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CENTERS FOR DISEASE CONTROL
NATIONAL INSTITUTE FOR OCCUPATIONAL
SAFETY AND HEALTH

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ADVISORY BOARD ON RADIATION AND
WORKER HEALTH

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WORK GROUP ON PORTSMOUTH, PADUCAH AND K-25

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WEDNESDAY
JULY 6, 2011

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The Work Group convened in the Zurich Room of the Cincinnati Airport Marriott, 2395 Progress Drive, Hebron, Kentucky, at 9:00 a.m., Phillip Schofield, Chairman, presiding.

PRESENT:
PHILLIP SCHOFIELD, Chairman
HENRY ANDERSON, Member
JOSIE BEACH, Member

ALSO PRESENT:
TED KATZ, Designated Federal Official*
ELIZABETH ALGUTIFAN, ORAU*
JOSEPH FITZGERALD, SC&A
TOM LABONE, ORAU*
JENNY LIN, HHS*
JOHN MAURO, SC&A*
JAMES NETON, DCAS
CHUCK NELSON, DCAS
JODIE PHILLIPS, ORAU*
BRYCE RICH, ORAU*
MICHALENE RODRIGUEZ, ORAU*
MATTHEW SMITH, ORAU*
JOHN STIVER, SC&A
ELYSE THOMAS, ORAU*

*Participating via telephone

C-O-N-T-E-N-T-S

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

9:00 a.m.

MR. KATZ: Let's get started then. This is Ted Katz, Designated Federal Official of the Advisory Board, the Advisory Board on Radiation and Worker Health, the Portsmouth, Paducah, K-25 Work Group.

Roll call beginning with Board members in the room, and please speak to conflict of interest as well.

(Roll call.)

MR. KATZ: Very good. Just let me note there is an agenda for this meeting on the Board's page, on the Board's webpage, but we're actually going to do things in a different order.

I think we're going to begin with Paducah, and it's your agenda, Phil. Take it away.

CHAIRMAN SCHOFIELD: Okay, Chuck. Since you've been working on this so hard,

we'll let you lead off.

MR. NELSON: Okay. All right, Joe, how do you want to do this? Do you want to lead off with a comment, or do you want me to, or how do you want to do this?

MR. FITZGERALD: I think on Paducah and K-25, we provided comments. And I think you've actually responded.

MR. NELSON: Yes.

MR. FITZGERALD: So, why don't we just do it that way.

MR. NELSON: Okay.

MR. FITZGERALD: You can go ahead and tee it off, and then I can respond.

MR. NELSON: Okay. Yes, in the first meeting that we had was in December of 2010, we went over the Paducah site.

And while several actions were closed out or items were closed out of the matrix, there were some that required further actions.

And so, what we did is we provided a response. And SC&A came back on June 16th, 2011, that would be the date at the bottom of this matrix, and they provided comment to what we provided as we felt was a good resolution.

So, those that are closed out, I don't intend on going over. But the ones that required some NIOSH action which may or may not be closed out right now, I'll go over each of those.

The first item would be Item Number 5. And that one there was a NIOSH action. And they were asked to review the available references regarding the estimation of external dose to the - to skin contamination.

And what we did is we reworded the response, and we wanted to better describe the process and documents used to estimate skin and extremity dose.

And, you know, these documents

already existed, but what we wanted to do was put them in the TBD so that the DR has a clear direction to where they can assign skin and extremity dose.

And what we did in our response, we talked about the modeling programs; VARSKIN, Microshield and ATILLA. Those all can be used to calculate skin dose, including dose to the extremities.

And what we say in our response is the TBD will be updated to include those references to assist with the calculations of dose to the skin and extremities. And it's also going to include OCAS TIB-10 and 13.

TIB-10 is a best estimate for glovebox workers, but it also talks about some - how to deal with geometry issues.

And then OCAS TIB-13 is a TIB that's titled "Selected Geometric Exposure Scenario Consideration for External Dosimetry at Uranium Facilities." So, that could be a

helpful TIB as well, and also OTIB-17 which is "Interpretation of Dosimetry Data for Assignment of Shallow Dose." Those will all be referenced in the TBD so we had a clear path.

Then SC&A had a response to that which they provided on June 16th.

MR. FITZGERALD: Yes, and I think we were satisfied that the references that would be added, would make this a little more complete in terms of that particular item.

The one issue that we're going to come back to, I think, in all the gaseous diffusion plants, though, is how skin and extremity doses are addressed and what is the context of technetium, or just in general.

I think that's an issue, you know. I went back and really looked at the Site Profiles and also the review comments that we provided in our original review, and I think there's just a discomfort - excuse me one

second.

MEMBER BEACH: Sorry. Sorry.

MR. FITZGERALD: A discomfort about how the skin doses - potential skin doses, that pathway, and extremity doses are addressed at the three gaseous - this is more of a generic issue.

And, you know, certainly the SOP for not just these sites, but all sites, you have the VARSKIN and you have different models that you apply based on the CATI interviews and, you know, maybe incident records so that, you know, the dose reconstructors can apply those models and estimate a dose.

I think what I'm reading - and, again, I wasn't involved in all three of these reviews, but what I'm reading is a concern that in some cases depending on the particular work that the worker might have done at one of these gaseous diffusion plants, it would have been a relatively routine exposure potential

to - whether technetium or other elements that would have given you an elevated skin dose, in some cases a fairly hefty elevated skin dose, and it's not clear that's really an episodic in nature in all cases, that in some cases, it actually strikes me as more of a routine exposure that the worker would have had to deal with.

And if they weren't particularly careful about deconning, you know, sort of religiously, they probably would have picked up a fairly steady, you know, skin dose over time.

And so I just - I want to open up just the discussion on behalf of the Work Group on, you know, certainly in the TBDs, the approach is to provide what I would call illustrative examples of, you know, here's how somebody might have been exposed and here's what could be done in terms of modeling and exposure, and I think I understand that.

That's just to certainly guide a dose reconstructor. Here's several different ways you can deal with that, if that is an issue that comes up.

But I think the concern that underlies the comments that were made in all three Site Profile Reviews is - and I'll treat them, deal with this in a broader sense because we pick it up for technetium, pick it up for this issue, and each of the Site Profile Reviews has the same sort of commentary.

And one issue is just simply providing more background, which is I think what you've done. You've identified more references and given more guideposts to the dose reconstructor.

But in a broader sense, the question is, is this truly leaning more toward episodic where, you know, you can look at the CATI interviews, you can look at, you know,

the incident reports and decide whether or not to go through this process -- this is the dose reconstructor now -- to decide to assign a skin dose or maybe an extremity dose, or do you have a situation, which is kind of what I'm reading through in terms of the operation descriptions, where certain job categories that would have likely been part of the job.

There would have been an exposure potential that the worker would have confronted almost every day in some way or another, and the issue being that there wasn't a good way from a dosimetry standpoint to measure what that dose might have been.

I'm not saying it's an SEC issue. I'm just saying that there's a certain question of how one would attribute the skin dose and beta dose to workers, particularly if there wasn't any dosimetry, when you knew in fact that there's certain operations -- and we kind of know what those operations are, you

know, like certain parts of the cascade -- where you do get technetium, you do get some of these elements.

How would you actually, you know, guide the dose reconstructor to say, you know, not only does this person, you know, have an exposure potential, but perhaps that person should get credit for a skin dose that wasn't measured, but would likely have been received?

And that's what I'm picking up more, you know, there's referencing issues as far as providing enough information to the dose reconstructor, but I think there's also a question of whether or not we have worker categories where you do have, you know, more exposure potential of a chronic nature versus an episodic.

I just want to open that up. I know we have some of the authors of the TBDs on the phone as well.

This is really for all three.

This is not just one of them.

MR. NELSON: Yes, we're talking about a broad subject here. So, maybe we ought to narrow down what the issues are.

Because when you say that we're talking about skin dose, I mean, they had film badges. They monitored shallow dose.

So, if you're talking a protactinium which is your major dose that you're going to get from a shallow dose from uranium, that's a pretty high-energy beta.

You can see it certainly on a dosimeter. And if it gets to a person's whole body, it's going to be on their dosimeter.

So, they did record shallow dose on dosimetry. And so, we have a method for that.

And then if you have an individual with extremity cancers, then we have methodology for assigning dose to extremities based on those film badges using geometric,

you know, depending on the geometry or location on the skin. And that's what we make reference directly to those procedures and how to calculate that.

MR. FITZGERALD: Yes, there's two issues here.

MR. NELSON: Right.

MR. FITZGERALD: I just want to make sure I -

MR. NELSON: I want to know which issue you want to talk about.

MR. FITZGERALD: Okay. Let's talk about both issues.

One issue is the source term. And let's use technetium, because that's certainly a bit of a bad actor at the three gaseous diffusion plants.

And in the site description of Portsmouth, I'm sure it's in all three, actually, you're dealing with also not just the nuclide, but the chemical compound.

And this is a quote from the site description for Portsmouth, but probably would apply to all three.

Technetium - I'm not sure if I'll say this right - pertechnetate, that's the technetium 04 as the compound -- is also difficult to remove from the skin and can, therefore, cause significant skin dose from contamination.

And this shows up in a number of cases. It showed up as well from some of the Health Hazard Evaluations.

The particular chemical compounds adhere to the skin very well. Let's put it that way. And unless you're careful to, you know, to really scrub this off after you're exposed, you're going to get a fairly hefty skin dose just because it is adhering to the skin. I'm talking about the extremities, arms and whatnot.

I don't know how you can use some

of the modeling techniques to really figure out what that may give you. And that's why I'm just trying to find out based on the approach in the TBDs, it suggests certainly there's models where you can do that.

I don't know how you would approach something where you would get something that would be a chemical compound that would be adhering to the skin. Not just loose contamination, but -

DR. NETON: Yes. Well, I mean, we're specifically not talking about skin contamination, I guess. Not shallow dose from external radiation.

So when we talk about external contamination, certainly if our skin is capable of handling a dose calculation to tech-99 on the skin, which is a fairly low-energy beta emitter -- at 300 Emax, you average about -- so, it takes a lot of contamination to give you any kind of

significant skin dose.

But this is not unlike any other site where unless we have some confirmed evidence of an incident that occurred with some numbers, there's no way we can calculate a skin dose.

I mean, we can't go and speculate that everyone had X thousand dpm per hundred square centimeters on their skin, and assign all work crews that kind of dose. I mean, we would have to have some knowledge that an incident did occur.

But if it occurred, there is no technical reason why we couldn't calculate a dose to the skin.

MR. FITZGERALD: Yes, and I guess that's part of the issue on technetium. I think in general that at the gaseous diffusion plants, skin exposure was in fact a fairly significant exposure pathway.

And, you know, even the Site

Profiles acknowledge that, you know, by operation and also by certain levels where you had the, you know, rem per hour exposure. So, it was a fairly hefty -

DR. NETON: Well, let's differentiate between shallow dose to the skin from an external beta source, which you can get high skin doses.

And as Chuck said, they had dosimeters that can measure the low-energy betas to the skin. The dose to the skin. The shallow dose. So, I mean, that's okay.

But, again, skin contamination, if we have evidence there was an incident, we would calculate it using the VARSKIN code.

The only other issue out there then is this sort of geometrical issue which is, you know, where are your hands in relationship to the badge that's on your lapel? And then if we know the geometrical relationship, it's an easily calculable value.

MR. FITZGERALD: Well, I guess I still question -

MEMBER ANDERSON: It's not an episode.

MR. FITZGERALD: Well, I guess I just question whether or not one can write off skin dose as being -- outside of some demonstrable incidents, as being not noteworthy at the gaseous diffusion plants. I think there is enough record.

And again, you know, it's hard to -- and I agree it's hard to pinpoint exposure that happens every day for a particular operator, but even in the TBDs it notes that you have technetium plating out in various parts of the operation.

