think we're done.

MR. KATZ: Okay. We are now adjourned. Thank you, everyone, for attending, including everyone on the phone, board members and others, members of the public, and Congressional staff members.

(Whereupon, the above-entitled matter was concluded at 11:36 a.m.)