Anyone that was cleaning out the cascades or involved in CIP/CUP would have been more than likely exposed quite significantly to skin exposure.

And what my concern is, is I don't

disagree that, you know, you have a modeling process. I just am concerned that we're treating it as an episodic exposure where I think if you brought any workers in, it's certainly not episodic.

Although, the dilemma is at the gaseous diffusion plants because you're dealing with this day in and day out unless there was a release of some sort that was above and beyond the normal, it would have been reported as an incident.

So, you sort of have that dilemma where you are getting exposure. But what you're saying is that, well, unless it's reported and flagged, it won't count as a potential dose.

I'm just trying to understand from a Site Profile standpoint, how do the workers get addressed from the standpoint of this routine chronic contamination to what I would think would be lower levels which are

characterized as such in the Site Profile and other reviews.

I mean, it's not something that no one says, look, it happened. It's just I don't quite understand, you know, why there isn't any consideration by job categories or worker operations as to, you know, what is a bounding, you know, dose from -

MEMBER ANDERSON: Would that have been proportionate with all if it's an ongoing day in and day out thing, to the external measurements?

MR. FITZGERALD: Not necessarily.

MEMBER ANDERSON: I mean, I don't know.

MR. FITZGERALD: I understand the concept that, you know, you have weak betas in your clothing, in your gloves or whatever you're wearing.

MEMBER ANDERSON: Yes.

MR. FITZGERALD: Okay, that's

probably going to get you - that's going to deal with that issue. And you have your stronger betas and you have your dosimetry that would record that no question.

But it's not clear to me how you deal with skin exposure where you're not going to have any response unless it's so heightened that it's dealt with as an unusual event or an incident by the site.

And that would be a pretty high level given the kinds of contamination you had at the gaseous diffusion plants.

MR. STIVER: This is John Stiver.

It sounds like what you have here is an unmonitored exposure potential here that's poorly characterized in terms of who may have been on the receiving end of this.

But it does sound based on the information that Joe's provided that, you know, you have a chemical form that adheres to the skin, you have a lot of this material, and

there's certain groups of workers, the CIP/CUP workers in particular, that could have been chronically exposed to skin contamination. That's not something that would necessarily register on a dosimeter.

You have the techniques, you have the models in place to address it, it's just how would you go about trying to -

DR. NETON: Well, how would you do it?

MR. STIVER: I just put it out there to talk about it.

DR. NETON: I understand you're trying to ask us to prove a negative that the skin contaminants didn't occur.

If we have evidence that they were there -

MR. STIVER: Well, maybe it's -

MR. NELSON: It's an exposure issue to the skin. You have contamination. You're going to see that recorded in their medical

records if you have skin contamination, and they're going to do things about it.

I mean, they can measure that with a beta/gamma dosimeter - I mean, with a frisker.

If you're seeing people being contaminated, you're not going to let that continue to be a chronic issue. You're going to deal with it.

MR. FITZGERALD: But here's the issue I have, you know. I'm trying to reconcile an acknowledgment in the TBDs, and I am going through the site description and everything. I think it's acknowledged that you have these exposure pathways and they're in chemical compounds which afford close proximity to skin, adhere to skin.

In fact, it goes on further to say, you know, you really have to go through some trouble to get it off your skin.

And the notion that one can deal

with it as an incident-based exposure potential, it doesn't -- to me, it just doesn't quite come together.

DR. NETON: I get the impression as workers are out there, bare skin with open hands in a contamination area with no gloves on, short-sleeved shirts. I mean, I just don't see that scenario, Joe.

I mean, where does that happen? Even in -

(Simultaneous speaking.)

DR. NETON: Well, I'm talking about working with material. Okay, your clothing, your anti-c could get contaminated.

And unless you're sticking your head in there, you know, you could get some incidental. But again, I think that would show up as an incident on some frisker at some point.

CHAIRMAN SCHOFIELD: I got a problem there as that -

DR. NETON: I don't know how -

CHAIRMAN SCHOFIELD: -- with people who have this chronic exposure to the extremities, is that I can't find any place where they wore wrist dosimeters or dosimeter retainer rings or anything and, you know, I don't find a good description of the equipment with respect to this.

Did they work behind some kind of shielding to protect extremities? So if that's the case, your badge isn't going to pick up as much as you would hope it to -

DR. NETON: That's true.

CHAIRMAN SCHOFIELD: -- from the extremities exposure standpoint.

MR. NELSON: That's why you have to deal with it on a case-by-case basis. I mean, you don't calculate extremity dose to an individual that has some contamination.

(Off-record comments.)

MR. NELSON: You know, one thing

that might help you, there is a Reference ID. It's 13683. And this is an evaluation that was done in March of 2004 by Paducah.

And they went through these scenarios you're talking about. And they used some smear data. And they took worst case data and they did some analyses for individuals.

And they evaluated what the exposure potential would be for those individuals, you know, and they made some assumptions. And that might be something that would help shed light on all this.

MR. STIVER: So, it sounds like this has been looked at, at some point in the past.

MR. NELSON: Yes, they did. They looked at -

MR. STIVER: At least have some kind of a proof of principle as to what the maximum doses could have been or worst case

scenario.

MR. NELSON: Right. And, I mean, I can go through the - I have it right here. I mean, we can maybe write a White Paper on it.

I don't know if we're going to -- if you want to mention that, Jim, or --

DR. NETON: Yes.

MR. NELSON: I don't know to what extent you want to go to that. I don't know, but it may be worth reviewing that.

DR. NETON: But it sounds like what we're talking about here is some - I won't call it a justification, but some discussion of why our approach to doing incident-based assignment skin doses is appropriate here and sort of bracket what the doses are.

I'm looking at the average shallow recorded dose that any worker might get here, and they're all pretty consistently 500, 600, 700 millirem per year. With maximum doses, it goes hugely high. There's 11, 10, eight rem

depending if some of those workers that were working with this material, with big GSDs, two to three -- GSD of three.

So, it was recorded. You have the shallow dose measurement. You have the information to say what was the shallow dose exposure of these workers.

Then the issue then is what is different about their exposure from the lapel monitors and what they're doing with their hands?

And secondly, what, if any, potential for skin contaminations are there that the badge wouldn't record? That's what we're talking about.

And Chuck - I don't know about this document that Chuck just referred to that talks about surveys. But I could tell you from my experience at other sites, skin contamination on the surface, unless it's huge, does not give you much dose.

For uranium, you know, normal uranium, you're talking nine millirem per hour for 10,000 dpm per hundred square centimeters or something like that continuous. Tech-99, it takes a lot more. It's a very low-energy beta.

So, you know, unless the skin contamination grows to the level where they were fairly significant which it would be picked up as incident-based issues, we're not talking about much dose here.

I'm not sure we want to have a program that goes and starts assigning some hypothetical skin contamination to all workers at all times.

MR. STIVER: Well, because then you're on the hook for -

MR. FITZGERALD: Yes, I'm just simply saying let's reconcile the statements in the current NIOSH TBDs with what you've just said.

Because again, let me just go back to the TBD. This is the site description on Page 11 of 38 in Portsmouth. Technetium, and I've named the compound, is difficult to remove from skin and, therefore, cause significant skin dose from contamination.

And then later in the tables, there's facility-specific tables, and I can't remember which gaseous diffusion supports it, but facility-specific tables identify the exposure potentials by nuclides and by facility.

And technetium, again, is listed as -- by facility as a significant radionuclide of concern from the skin. And, again, the organ of interest is the skin.

So, the TBDs characterize it as a radionuclide significance as a significant skin dose potential.

And -- but when you go back and actually look at the, you know, the guidance

to the dose reconstructor, it does kind of point to an episodic context.

And now you go back to the operational descriptions, and very clearly in the operational descriptions, NIOSH has characterized specific operations as involving -- I hate to go back to technetium, but that's the one that's easy - involving exposure potential to technetium here, there, you know, specific instances. And I'm just trying to reconcile that, okay.

If it is an exposure potential that's an apparently routine one, and by the operational descriptions it appears to be, and it would be a significant skin dose potential as described in the site description, then I'm wondering, is it enough to simply say go, you know, check the CATI interviews and see if there's any incident reports.

Because it does -- it strikes me as it's characterized as more of an ongoing

routine exposure potential of significance, rather than something that happens occasionally.

It doesn't seem like it's consistent.

DR. NETON: This tech-99 is an issue that comes up in another location. I'm not sure it's relevant for this particular - although, I'm confused now because SC&A has recommended closure of this item.

MR. FITZGERALD: For the references, but I want to make sure we don't lose the context because this -

DR. NETON: Well, I think this will come up again in another -

(Simultaneous speaking.)

CHAIRMAN SCHOFIELD: But in one respect, I mean, what I want to say is what was their criteria there for a reportable incident?

Was it you had to have a certain

level of, say, skin contamination before it's reportable? Did you have to have positive nasal smear to be reportable, or, you know, what was their criteria as a reportable incident?

DR. NETON: Well, certainly in the later years there would be friskers in and out of the area.

We'd have to go back and look at the early years, what they are -

MR. SMITH: I've got some information on that. This is Matthew Smith with ORAU team.

The Paducah section in the external TBD is 6.5.2. The title is "Estimating Missed and Unmonitored Shallow Dose."

DR. NETON: Okay.

MR. SMITH: And as you go through this, it kind of gives you the rundown of how VARSKIN is -- can be used or is used to

estimate the technetium-99 dose.

The specific question that action level is 25,000 dpm per hundred square centimeters as you go through that section, you can see how a calculation was worked out for situations where the dose reconstructor might expect that the claimant was exposed to technetium-99, but maybe there's nothing specific in the record. But there's a big, like you say, a description of the work they did.

So, everything is laid out here on how to calculate that dose and apply that dose in the IREP. And this is also I know in the K-25 TBD as well.

DR. NETON: But I think, Matt -

MR. SMITH: It's pretty well addressed, I think, in the section for Paducah and also for K-25.

DR. NETON: I agree the methodology is laid out, but I guess the question is what

was the site's action levels early on for identifying skin contamination as being --

MR. SMITH: It looks like it's quoted here as 25,000 dpm.

MEMBER ANDERSON: How was that found?

DR. NETON: Do you have a date for that number though, or -

DR. MAURO: This is John Mauro. Could I just step in with a couple thoughts I had?

I understand the problem. In fact, very often I'll raise this issue at sites that have airborne uranium, you know, at these AWE facilities, and of course the gaseous diffusion plants.

Jim, I think I understand the problem is that - well, let's assume for a moment that a person does have a cancer whether it's on the skin of his hand, or on the neck, his face, ear. We run into that

very often.

And I understand that the way in which you do your dose reconstruction is to base it on the open-window film badge reading as if the non-penetrating exposure is basically something at some distance, not this little particle that just happened to land on the person's hand or neck.

And the trouble is, and I totally agree, well, what are we going to assume? And of course the argument could be made, well, that would be picked up during his exit survey scan, and he'll be decontaminated.

But I think we do have a lot of feedback from folks who live in this world on the Board that, well, you know, you don't always survey the person that might be leaving. Especially in the early years.

And there are these sites that have this problem. So, well, then, how do you get a handle on this? And I was listening to

the conversation and someone mentioned to me that there might be a lot of data.

I'm visualizing a site where you do get these particles becoming airborne, and then settling down on surfaces.

So, in a way if you want to start at least to say, well, what potential magnitude of the kind of exposures - and, Jim, you pointed out if it's technetium or it's uranium, you know, the actual dose that - the point that skin underneath that particle is, you know, you have to make a lot of assumptions. What's the size of the particle? Was this specific activity? That sort of thing, but I think you might actually have a handle on that from two sources.

One would be I'm sure if and when those types of things happen, that is little particles are airborne and they settle, that on occasion they will settle on the film badge, the open-window film badge itself.

The probabilities are small, but, you know, we'll say out of the thousands and thousands of people that wear film badges, on occasion they must have seen some hot spots or some spots on the film.

Second, they do perform surveys of surfaces, you know, whatever it is, wherever the surface is, to get what is the dpm per hundred centimeter squared level of contamination.

So, what I'm getting at is through the back door, there's probably a way to start to get a sense of the potential magnitude, let's say, of the specific activity of the particles or of the surface contamination that might have occurred at a site like this where you could start to say, well, we -- if it did occur, it's unlikely that the exposure to the - that location on the skin could have been greater than some number.

The number, the hook for that

number would be either something that you could get from the surveys that are performed, the open-window surveys that are taken close to surfaces, and also any film badge that may have experienced one of these small, I guess, clusters or stars that you would see on a film badge from a particle that deposited.

I'm just trying to find a way to come at a problem that is almost impossible to solve.

MR. STIVER: In general?

DR. MAURO: I don't know what Jim and you folks did. Do you think that this strategy for starting to explore ways of getting a handle on this is worth pursuing, or is it really if we did chase it down, it may be a dead end?

MR. STIVER: This is John Stiver. Could I say something here?

DR. MAURO: Yes.

MR. STIVER: This SRDB 13683 that

Chuck mentions, they used swipe samples from the sites with the highest values, and then modeled that.

And also, I see that looking at the TBD on Page 22, they have some numbers that were modeled using VARSKIN. And the shallow skin dose rate from uniform tech-99 skin contamination is 0.0016 mrem per hour per dpm per square centimeter.

So, you know, if you have an estimate of what the concentration of the stuff would be, the aerial concentration, which it sounds like there may be, then it would be possible to integrate this over a period of time.

So, you know, this is a point estimate. This is a, you know, an mR per hour. But, you know, over a period of time we could estimate this -- they show right here that the resident's half time of one-and-a-half days assuming a shower would be effective

in removing that, you'd get about 0.081 mrem per dpm per square centimeter.

So, the potential is there for big doses. And it looks like we have some of the information that would allow us to bound this.

It may have already been done. It's just maybe a matter of tracking down some of these proof of principle calculations that were done earlier.

DR. NETON: Yes, I don't know. I think you sort of get in this area of sufficient accuracy on these things.

I mean, you know, you're making up a number to put a number on there, and anybody could have been exposed to any concentration just like Joe described, you know. You touch some kettle, it's got a million dpm per, you know, a hundred square centimeters tech-99.

I mean, these numbers, although interesting, I'm not sure how they really depict reality.

DR. MAURO: I understand what you're saying.

DR. NETON: These people are wearing anti-c's for the most part. You got a scan on your neck, or your face, or your, you know, I don't know where you're not wearing anti-c's.

It would be hard - I think it's hard to come up with any kind of -

MR. STIVER: We spent a lot of time working on this with the Atomic Veterans because then you have fresh fallout.

DR. NETON: Yes, and that's a little --

(Simultaneous speaking.)

MR. STIVER: -- doses, but here you've got very low-energy betas. You still have that - where you really get the dose is the integration over time, you know.

We spent a lot of time working on what's the effective removal from showering

and so forth.

DR. NETON: Well, right. I mean, everybody is taking showers after a shift presumably.

MR. STIVER: Yes, and then in this particular case, you have a chemical form that may be resistant to removal.

So, I see how it could be a potential unmonitored dose that's kind of -

MEMBER ANDERSON: But we probably need some written justification.

MR. FITZGERALD: Again, I think just making - maybe making it clear in the Site Profile, you know, where one does make the statements that, you know, one is a fairly substantial skin dose potential that it, you know, exists in a number of operations as a potential, and then in the methodology section, you know, it sort of strikes the note that, you know, if in fact it's established that there was an incident, then, you know,

one would have different tools available.

And I think the references help. I just want to make sure the context is that there still is discomfort over having it described in that context, and then having the methodology guidance, the dose reconstructor in the context of, you know, episodic exposures. It just doesn't seem like it's as consistent.

Maybe there's an explanation that's missing that says, yes, you do have these high potentials and it could be a significant dose, but, you know, we don't believe it's a chronic issue because -

DR. NETON: Maybe we need to go back to what Matt Smith wanted to. There seems to be a lot more description in the TBD than I remember about how you deal with it and how we would assign someone even if there were no records of incidents, some skin dose, some -

MR. NELSON: Yes, it tells you how you can make some assumptions.

DR. NETON: Right. And maybe we can describe that a little better and maybe provide an example of a case where we've done that, you know.

MR. NELSON: One of the facilities does provide an example.

Matt, do you know which one it is? I don't know if it's Paducah or K-25, but one of them gives a scenario. We can make some assumptions.

MR. SMITH: It's really kind of laid out in the section that we're talking about, the 6.5.2 in the Paducah. And it shows up as 6.7.2 in K-25, but it really does kind of lay it out for this unknown situation. It bottom lines it at about 240 millirem for the year.

MR. FITZGERALD: What would trigger the -

MR. SMITH: And that's kind of a monthly - they give the example of assuming a monthly event that maybe was not captured in contamination reports because, again, it's tech-99.

But they're assuming in this calculation, again, using the action limit of 25,000 dpm which, you know, kind of provides the basis or the floor for this calculation.

MR. FITZGERALD: But that would be -

MR. SMITH: The DR is still free to kind of adjust this either downward or upward depending on what they're seeing for work activity.

MR. FITZGERALD: I guess that's my question. What would trigger - I mean, this is a - again, this is a tool that could be applied, but what would trigger the use of that tool by a dose reconstructor?

MR. SMITH: Well, again, they're

going to be looking for, you know, what their described work history is in a CATI, you know.

Jodi and company if you want to chime in on that as well, because you three are working these claims all the time.

MS. ALGUTIFAN: This is Elizabeth. Portsmouth.

There's a nice writeup beginning on Page 40 of the external TBD regarding how to treat skin contamination.

Now, I will admit I have had some questions from dose reconstructors over the last - well, fairly recent weeks, in fact, about, you know, one DR had a situation where he had somebody working with magnesium traps and said that they were contaminated, but there were no incident reports to indicate that.

So he said, well, you know, I've got this section in the TBD. I'm going to try that, because we honestly don't have a lot of

cases where we've used this section.

And I think perhaps it's not clearly enough spelled out in the section as to what job categories and what locations this should be honed in on. So, that's what I'm thinking in my TBD revision that I'll go into more detail about how this should be applied and where.

DR. NETON: Okay. I'm looking here. I think this action limit needs to be fleshed out a little better. It's 25,000 dpm per hundred square centimeters for tech-99.

That was the actual limit for work surfaces and hand tools. So, I don't know. It seems like maybe we ought to go back and sort of shore this up a little bit as to how this is applied. That seems to be the crux of the issue here.

I don't disagree, you know, with this approach. Short of applying it to everyone, though, I don't know what else we

would do.

And I guess the concern here is that how equitable it is across the board.

MR. FITZGERALD: Yes.

DR. NETON: And I understand that.

MR. NELSON: And was it a chronic issue for most people? I don't think so.

MR. FITZGERALD: No, and I don't think it was either. I think -

MR. NELSON: Technetium was a contaminant in recycled uranium which constituted a small percentage of the material processed.

MR. FITZGERALD: There was only two spots.

MR. NELSON: And it went into certain areas and concentrated in certain areas. So, we're not talking about everybody on the site.

MR. STIVER: No, it's going to be a distinct category.

MR. NELSON: We're talking about a distinct population.

MR. FITZGERALD: No, but I think, you know, I think she touched it a little bit, you know. It's a bridge between, yes, it was in fact a potential that, you know, if you did certain things on the cascade, you would have been exposed not just episodically. You probably just would have exposed as, you know, doing the job, whether it's dismantling the cascade, CIP/CUP, or something like that.

And in those cases, I could see applying these tools routinely and saying, you know, we don't know, but, you know, you're likely to have been exposed, and come up with some kind of estimate.

And it doesn't strike me as that much different than probably what we're going through on recycled uranium as well that, you know, trying to figure out, you know, certain processes, certain campaigns, certain years

involved, you know, transuranic contamination.

But you wouldn't do it for all years, you wouldn't do it for all operations, and possibly only certain workers in those cases.

I think in this case, we're focusing on technetium, but I think that would bridge the acknowledgment that you do have that potential and it could be significant.

And the fact that you could narrow it down to aid the dose reconstructor, you have certain operations, certain worker categories would have likely been exposed, that kind of thing.

MR. STIVER: Yes, and that's pretty similar to the approach taken in the latest -- recycled uranium in the White Paper for Fernald.

So, like at certain periods of time when the - those highly contaminated materials came through, those different sets

of defaults were for those periods and certain categories of workers for others.

MEMBER BEACH: So, it sounds like NIOSH has the action here to clarify this. And then do we - should we go ahead and leave this in abeyance?

MR. FITZGERALD: No, not this issue.

MEMBER BEACH: Not this one?

MR. FITZGERALD: I don't disagree with Jim. I just wanted to make sure, though, that it wasn't -

MEMBER ANDERSON: The discrepancy we just -

MR. FITZGERALD: It wasn't an issue of just simply better references. I think that was one issue, but the probably weightier issue is this: the references help, but the context of having the tools, but not telling you how to -- when to and how to apply the tools is more important, actually.

So, I think the tools are better described. So, this can be closed, Mr. Chairman.

CHAIRMAN SCHOFIELD: Okay.

MR. FITZGERALD: But I was afraid, you know, we would lose that thought. And this will take care of the issue when we come up to it later. So, we won't have to -

CHAIRMAN SCHOFIELD: If it happens again.

MR. FITZGERALD: Right. So, the question of the references, I think, is closed.

MEMBER BEACH: Okay.

CHAIRMAN SCHOFIELD: Okay.

DR. NETON: Chuck, are you taking notes here on these?

MR. NELSON: I'm hoping the TBD owners are taking notes.

DR. NETON: It really revolves around -

(Laughter.)

MEMBER BEACH: Someone needs to be taking notes.

DR. NETON: It really revolves around the discussion of what we're doing in 6.5.2 of that TBD and discussing how we actually equitably capture people who could have been exposed to skin contamination, particularly tech-99, and how we would do that.

MR. NELSON: I don't know what it would apply to besides tech-99.

MR. FITZGERALD: I don't either. I think tech is the one that comes to mind.

MR. NELSON: So, Issue 5 is closed.

MR. FITZGERALD: Six is closed. Seven is closed. Eight is closed. Nine.

MR. NELSON: Okay. Number 9. That one was marked as in abeyance and we were asked to verify maximum source term values.

And we went into the - this was

maximum source term that I used for technetium-99, neptunium-237 and plutonium.

And we went directly to the references, the PACE document, Table 7.9 on Page 88, and verified that the max values were in the current table in the TBD.

And we also went to Bechtel Jacobs' 2001 report on Page 30 and 31, Table 2.4.1, that's the recycled uranium mass balance report, and made sure that we were using the max values and they agreed with the TBD. And SC&A actually agreed to our action.

Any discussion on that one?

MR. FITZGERALD: Yes, that's fine.

MR. NELSON: So, that one everybody agreed is closed?

MR. FITZGERALD: Yes.

MR. NELSON: All right. Number 10. This one has to do with particle size and we were given in abeyance. And we were - it says NIOSH to verify particle size assumption.

Now, what we use is the current ICRP 1994. We assume five micron AMAD. And SC&A's question was, is -- I guess there was mention in some of the other documents of smaller particle sizes.

And SC&A wants to know that -- how is that reconciled with the statement that no particle size study was located for Paducah? The issue is whether any data exists that would obviate the use of default particle size of five micron.

And our response to that is that we don't know of any adequate particle size study that was done at the site. So, we're using what the ICRP recommendation is of five micron, which has a distribution that Jim could probably talk about more, but we think that's an adequate depiction and the right thing to use.

MR. FITZGERALD: Yes, I think there - our question there was simply - and this was

in the original Site Profile Reviews that there's a reference to fume size particulates and a 1-micron size, I think.

I'm looking for the reference. And it was - that study is actually, I think, in the SRDB.

So, we had a question about reconciling that reference with using the ICRP.

And what I'm hearing you say I guess in a sense, is that that would not be seen as an actual particle size study.

DR. NETON: Right. And I don't think there was actually any particle size study done at Paducah itself.

MR. NELSON: Right. If you go to the PACE document, which was an evaluation performed by the union and University of Utah, they made the statement no actual particle - this is a quote: No actual particle size study - I'm saying quote, but I'm not using

the right words.

The quote is: no actual study of particle sizes at Paducah gaseous diffusion plant, and that included the location of measurements, measurement methodologies and the result of measurements has been located.

MR. FITZGERALD: So, even if there was a measurement, that wouldn't be considered a study for purposes not defaulting to ICRP.

I think it's a matter of threshold.

DR. NETON: Yes, I mean, there may be indeed some operations that have slightly different particle size distributions in the default ICRP.

But on balance, we feel using five with the geometric standard deviation of 2.5, it's not a monodisperse aerosol, it covers adequately the waterfront of those operations lacking any definitive particle size studies that were conducted at that site.

DR. MAURO: This is John.

In one case, I do recall - I forget what site it was. It may have been Bethlehem Steel -- where you had knowledge that there might have been fumes because they were using a torch to cut things.

And when that occurs, you're generating fumes which have particle sizes which are below one micron. I think you actually assume 0.1 micron in that case.

So, all I'm pointing out is that when there is affirmative evidence that there might have been circumstances or operations where the default five-micron AMAD median value may not apply, it seems that, you know, you have in the past.

And now, if we have a circumstance here where there's some evidence where there might be indication from studies, site studies, that that distribution may not always hold up here because of certain types of

operations, that seems to be the strategy that was used before, and it seems to be one that could be applied here.

DR. NETON: Well, I don't think there are any site studies here. I mean, there are a lot of different operations, and I would agree that five microns does not cover all operations. But on balance, I think it does.

You know, you've got typically a lot of operations that have larger particle sizes than five microns.

And you've got to be careful when you talk about 1-micron atmospheres. If you're talking AMAD, uranium being heavy is going to be much larger than - a 1-micron mass median diameter aerosol is much larger when you talk about uranium as an aerodynamic mass median diameter.

MR. FITZGERALD: Well, I think, you know, what John's pointing out is kind of our

situation is that we actually have a referenced measurement of an operation involved fumes where you had -- I'm looking for the actual citation, but I think you already have it.

DR. NETON: I don't know that it was at Paducah though, was it?

MR. NELSON: Yes, I think there was a discussion in Baker --

MR. FITZGERALD: It's Paducah -- oh, Baker. I'm sorry.

MR. NELSON: 1987.

MR. FITZGERALD: Right. And I guess this gets down to maybe a broader policy question which I think you touched on earlier, what is the threshold by which one would accept for a particular operation, a documented measurement that is different than the five.

And I think in this case, the Baker study did identify fume level

particulate size.

MR. NELSON: Well, I meant the Baker study. First of all, the Baker study was a study of recycled uranium.

So, it was focused on that. It's not the entire site. But he made some statements about -- and, you know, I don't know where he's getting his information from, but he made some statements.

I don't know if it by itself is adequate to say that, you know, that it was -- how true it is. Let's put it that way.

Not that it's a lie or anything, but, anyways, he said that the U03 powder handling had an AMD of about 10 micron. The Green Salt Plant C-420 dust was approximately 10 micron.

He said the fluorination towers, and I think this is what Joe was referring to, it says the -- I don't know if we had it written it down here -- U02 F-fume of about --

AMAD of about one micron. And then it said airborne clean-out 3.5 to seven micron.

And he said, however, his conclusion to all that was he was going to assume an AMAD of four micron for all of his calculations for that area.

DR. NETON: So, you sort of have a weighted average type approach. You got a bunch of operations with 10 micron, we're using five, I mean, do we go and now start saying, well, that operation is five, the other one is five, this one is ten?

I think five is a fairly good -- recommended by the ICRP as sort of a default. I don't know.

MEMBER ANDERSON: I mean, the concern would be if it was a lot finer.

MR. FITZGERALD: Yes, I'm just saying --

MEMBER ANDERSON: I mean, once you get --

MR. FITZGERALD: Yes, yes.

MEMBER ANDERSON: So, the likelihood, I mean, five is -- makes it all respirable.

DR. NETON: It wouldn't make a difference in the dose.

MEMBER ANDERSON: Yes.

DR. NETON: I mean, you know, some calculable difference in the internal exposure.

MR. FITZGERALD: As far as NIOSH policy then as far as applying the default of five, if you do have countervailing site-specific evidence, and I guess I'll put evidence in quotations, I'm not sure how that would be, you know, what evidence would in fact be persuasive.

And I'm not saying the Baker -- you know, the Baker report is what it is. So, you know, if that doesn't rise to a point where it would be used as a site-specific data

for a particular part of the operation --

DR. NETON: Well, you have a couple things to weigh in here. One is that I think -- I'm trying to remember Bethlehem Steel. I think John is right.

I don't know it was 1.1 micron aerosol, but we had a specific operation where a person was cutting uranium with a torch. And that was the only person that did that.

So, here you have a job class where their only potential exposure there -- and we did change the default to a small particle size to accommodate that operation.

Here, where you have various operations around the plant, and by that report that Chuck just read, you have a variety of different particle sizes all within the same operation, unless you get some guy that is just doing that constantly, I don't know how else you would, you know -- it doesn't seem correct then to assume that

everybody in the entire facility breathe 1-micron particles for their entire career, which is where we would be driven to in that situation.

MR. STIVER: No, you have to have the granularity that you can show us particular job type, particular exposure.

MR. FITZGERALD: Well, I think this is just a question of when one defaults and when one doesn't, under what conditions.

Because in our review -- let's make it easier. This is straight from our review.

MEMBER BEACH: Are you looking at Page 56 there, Joe?

MR. FITZGERALD: 54 of the --

MEMBER BEACH: 54.

MR. FITZGERALD: -- Paducah review that will reference particle size.

MEMBER BEACH: Yes.

MR. FITZGERALD: And we talk about

two reports. The Baker is one, and then there's the Bruner 1960. And there, it's a broader review.

MR. STIVER: Page 94, the references here is a neptunium-237 contamination problem, Paducah, Kentucky. That was in the SRDB.

MR. FITZGERALD: Yes, and again it's just sort of reconciling those findings, site-specific findings with default.

Now, the Bruner one actually is a little bit more of a concern. I guess --

MEMBER BEACH: Because that goes down to 0.5.

MR. FITZGERALD: Yes, it says 0.5 for general dust particles at Paducah. But again, one has to judge the, you know, how the study was done and whether one wants to treat that with sufficient scientific credibility that it would, you know, again contradict the five micron.

But it does sort of raise the question of on what basis does one default when you have site-specific particle size reviews?

MR. STIVER: Well, Jim's point is a good one. I mean, you have a whole distribution of particle sizes. And this particular paper may have concentrated on one operation or, you know, who knows what the basis for that is.

I mean, you know, you can be fairly confident when you factor in all your uncertainties if you're using five as kind of a median value, that you're going to probably bracket most exposure potential.

DR. NETON: Like I say, it's got a GSD of two -- I think it's 2.5 is the size. So, it's not monodisperse aerosol.

And then I don't know what these studies have done and what the distribution of those particles are versus, you know, versus a

2.5 GSD default.

I mean, there's a lot of additional uncertainty and --

MR. FITZGERALD: Well, okay. Just not to beat this to death, just the response to the issue was no specific particle size study was located at Paducah.

Now, I guess I'm not -- I'm a little confused that these don't -- I guess, if these don't count as studies for whatever reason, because they weren't done in a way that would be considered a credible or technical approach or not applicable enough or something, that would be the basis for ruling them out. But if they do represent site-specific studies, then I guess you could make that statement. But you might, like you were just saying, saying, well, but five is okay because looking at these studies, it's a reasonable distribution.

So, the response is what I'm

trying to --

DR. NETON: Yes, I understand what you're saying. We probably need to go back and -- based on what I'm reading here in your report, it seems like there were some studies done.

I mean, I'm a little bit confused as to why we came out saying that there were no studies.

CHAIRMAN SCHOFIELD: Wasn't there an analysis? I assume they had the in-house chem department where they would have -- part of their analysis would be particle size, wouldn't it?

DR. NETON: Well, if these were done at Paducah, I'm sure there are data there. You know, you don't just take an aerosol and say the particle size is exactly three micron.

I mean, you come out with some kind of a distribution on a cascade and --

MR. STIVER: Yes, they've got a cascade factor, and then look at the -

DR. NETON: And you look at the different stages and so forth. I think we need to go back and look at that a little closer.

MR. FITZGERALD: I was going to say that technology existed even back in the '60s.

DR. NETON: Oh, yes.

MR. FITZGERALD: So, I don't think that would have been too mysterious.

DR. NETON: No.

MEMBER ANDERSON: And then likely to have recorded it. So --

MR. FITZGERALD: Well, I'm just saying, you know, I'm sure the study -- if there's any documentation behind the study, it would show the distribution.

MR. NELSON: So, what study are we talking about that we have?

MR. FITZGERALD: Well, there's two

studies. The Baker and the Bruner.

MEMBER BEACH: Right. They're on --

MR. FITZGERALD: Those are the two that --

MR. NELSON: I don't think, though, that you could classify Baker as a particle size study.

MR. STIVER: It's sort of an ancillary comment within the paper, really.

MR. FITZGERALD: That was the first question I raised. I mean, what you're saying is these don't really count as studies. You know, that answers part of this question.

If they do count, then, you know, why aren't they sufficient to be treated as site-specific, you know, data? That's really the other part of the question.

So, does it count as a study under the way you handle the default?

DR. NETON: Yes, maybe we ought to

go back to the study and all take a look at it and describe more in detail why it's not a study.

CHAIRMAN SCHOFIELD: That's NIOSH -- going to be a NIOSH action item.

MEMBER BEACH: So, both Baker and Bruner?

DR. NETON: Yes, I mean, Bruner, you know, there's sort of a passing statement that dust particles are about 0.5.

Well, I wouldn't disagree, you know. Dust particles are by definition, a small particulate. I mean, but they're in a milieu of what?

MEMBER BEACH: Well, that goes back to what's in here as that there's chronic dust exposure. So, I think that's how that ties in.

DR. NETON: Yes.

CHAIRMAN SCHOFIELD: Yes.

DR. NETON: But then dust of what?

I mean, is it uranium dust? Is it dirt? I mean, there's a lot of different things here.

MEMBER BEACH: Yes.

MR. FITZGERALD: The particles that we're concerned with there.

MR. NELSON: So, we'll look at Baker and Bruner and we'll give you a better response.

DR. NETON: Look at it a little closer as to why they are or not all right.

CHAIRMAN SCHOFIELD: Okay. Seems like there should be in-house records of that analysis.

DR. NETON: Well, I think we've got the study. I mean --

CHAIRMAN SCHOFIELD: Right.

MR. FITZGERALD: I think the studies are captured.

DR. NETON: I think what's going to happen is they're going to reference other studies.

Do you have the SRDB number on that?

MR. FITZGERALD: You had the records section on the --

MR. STIVER: Hang on just a second. Let me pull that up.

It's here. It has the NIOSH OCAS file NP contained 1960.PDF. So, it gives a file name.

(Simultaneous speaking.)

DR. NETON: Well, I don't want to hold up the --

MR. STIVER: Yes, we don't need to do that.

CHAIRMAN SCHOFIELD: Do you have the number for Baker?

MR. NELSON: I don't have it right here. It's easy enough to get.

CHAIRMAN SCHOFIELD: That's fine.

MR. NELSON: In fact, we might cite it somewhere else.

CHAIRMAN SCHOFIELD: Okay. Then we'll go on to Number 11.

MR. FITZGERALD: That's fine. We'll move on.

MR. NELSON: Number 11 was marked in abeyance. And our action was NIOSH to verify maximum source term values reflected. And this is similar to Item Number 9 whereas we went to the PACE report and the uranium recycled report and we verified that maximum values were used in the tables. And SC&A agreed with our conclusion.

Okay, ready to move on?

CHAIRMAN SCHOFIELD: Ready to move. We're calling that one closed.

MR. NELSON: Okay, Item Number 15. This one has to do with day of sample collection for urinalysis, and we had a NIOSH action.

NIOSH need to evaluate scope and significance of issue at Paducah -- let me

make sure I say this right.

MEMBER BEACH: Implementing, is that what you --

MR. NELSON: Implications to the coworker model to the dose estimate.

Anyways, what we did is we looked at all the urine samples that were done through 1977, then 1977 through 1978, and we looked at what day of the week were those urines done. Because the focus was that, you know, they were done on Monday morning sampling.

And the distribution that we came up with is that Sunday two percent of the urines were done, Monday 30 percent were done, Tuesday 18 percent were done, and Wednesday 26 percent, Thursday 13 percent, Friday 11 percent and Saturday one percent.

So, SC&A came back and said that we still have questions. They're not clear how a 30 percent fraction on Mondays with 44

percent the following two days, does not represent a significant increase in sampling frequency in the context of this issue.

While it's acknowledged that this issue resolves itself for individual dose reconstructions, it is less clear how it resolved this in the coworker model.

And they go on to say we agree this is a common issue, but how does it resolve for other sites such as Y-12?

MR. FITZGERALD: Yes, I think, you know, this is not an issue specific to the gaseous diffusion plants. I remember it coming up at the Y-12 as well that, you know, this whole notion of taking samples after a weekend.

But I guess the table is helpful, but it sort of leaves me still a little question of whether or not you're actually seeing what we were talking about, a fairly high number of --

DR. NETON: Well, Tom LaBone I think can talk a little more about this, but we've looked at this in some detail because you're right. This affects several sites, Y-12 and most recently Santa Susana, where there were Monday morning samples.

You have to look in the context of how we model. And this would only really affect the chronic exposure coworker model.

The idea is if someone is - works five days and leaves a sample on Monday, they've been off work for two days. So, they had time to clear.

And then if a person only left Monday morning samples and they were off those two days, then some correction would be needed and affect is of course most severe or the more soluble material like that.

But the reality is that we've done some analyses on this that, if it's anything other than a Monday morning sample, the

opposite would happen. For Tuesday through Friday samples, the model actually overpredicts what they would have been exposed to.

So, when you start putting those all in the mix -- because what we do is we assume a seven-day-a-week chronic exposure. And what happens, you sort of catch up after that on Monday.

If you leave a Tuesday sample, it's the exact opposite and it only really affects on that Monday morning.

So, if you take the whole mixture into place, on balance, the model is not underreporting what these intakes are.

Tom, I don't know if you want to correct anything I said there or fill it in or state a little --

MR. LaBONE: No, that's correct. It's just that it sort of averages it out if you have the samples spread throughout the

week, is basically what it does.

MR. FITZGERALD: So, this distribution would tend to validate what you're saying because you actually do have 44 percent as I indicated in our response on Tuesday and Wednesday, and 30 percent, a third almost, on Monday.

DR. NETON: Well, for anything except a Monday sample, the model is claimant-favorable. It would be claimant-favorable using those values.

MR. FITZGERALD: So, I guess if -- well, just to close this thing out, if your distribution happened to show 50 percent on a Monday and a lot less on the rest of the week, then you might say that maybe the distribution is skewed a little bit.

I mean, in this case you have 30 followed by 44 percent on Tuesday and Wednesday. So, I think that distribution would tend to offset --

DR. NETON: It is true it's a case-by-case analysis. But I think even with Santa Susana where almost all the samples were left on Monday, our models still ended up being --

MR. FITZGERALD: Really?

DR. NETON: -- okay, yes.

DR. MAURO: Jim, this is John.

We did address this once before, and the only thing that came up was those samples that were collected on Tuesday and Wednesday and Thursday, were they after two days of a person being off?

In other words, sometimes the -- sometimes the sample is taken after the two-day hiatus. But you're saying that, no, when they're taken on Tuesday, the guy worked on Monday. When it's taken on Wednesday, no, the guy worked on Monday and Tuesday.

DR. NETON: Right.

DR. MAURO: Oh, okay. I just wanted to confirm that because there was some

discussion regarding that when this last came up.

DR. NETON: Yes, I don't know -- well, this analysis would assume then of course, then, with working a regular five-day Monday-through-Friday workweek.

DR. MAURO: Right. And if that being the case, I think your arguments are compelling.

DR. NETON: Right. I really strongly suspect that it's true. I don't know that everybody worked what I call these swing shifts that much way back when.

In other words, you would have a lot -- you'd have a variety of shifts working various workweeks. It just doesn't seem to me to be a reasonable thing.

Although, I suppose we can go back and verify that somehow.

MR. STIVER: Jim, as just kind of a practical Site Profile issue, how much of an

under-representation does the model predict for Monday morning?

It seems like it's something that could be adjusted.

DR. NETON: Oh, it could be.

MR. STIVER: Yes.

DR. NETON: I mean, if it was a Monday morning sample and it's Type F, fast clearance, it could be a factor of two or three different.

MR. STIVER: Factor of two or three.

DR. NETON: Right. But as soon as you start taking Tuesday morning samples, your model is over-predictive by 20 percent, at least in the last analysis I saw.

DR. MAURO And, Jim, if you recall, Joyce did a similar work-up and you all came to the same conclusion.

DR. NETON: Right.

DR. MAURO: So, I mean, I think

we're all on the same page. It just has to do with this matter of this sliding weekend, so to speak.

DR. NETON: So our opinion, unless all the samples are taken on Monday, which a correction could be made -- could be made --

MR. STIVER: It sounds like we have a technique in place to --

MR. FITZGERALD: Well, it's the coworker. Chronic coworker. So, you know, it takes care of itself then.

DR. NETON: We've got this seven-day-a-week, you know, exposure model. That sort of masks some of these different --

DR. MAURO: Yes.

DR. NETON: Because you're having the person exposed --

MR. STIVER: Yes, we're talking the coworker model only here anyway.

DR. NETON: Yes, and this is only applied to people, by the way, who have no

monitoring data.

MR. STIVER: Right.

DR. NETON: We would use their actual monitoring data as it was.

MR. FITZGERALD: Well, I think that response would be satisfactory. When the table came out, I thought it just basically validated what we were saying. It looked like a third were on Monday, and that's what we were concerned about.

But you --

MEMBER BEACH: Right.

MR. FITZGERALD: So, I guess I would recommend closure based on that --

CHAIRMAN SCHOFIELD: You'd call that one closed?

MR. FITZGERALD: On that assessment, yes.

MR. NELSON: Okay. Next item is Number 16. This one is marked as in abeyance. And we were given -- actually, SC&A was given

the task, but we did the same thing, is to compare the PACE 2001 incident list with Table 5-8 in the TBD listing.

And NIOSH did compare the incident list in the TBD, the Table 5-8 with PACE Page 31. It says Page 51 to 52. It's actually PDF Pages 66 through 69 on PACE.

And our response also says Bechtel Jacobs Pages 5 and 7. That's PDF Pages 12 and 14, if there's any confusion there. And we found that they were agreeable.

And we also went on to say that when we update the TBD, we'll make a note to Table 5-8 to say that additional information may be found in the PACE report in the Bechtel Jacobs report, and provide those references in the TBD.

SC&A went on to say they agree, but thought this should be discussed in the Work Group at the next meeting. Otherwise, they would recommend closure.

MR. FITZGERALD: Yes, I mean, we went and compared the charts and they looked like they were similar. So, maybe there isn't much discussion.

I think it's comparable. I think the key thing was to make sure that the reference lists are added in.

MR. NELSON: Yes.

MR. FITZGERALD: I think that was the real emphasis on that.

MR. NELSON: Yes, and we have a schedule right now for updating the TBDs. In fact, the TBD owners are getting started with this. As we come to some agreements here, they are updating the TBDs to better represent themselves. So, that's in progress.

CHAIRMAN SCHOFIELD: I think we'll call that one closed then.

Number 17.

MR. NELSON: Okay. Number 17 is marked in abeyance. Our action was NIOSH to

provide reference for evaluating job title and worker category and coworker application.

And the issue here was in the coworker model, workers are not classified by the jobs or by buildings that -- where they performed their work and no validation is provided as there could be a low probability that an unmonitored worker could have a higher exposure than the monitored workers taken as a group.

We went on to have some discussion about OTIB-14. What OTIB-14 is for, is an environmental TBD TIB. And I think SC&A was actually correct in saying they disagree that OTIB-14 satisfies the need for site-specific information regarding job categories or buildings where workers perform work.

They agree that it's good for environmental dose. But for workplace dose, it wouldn't really cover that. And I have to agree with that.

So, we'd like to -- OTIB-60, that's the internal dose reconstruction TIB. And we can update the TBD to show how we can apply coworker to individuals where they perform their work. Not necessarily environmental, but those that were workplace doses.

MR. FITZGERALD: Yes, I think that, you know, we went and looked at TIB-14, and that's kind of where we came out.

MR. NELSON: I just think we didn't give you a great reference. A better reference would have been OTIB-60.

DR. NETON: Well, I've used this OTIB-14 in the past, though, as evidence of how we would go about picking people with some exposure.

I mean, I agree it's an environmental TIB, but, you know, it clearly says, you know, there's one -- the top group -- I'm remembering it now -- says almost no

exposure. I think you're talking about administrative-type people who worked in clean areas and never frequented the plant. That's kind of a no-brainer.

Then in the middle categories, people with some potential for exposure. And I think clearly that middle category, in my opinion, would relate to not environmental exposure, but would get 50th percentile of the internal dose model.

Then there's an upper category which is people that definitely have potential for exposure that could have had significant exposures. And I think it's in -- I'm not sure in this particular case, those who get the 95th percentile. You're talking about people like chemical operators, you know, people working in very contaminated areas and doing things that have potential grinding, cutting, welding operations.

That's sort of the way the triage

works. I don't disagree with Chuck that we probably need to have a better example put in the internal TIB. I think that would strengthen our argument.

But I think TIB-14 does sort of lay out the - sort of the triage approach as to who gets what dose even though it is an environmental TIB.

MR. NELSON: I think it would strengthen if we put in OTIB-60 as well.

DR. NETON: Yes. And we have to keep in mind these are examples. I mean, I brought this up to the Board I think a meeting or two ago, and I immediately got some grouching going on.

Well, you know, the clerks over in this plant always went in the area where, you know, very heavily exposed and I acknowledge, you know, these are general guidelines, but you've got to have site-specific, you know, evaluations done.

But otherwise, I don't know how you start. And of course we're always going to err on the side -- try to err always on the side of the claimant-favorable if we can.

MR. FITZGERALD: Yes, and I don't disagree. I think what, you know, OTIB-14 is a starting point. It's a general description. And I think if you want to go one level down that's more specific to the site, that would point you in the right direction. And that's all we're saying here.

DR. NETON: Yes, I think a better documentation essentially sort of put in writing what we're actually doing, how we're triaging these cases is a good idea. I don't disagree with that.

MEMBER BEACH: So, where does OTIB-31 come into it? SC&A talked about OTIB-31 in -- Table 2 serves to illustrate the most highly exposed, because what I'm hearing so far is 14 and 60.

CHAIRMAN SCHOFIELD: Yes.

(Simultaneous speaking.)

MR. FITZGERALD: 31 is -- I think that is probably in the wrong place. It has to do with whether the most exposed individual is badged.

MEMBER BEACH: Okay. So, that shouldn't be there?

MR. FITZGERALD: That might just be misplaced.

MEMBER BEACH: I was just wondering about that.

(Simultaneous speaking.)

MR. STIVER: Yes, I think that came out in the last meeting.

MEMBER BEACH: Okay.

MR. NELSON: I think if you went to the SC&A, the entire three-page comments, then there was some discussion about external. I think they were closing the loop on that.

MEMBER BEACH: Okay.

MR. NELSON: That kind of threw me off at first.

CHAIRMAN SCHOFIELD: Just strike 31 then?

MR. FITZGERALD: No, no, no. I think he's right. There's been so many cites in this.

That was a very lengthy finding in the Site Profile Review and it did get into the question of addressing external exposures, but that was meant to close that loop on that particular item.

DR. NETON: Yes, TIB-31 is the external coworker model.

MEMBER BEACH: Right.

MR. NELSON: Right.

MR. FITZGERALD: So, the internal coworker, external coworker. So, the context though is what points the dose reconstructor in the right direction as applying the coworker model.

And we're saying the job categories if one could be a little bit more specific, site-specific, that would be more meaningful as a guide.

So, we've held that in abeyance and, you know, I think with further feedback from the Work Group, that would be -- I think it's both methods as Jim is pointing out, as well as maybe a little more explicitness about the job categories with the site.

I think illustrative examples are a starting point, but not -- it would be helpful to have one layer down.

CHAIRMAN SCHOFIELD: So, maybe just a better description of job categories.

MR. FITZGERALD: Well, it's both how you would apply and --

CHAIRMAN SCHOFIELD: Right, how you apply it and --

MR. FITZGERALD: I think the point here is you're not going to be so precise that

you're going to have every job category and all that.

CHAIRMAN SCHOFIELD: Right. In generality.

MR. FITZGERALD: But for a site-specific approach, you might have more specificity for Paducah that would be more helpful for the dose reconstructor to apply in the coworker model.

MEMBER BEACH: 20 is listed in abeyance, but I have it down as closed after our last meeting.

MR. NELSON: Well, I think we got a good response for that one.

MEMBER BEACH: Yes.

MR. NELSON: I think SC&A was happy with that.

MR. FITZGERALD: Yes, we're fine.

MR. NELSON: Do we need to discuss it in detail?

Basically, the question was about

coworker -- how do you apply coworker to -- or external coworker dose to the individuals. And we made reference to OTIB-20 in -- where it talks about evaluating job title, worker category, select the proper coworker percentile value, be it 50th or 95th percentile. And OTIB-31, that's the coworker TIB.

So, we're going to add a reference to OTIB-20 to the external coworker TIB. And SC&A was okay with that.

And there was another issue about the data trend, you know, what about prior to 1960. And we had some discussion there and provided a table that showed that, you know, the most highly exposed workers were indeed monitored prior to 1960.

So, we think our coworker model holds. And SC&A agreed with that and recommended closing.

CHAIRMAN SCHOFIELD: Closed.

MR. FITZGERALD: Yes.

CHAIRMAN SCHOFIELD: Okay.

MR. NELSON: Okay. Item 22 was regarding x-rays. And there was a long response for that, but it was using site-specific technique factors and conservative air kerma values for applying those Paducah TBD from OTIB-6.

And one thing that we're doing, actually OTIB-6 has been revised. And OTIB-6 will be directly referenced in the Paducah medical TBD.

And it also has revisions on and more detail how we apply substitute DCS for certain organs.

That was some of the discussion that was brought up. And SC&A was in agreement with our response.

MR. FITZGERALD: With this discussion, I mean, it's a good discussion. Is this going to be added? I think you were

saying --

MR. NELSON: Well, we're going to make -- I mean, the tables that we have in the TBD for assigning medical x-ray dose, they are -- for Paducah, they are accurate.

We use substitute DCS, but OTIB-6 didn't do a very good discussion on discussing assigned substitute DCS. So, it has been revised. It now has a nice discussion of that.

I don't know if Elyse is on the phone or not to discussing of that, but -- Elyse Thomas? Is she out there?

MS. THOMAS: Yes, hi, Chuck. This is Elyse Thomas with the ORAU team. And I think the response is pretty clear.

The comment had to do with the dose impacts of less than optimal use of technology. In other words, if they used screens or film that weren't as, you know, the fastest that were available.

But the point of the response was that, since we used site-specific technique factors, those technique factors would have accommodated the level of the technology that they were using. And so, it becomes kind of a moot point.

So, in other words, even if they weren't using suboptimal technology, because we are using site-specific technique factors to develop the entrance kerma values, we have included that in our dose estimates.

So, I hope that helps explain our response to SC&A's comment.

MR. FITZGERALD: I think we're fine. Even the opportunity to provide a little bit more background, a few sentences, that might even be helpful.

MS. THOMAS: Yes, we'd be happy to do that when we revise, you know, this TBD.

MR. FITZGERALD: I'd recommend closure on that.

CHAIRMAN SCHOFIELD: Okay.

MR. NELSON: Yes, these are secondary issues.

DR. NETON: That's why they have an S next to it. That's what the S stands for.

MR. NELSON: 23s, okay. That's the next one. It says NIOSH will follow up. This was the provided equations for estimating 24-hour excretion on the basis of spot urine sample was incorrectly written.

We agree that it was, but we never used the equation and it was deleted from the TBD, and is not the current version. So, I'm not quite sure -- you may ask for a commitment to delete or change this equation, but we no longer even have that equation in the TBD.

So, I don't know that there's any issues here.

CHAIRMAN SCHOFIELD: Probably Number 23, I think. There's not a real issue.

MR. NELSON: SC&A agree?

MR. FITZGERALD: Yes.

MR. NELSON: All right. Probably the next one that's going to have some discussion on it.

Okay. 24s, use of unverified bioassay data. The database for internal dose data 1952 to '56, was not verified by DOE for completeness and accuracy. It's not clear if NIOSH has done so.

And our action was to verify the pedigree or database and determine -- or database, and determine if it's been verified and validated.

Basically, there is a database from 1952 to 1976. And when we had gotten it over to us, it said unverified. But what it is, it's a listing of all the urinalysis for that period of time. So, that's tens of thousands of records.

And we understand it hasn't been through a V&V through DOE, but we took it as a

record from DOE and used the data to develop coworker data.

Here's our understanding. In 1991 and 1993, a HIT was made by Paducah health physics dosimetry to make electronic files of in vivo records and the urine cards.

In 1993 in July of that year, they no longer contracted. That company was LMUS. And so, we don't think a complete validation was done of those -- of that access database. We don't know that it's been through a V&V process.

So, the question comes down to how big of an undertaking would we want to do from our standpoint to verify that this database is accurate?

We have the individual records. In their files, it shows all the urine cards. This would be for a coworker issue.

So, you get all this coworker data that was based on this data that was not

necessarily verified.

So the question is, is what do we need to do? I think Jim was going to --

DR. NETON: Yes, I think there's no question we need to do something here. I mean, we can't accept -- it's been our routine method to do some type of validation on these databases. It even says so somewhere in one of our procedures, I think.

MEMBER ANDERSON: How would you do it?

DR. NETON: Well, you know, I can think of what we've done in the past, and there's a couple things we can do.

One is we can spot check and verify that the data that we do have from hard copy records in the claimant files matches on a sampling-level basis.

It's something that we've done at other places. And Mark Griffon was a big proponent of this, was to go find -- a lot of

times you'll find these summary health physics reports. It will say in 1995, we took 4,000 urine samples and blah, blah, blah and this many and just go and say, okay, do we have -- they took 4,000 samples; let's make sure we have 4,000 samples, you know, so we feel like we've got the right volume. We're not missing something.

And I think if we do those two things, we can do those two things, it will at least give us some sense that we have a complete data set and, you know, we don't have claimant data that's not showing up in that database as well looking at the original data. And that would be a sampling effort as well.

It would, you know, nothing is perfect, but I think that would go a long way to at least give folks some comfort that we at least feel like we've got the complete --

MR. STIVER: Sounds like identical to what you guys did for the Fernald -

DR. NETON: Yes, it was similar.

MR. STIVER: So, you've definitely been down that road before.

DR. NETON: Yes, this would be a sampling effort. We can't do it all, but we can spot check the cards against -- the claimants against the database, and also to somehow validate that the numbers we have make sense in light of what we knew they were doing.

And usually in a place like Paducah, there's got to be reports that say the health physics program took 5,000 samples this year or 2,000 urine and, you know, look at that.

MR. FITZGERALD: Yes, I just, you know, I think that would help because I think I'd be concerned that the vendor didn't care about money.

And we might have half of them or half the samples were recorded or something

like that, and I think a macro approach would at least validate that much.

CHAIRMAN SCHOFIELD: I would assume that those records and nothing else, the DOE should have them whether they're from AEC, ERDA.

MR. FITZGERALD: Yes, well --

MR. NELSON: What it was is somebody went through all these tens -- hundreds of thousands of urine cards and they entered them into this electronic database.

So, they didn't complete the task of verifying that they got them all. So, when they sent the database over to us, they put this little thing that said, unverified. Which thanks to --

(Simultaneous speaking.)

MEMBER ANDERSON: Best we could do. Good luck.

MR. NELSON: So, they spent two years on it and didn't complete it.

DR. NETON: We'll do an effort, basically try to do what I just described.

CHAIRMAN SCHOFIELD: Okay. So, you're going to go back in and look at it and then do the sampling.

DR. NETON: Yes, sampling strategy. Nothing --

CHAIRMAN SCHOFIELD: Okay.

DR. NETON: Nothing extensive -- I mean, it will be extensive, but not --

(Simultaneous speaking.)

CHAIRMAN SCHOFIELD: Okay. How about 25s?

MR. NELSON: Okay. 25s was -- the issue was incorrect selection of distinct time period.

What it was is we -- this is the coworker TIB for internal. And we assigned dose for two distinct periods. And SC&A said, well, we think there's three distinct periods.

And we took their periods and kind

looked at them closely and basically said their first and second period, which is our first period, we don't feel there's a big difference between the two and threw some statistic numbers behind them. And SC&A agreed with us that there was little difference between those two periods, and recommended closure.

CHAIRMAN SCHOFIELD: You haven't changed your mind, have you?

MR. FITZGERALD: No. I mean, I think that was the question whether there was any real distinction there. There's nothing to add to the question.

MEMBER BEACH: So, that means we're done with Paducah.

So, is anybody ready for a quick break?

CHAIRMAN SCHOFIELD: I think so.

MEMBER BEACH: All right. So, those of you on the phone, we're going to go

ahead and take a ten-minute break. I'm going to put the phone on hold, and we'll be back at 10:42 or shortly thereafter.

(Whereupon, the above-entitled matter went off the record at 10:32 a.m. and resumed at 10:44 a.m.)

MEMBER BEACH: Okay. We're back online.

Ted, do we have you back?

MR. KATZ: Yes. Yes, we do.

Are we moving on to Portsmouth then?

MEMBER BEACH: Yes.

CHAIRMAN SCHOFIELD: Okay.

MR. NELSON: All right. The Portsmouth, these comments were sent to SC&A. And they made response to them on April 22nd, 2011.

And NIOSH came back on the 14th of June and provided a response based on SC&A's response.

So, what you'll see if you're looking at these set of -- this matrix -- I went ahead and passed them out at the meeting here. The red line versions are the track changes.

So, you'll see the changes that we made to our response based on SC&A's response. So, at this point they're at -- SC&A has them. We've given our latest and greatest response.

MR. FITZGERALD: Yes, what's on the bottom is that we submitted our response April 22nd. And we got a markup, basically, on June 14th. So, this has been moving fairly quickly.

On this issue of technetium-99, this is just I think more of a factual accuracy issue. I mean, there's no disagreement that there's an error in one of the tables and I think this certainly addresses it.

My only question would be in the meantime, I think the comments made that, you know, the dose reconstructor wouldn't be using these values, you say are typically not used.

Hopefully, not used at all because it's a pretty big error, I guess several orders of magnitude.

Is that the case? I mean, maybe we can ask the dose reconstructors. You know, it's not being used, the actual value itself, right?

MS. ALGUTIFAN: This is Elizabeth Algutifan.

No, we don't use that table.

MR. FITZGERALD: Okay. Just wanted to put a punctuation point on that.

So really, by making the correction on the table next edition, that should take care of it then.

MR. NELSON: The one that we do make is that regarding recycled uranium

contaminants, we're actually reviewing that at this time. And we're going to be revising -- or possibly revising some of these tables if we find out that the values that we have aren't claimant-favorable or if they need to be revised for some reason.

So, recycled uranium at Portsmouth is being reviewed.

MR. FITZGERALD: Which is sort of a broader arena.

MR. NELSON: Yes.

MR. FITZGERALD: I mean, this would fall into --

MR. NELSON: Correct.

MR. FITZGERALD: Right.

MR. NELSON: That's just one of the recycled uranium contaminants, tech-99.

MR. FITZGERALD: So, I would recommend closure based on the fact it's not being used in dose reconstruction and there's going to be a revision made in the next

edition.

CHAIRMAN SCHOFIELD: With the caveat that they'll take a look at it.

MR. NELSON: Do you want to go on, Joe?

MR. FITZGERALD: Yes. I guess we're on Three, which is where we had -- I'm trying to read this thing here.

This has to do with recycled uranium contaminants as well. And I think your response is the same as it was on the previous one that, you know, you're going through and actually reviewing this.

And, you know, our comment before that was that we felt there would need to be more -- something more specific in terms of response to the recycled uranium issue.

And I think what they're saying is they are going through and doing something very specific on that issue. So, I'd keep it in abeyance and just wait for the recycled

uranium review.

What shape is that going to take relative to -- I know you've looked at it for Fernald. How's that going -- what shape is that going to take as far as the gaseous diffusion plants?

Is that going to be some standard language that's going to go in all three or --

MR. NELSON: I'm not sure yet. I mean, we're just in the early stages. Finally have some resources to dedicate to it. So, I don't think we know yet.

Bryce Rich is out there. Bryce, do you have any comment on that yet?

MR. RICH: Nothing more than you have indicated, Chuck. Thank you.

MR. NELSON: Okay.

MR. FITZGERALD: All right. Well, I think we can just keep it in abeyance and wait for the response.

That brings us to Number 4. And I

think this has to do with the gross alpha urinalysis results. And our question was the need for more information, are gross alpha bioassay results adequate for dose reconstruction such that they can substitute for the application of generic default value at 3.5 percent?

And I think the explanation is fine. I think I've actually heard this one before, but I think it's useful to revisit this occasionally because I always, you know, I think that at face value, I had a problem. But then I read the explanation and then it always goes away on gross alpha.

The response, gross alpha urinalysis results eliminate the need to know actual enrichment of the uranium and is calculated from activity rather than mass. So, I think we're fine, with that reminder.

CHAIRMAN SCHOFIELD: That one is closed.

MR. FITZGERALD: And the last one, Number 5, was, you know -- well, we weren't being flip. We just wanted to make sure it was clear that there was actually a change that was being committed to. And I think that was clarified and we're fine with that.

So, Number 6 is -- I'm trying to follow your response to our response. This had to do with the in vivo rad monitoring lab chest counts for detecting uranium and the question of limitations, uncertainties with that process.

And I think, Chuck, your response on this one was that you were going to add the background on how the whole body counting was done.

MR. NELSON: Yes, we were going to basically put in there the limitations --

MR. FITZGERALD: Yes.

MR. NELSON: -- of use of the whole body -- of a chest count. But by the

same note, there's no cases in which we use only the chest counts by themselves.

But we would talk about U-238 and, you know, it's limited detection for that. And as well as the transuranics and so forth.

MR. FITZGERALD: And so, yes, the question that we had, you would respond in the affirmative, will NIOSH revise current wording in the TBD to indicate that only the U-235 data from the whole body counting, the MIVRML, should be relied upon?

I mean, is that --

MR. NELSON: Yes.

MR. FITZGERALD: Okay.

MR. NELSON: We'll update the TBD to clarify that.

MR. FITZGERALD: Okay.

DR. NETON: Are we going to look at the 235? I mean, if there was a big bird at 238, you could see it.

MR. NELSON: Well, we say that

we're just going to clarify in the TBD that -- let me find out where the response is here.

We're just going to note that the MDA is quite large.

DR. NETON: Right.

MR. NELSON: And just say that there are some limitations to it. And it's of a limited usefulness, but it can be used.

DR. NETON: For an enrichment plant, I guess that's true. I mean, in places like, you know, natural uranium facilities where you've got U two thirty -- it's 5.2 millirems was the detection limit of the system, I recall. About 5.2 millirems of natural uranium.

But if you have an enriched uranium, you're right. 235 is the correct way to go.

I think this in vivo system is really just sort of a piece of the puzzle. It's sort of confirmatory that, you know, your

bioassay results aren't consistent with your in vivo, and vice versa.

You just want to make sure you got a complete -- if you got the data, you've got to compare them to make sure you got a good copy.

MR. NELSON: I think SC&A's point was there is limitations, and we say we'll make note of those limitations.

MR. STIVER: We'll identify them in the TBD.

DR. NETON: This thing had like an 11 -- an 11 by four inch sodium iodide detector. It was a big --

MR. FITZGERALD: Well, I think we'd be fine. I think it was just a question of adding those qualifying statements, and I think these are fine.

So moving on to Seven, that was again just trying to be very clear that the revision was --

MEMBER BEACH: So, before we go to Seven, did we abeyance Six or close Six?

MR. FITZGERALD: No, Six could be closed.

CHAIRMAN SCHOFIELD: Six is closed.

MEMBER BEACH: Okay. Just wanted to --

CHAIRMAN SCHOFIELD: With that caveat that they're going to make that notation.

MEMBER BEACH: Thank you. Sorry for --

MR. NELSON: So, if you look at our changes, I think I went through there and green-highlighted this, which might be confusing.

I think those were my notes and -- well, you didn't get those. Okay.

MR. FITZGERALD: This language that you provided, I think, is the language we were looking for as far as the qualifying

statements.

MR. NELSON: Okay.

(Simultaneous speaking.)

MR. FITZGERALD: On Seven, again, we were just looking for an affirmation which I think --

MR. NELSON: Well, I think I'll chime in on Seven here, because we start looking closer at the LOD --

MR. FITZGERALD: Okay.

MR. NELSON: -- for the two-element film badge. And I think we were going to have to raise the -- it's listed as 30 millirem as an LOD. And I guess it's the Hanford two-element film badge.

And the film badges that we use later, the four-element with the security credential, Matt Smith looked into that some. And I don't know if he wants to add any notes, but we think we were going to have to increase the LOD for that. So, we don't want

to close that issue yet.

MR. FITZGERALD: Okay, yes. There's two parts on this. One is the technical support information.

MR. NELSON: Right.

MR. FITZGERALD: And the other is the question of claimant-favorability.

MR. NELSON: Right. There was a table in there and it said we used the two-element film from beginning until I think it was 1980.

Well, it ended up in July 1960, they went with this combination security dosimeter which was four-element, and we didn't put that distinction in the TBD in that table.

So, we want to add the verbiage to say, you know, this is when it came into affect.

But in looking at it closer, like you said, the other part of the issue was the

LOD of 30 that we had in there. And we think -- we know that we're going to have to raise that. So, there's going to need to be a change.

CHAIRMAN SCHOFIELD: At what point in time are you going to go with the 40?

MR. NELSON: Matt, do you want to speak to that?

MR. SMITH: Probably for that whole early year. If you -- when we look at OTIB-17, Hanford is running with a 50 millirem LOD for that entire early period with that element dosimeter. That continues onward a little bit, too, until they get into multi-element.

So, it's still something we're looking at. It looks to be around 40 right now, but still kind of going through some of those SRDB documents.

CHAIRMAN SCHOFIELD: So, you're looking for a date.

MR. NELSON: No.

MR. SMITH: And the credentials provide some -- there's some material there in front of the actual element that's -- that we've got to consider.

MR. NELSON: So, that's something we're working on right now. And we're pretty sure there will be a change to the TBD and it will affect some cases. So, that item is still open.

MR. FITZGERALD: You have that, Phil?

CHAIRMAN SCHOFIELD: Yes, I think we're ready to go with that.

MR. FITZGERALD: Okay. So, that would we be in abeyance.

CHAIRMAN SCHOFIELD: Yes.

MR. FITZGERALD: Number 8, this is part of what we got into early on, which was the shallow dose -- coworker shallow dose and some of the concerns over the, you know, the -- whether or not the Table 8-2 reflected the

coworker doses that were received, and whether or not the number of zeroes was actually an indication of a problem.

And I think your response was that -- well, certainly your response to technetium wasn't an issue, but we went through that already.

And on shallow dose, can you go through that a bit one more time?

MR. NELSON: I'll let Matt do it.

Matt, will you mind going over the shallow dose LOD issue or the missed-dose issue and how the null values from the traction make it appear that you don't have any shallow dose?

MR. SMITH: Sure. There's a subtraction routine going on with respect to how the site's processing the data. So, it is called out in the coworker OTIB why those null values do appear.

The other thing to consider is

what we go ahead and do then is add in missed dose.

So, even though you've got null values apparently there, we're adding in a component of missed dose, which essentially makes it a pretty claimant-favorable approach.

MR. NELSON: Yes, if you go to OTIB-40 and you look at step -- on Page 8 of 10, Step 4, then the bottom of the page on Step 5, it discusses these null values and why you would get zeroes for those non-penetrating doses.

Because essentially, you're assigning that dose that's penetrating and it's actually for a 30 to 250 keV photons. It's more claimant -- favorable to the claimant to assign them as 30 to 250 keV photons, rather than greater than 15 keV electrons.

So, even though it appears that there's no shallow dose or no beta dose

assigned, it actually is rolled into the deep dose.

And there's a pretty good explanation on OTIB-40. Although, I must admit it is somewhat confusing.

MR. FITZGERALD: And OTIB-40, when was that issued?

MR. NELSON: 7/29/05.

MR. FITZGERALD: Okay. So, that definitely was accompanying the Site Profile.

MR. NELSON: Right.

I mean, the confusion is if you look on Table 8-2 for the non-penetrating doses, they look pretty low.

But those values are incorporated into the 95th -- or into the gamma dose, be it it the 50th or the 95th percentile.

MR. FITZGERALD: I think that's where some of the confusion was.

MR. NELSON: Right.

MR. FITZGERALD: So, you're saying

the dose to the skin is entered into IREP as 30-250 keV photons.

MR. NELSON: Right. Where you see those zero values, they're actually incorporated into the gamma component.

MR. STIVER: But you assign a missed dose at that energy level which --

MR. NELSON: Right.

MR. STIVER: -- it ends up being claimant-favorable.

MR. NELSON: Right.

MR. STIVER: Okay.

MR. FITZGERALD: So, I think that that's responsive. It wasn't clear, I think, in the beginning.

So, I would recommend closure based on that.

CHAIRMAN SCHOFIELD: Okay.

MR. FITZGERALD: Now, the first part on technetium obviously has a different issue.

Nine, I think we agreed with that one except where -- with the exception on the skin dose discussion we had earlier, I think.

We're indicating it's a broader issue than just Portsmouth. Obviously, it applies.

I think whatever, as I recall, the commitment to go back and just take a look at that more specifically would be -- so, I would hold that in abeyance and just wait for the response on the skin issue.

MR. NELSON: Tech-99 for both Number 8 and Number 9?

MR. FITZGERALD: Well, yes. I mean, it's sort of -- it finds its way into Eight a little bit. It's certainly in Nine, yes. So, it would be Eight and Nine would have -- that component on skin would be held in abeyance.

MR. NELSON: For technetium only, correct?

MR. FITZGERALD: Using technetium, yes. I can't think of anything else that is as common as technetium at the gaseous diffusion plants.

So, that would be Eight and Nine on that issue --

MR. NELSON: Yes.

MR. FITZGERALD: -- that will be held in abeyance.

Ten on neutron, the slow cooker.

(Simultaneous speaking.)

MEMBER ANDERSON: Change that.

MR. FITZGERALD: I actually went back to the NIOSH health evaluation that was done to take a look at where the slow cooker, you know, this is one where it's difficult to pin down exactly what the heck you're dealing with as a source term.

I mean, the problem is the phenomena probably existed, but there's no way of knowing to what extent the accumulation was

such that you would have, you know, a significant neutron exposure.

So on one hand, yes, it probably happened and there might have been some neutron exposure. On the other hand, I don't think there's any way to figure out, you know, where the source term would have provided an exposure.

So, it's a very non-quantitative issue based on looking at the -- looking at the evaluation.

I wanted to go back to the source document. I hadn't looked at that in a long time.

I went back and looked at it and I guess our conclusion is that, even though it's a point, it's not one that can be addressed from a dose reconstruction standpoint given the information.

Even, I think, the hazard evaluation sort of pointed out that, you know,

a maybe type of thing.

So, I guess we would back off and say that, you know, is it something that could be quantitatively addressed in dose reconstruction, and just close it.

DR. NETON: I was ready for a nice rousing discussion.

MEMBER ANDERSON: What's the impact?

MR. FITZGERALD: Well, I mean, the impact is --

MEMBER ANDERSON: I mean, it's easy to do because we can't --

MR. FITZGERALD: Well, in the cascade process, you would have -- okay. The cascade process, you have this opportunity for accumulation of uranium to the point where you would get some subcritical release of neutrons and the fields might end up -- might end up being more significant not if you had enough.

But no measurements, apparently,

were taken to benchmark how much and where and when. So it's one of these, you know, sort of an acknowledgment of phenomena that likely existed but nobody went in to actually figure out to what extent it was a problem and actually did any measurements. So, no, there's no data.

DR. NETON: It's purely based on conjecture.

MEMBER ANDERSON: I mean, but is it a reasonable assumption that it would have happened?

DR. NETON: We don't think that it could have happened for any sustained period of time. For it to go be subcritical for that many years and never have a criticality event seems to us to be implausible.

You know, once you get into enough neutrons there for it to just sort of sit there and yo-yo without ever going critical, it would have to have some very unique

situations.

MEMBER ANDERSON: You wouldn't have noticed it.

DR. NETON: And, in fact, I don't think enough material actually accumulated in these traps to get this sort of critical mass that's needed based on even their SAR calculations, I don't think.

MR. FITZGERALD: This is the only place, I mean, you know, having done the Tiger Team at Portsmouth, you know, this would have kind of surfaced at some point.

But this came from a -- certainly, union representatives at Portsmouth in the '90s were concerned about neutron exposures and went to NIOSH and, you know, requested an evaluation.

This was the evaluation that was done by characterizing the neutron exposures and this is where it surfaces. And I haven't really seen it anywhere else.

But it was identified as more of a phenomena that could take place, but not one that in fact did take place and verified with data.

So, after going back in and trying to reconcile the comment that was in the original Site Profile Review, and I didn't do that review, with, you know, with what was in the NIOSH health evaluation that was done in '96 or something -- '97, it just seemed more subjective.

So, you know, I think you have situations where you don't have any basis for --

MEMBER ANDERSON: I mean, that's helpful. You know, we need it not just to say, well, we can't do it. And, therefore, it's -- you'll ignore it.

I mean, I think it sounds reasonable that --

MR. FITZGERALD: Actually, I would

encourage --

MEMBER ANDERSON: I mean, it's a hypothetical.

MR. FITZGERALD: I encourage anyone on the Work Group to take a look at that health evaluation. It's actually on the internet and you can Google it up and read it, because it's useful to get it in context, you know.

DR. NETON: No one's ever measured these before. I mean, and no one's really talked about them other than the NIOSH evaluation. And they actually did some dosimetry and failed to see anything.

Well, they caution the reader in their own report, though, this is a very brief study and who knows, you know.

MEMBER ANDERSON: So, that's always the caveat.

DR. NETON: It's theoretically possible. But in our opinion, is it really

plausible over such a long, extended period of time? We don't think so.

CHAIRMAN SCHOFIELD: Wouldn't they have also tried to limit that possibility through the geometry of the --

DR. NETON: Oh, yes, there's all kinds of analyses.

MEMBER ANDERSON: Yes, I mean, the design would have --

CHAIRMAN SCHOFIELD: That's what I mean. The design geometry I would think would --

DR. NETON: Well, there's different uses of the term slow cooker. I mean, if you read their Safety Analysis Report when they talk about slow cooker, they talk about something that goes, you know, low criticality. It actually had some criticalities, and then backs off.

Whereas Cardarelli, who was the author of the NIOSH report, talks about a

subcritical thing where the neutrons just sort of increased a certain amount and then back off.

And for that to happen on a, like I say, a yo-yo basis like that -

MR. STIVER: You'd have to have just a really unique configuration.

DR. NETON: A very unique situation. I mean, moderate and go away, moderate. And I'm not sure how that could happen.

We also have a fairly claimant-favorable neutron/photon ratio in here. I think the balance of the plant was 0.125. And then we ended up using the values that were measured in the facility yards at 0.2 for everyone.

And so, there is some safety conservatism built into that calculation.

MR. NELSON: If you go into the Safety Analysis Report, their accident they

evaluated was a compressor. And it required about 1100 pounds of buildup in the compressor. And that provided the best geometry since it was kind of round.

And the numbers that we saw and the discussion that SC&A had was in the 30, 40, 50 pounds of buildup, you know. So, it nowhere approaches what would be a critical mass for that geometry in that type of form that the material would have been in.

MR. FITZGERALD: It's interesting because I haven't really seen that issue at least anywhere else. And I --

MEMBER ANDERSON: I mean, it's a curious --

(Simultaneous speaking.)

MR. FITZGERALD: Well, not even academic, because I think part of the concern was that it didn't really monitor neutrons.

So, you know, if you had a source that was prominent, you know, you could

definitely have a problem.

And I think everyone was conscious of facility yards and some of the storage areas, but this was sort of in the operating part of the plant.

But, again, it was somewhat speculative to --

DR. NETON: I think part of the logic was based on the fact that the criticality alarms went off periodically, and they were writing them off as false alarms.

But having been responsible for the maintenance of a criticality monitoring program at another facility, I can tell you those things are very sensitive to fluctuating gamma background.

You set your gamma detectors at a very low level. Then a truck drives by the plant with some storage material on it. Next thing you know, you've got a criticality alarm.

I mean, so there's all kinds of ways criticality alarms can go off without having criticality, because they're usually set to a fairly low threshold.

And, again, that would have been a criticality because the criticality alarms measure photons.

MEMBER ANDERSON: Yes.

DR. NETON: They don't measure in neutrons.

MEMBER ANDERSON: Yes.

DR. NETON: And Cardarelli's example was these neutrons that generated that never really went to --

MEMBER ANDERSON: Not quite.

DR. NETON: You know, so, I don't know. It's an interesting analysis, but nothing we can really do with it.

MR. FITZGERALD: Enough said on slow cooking neutrons.

MEMBER ANDERSON: I just don't want

us to get caught by somebody saying, oh, you just blew it off.

MR. FITZGERALD: I was trying to figure out if there was anything hard that sort of provided a basis, but I don't think -- there certainly wasn't in the Cardarelli report, but --

CHAIRMAN SCHOFIELD: We'll call that one closed?

MR. FITZGERALD: Yes.

CHAIRMAN SCHOFIELD: Okay.

MR. FITZGERALD: Number 11, this had to do with SC&A disagreeing with the assumption in the TBD that there were not significant environmental releases at PORTS that would advise to radiation dose rates above natural background.

Chuck, I'm just trying to follow the bouncing ball here.

MR. NELSON: Right.

MR. FITZGERALD: I think the

original response was to provide more background in terms of the environmental values that were being used, a maximizing dose of 0.452 in particular. And you explain where that's derived.

And I think we indicated more information needed. And we agreed conceptually that we -- I was -- we were looking for the 0.452 number. And I think you just in your response provide the derivation of that.

MR. NELSON: Right. It was in the -- if you go over to PROC-0060, that's occupational onsite ambient dose reconstruction for DOE sites. And it provides what the maximizing ambient dose values are for Portsmouth. And it provides the basis.

And, essentially, I know you guys had followed the value of -- what was the previous value? It was like 260-something, I think.

MR. FITZGERALD: Right.

MR. NELSON: 267. And it was just suggested for 2600 hours and an uncertainty of 1.3, and it gave you the value of .452.

So, we provided you the link with that and where we got it from.

MR. FITZGERALD: Right. That's fine. I think what we were saying there, we agree with the approach. We just couldn't find the actual number. And I think this derivation helps on that. And 60 is referenced.

CHAIRMAN SCHOFIELD: So, Number 11 is now closed?

MR. FITZGERALD: Yes.

CHAIRMAN SCHOFIELD: Number 12.

MR. FITZGERALD: Oh, this is the 267 ambient environmental dose. Yes, we agreed with that.

CHAIRMAN SCHOFIELD: 13 is closed as well?

MR. FITZGERALD: 13, let's see. 13 is closed as well. I think that was just a question of -- this had to do with the ambient environmental doses confined to deep dose that may significantly underestimate potential shallow dose in skin.

I think -- the response says, due to the nature of non-penetrating dose, it would not be expected to see elevated levels compared to the penetrating doses to areas where environmental doses apply.

And ORAUT-OTIB-17 is cited as the basis, and we agree with that.

CHAIRMAN SCHOFIELD: Okay.

MR. FITZGERALD: I think that was a clarifying question, actually, more than anything else.

CHAIRMAN SCHOFIELD: The last one. 14.

MR. FITZGERALD: 14, the time period for PFG, the photo fluorogenic

procedures on medical x-rays is restricted to 1954 to '57 despite statements in the TBD verifying extended use beyond -- well, from '54 through '60, and just a consistency issue.

MR. NELSON: Yes, it wasn't very clear in the TBD. And it says we revised it.

MR. FITZGERALD: So, it's just a matter of getting the dates consistent. And I think NIOSH is saying they'll revise it and make clearer what the dates are. And we're fine with that.

CHAIRMAN SCHOFIELD: Closed, or abeyance?

MR. FITZGERALD: Well, I would say closed with the understanding that those dates will be, you know, clarified in the later edition.

I think the last time the Work Group discussed this, there was some agreement that we would close things with the expectation that there would be follow-through

in the next revision.

MR. NELSON: Right.

CHAIRMAN SCHOFIELD: Josie, I lied. We are going to get to K-25 today. Moving right along here.

MEMBER BEACH: Must have been the holiday.

CHAIRMAN SCHOFIELD: Everybody is all happy and relaxed.

MEMBER ANDERSON: So, there's a couple of open ones on this yet.

MR. NELSON: Yes, the LOD issue, and the tech-99 issue.

MEMBER ANDERSON: Okay.

MR. NELSON: Okay. This is the one we have response from SC&A on June 16th, 2011. We sent SC&A some responses, and they came back a couple weeks ago and gave us responses to our responses. And I guess we'll start with Number 1.

It says more guidance was needed

on appropriate enrichment. It says more guidance is needed regarding appropriate enrichment to assume when interpreting uranium bioassay mass concentration and the enrichment assumed for the default isotopic distribution may not be appropriate.

And I think essentially the response here is that whenever we reconstruct doses, we use gross alpha measurements. So, we don't necessarily have to know what the -- we don't have to know the uranium enrichment at all. We just assume gross alpha.

Didn't really understand SC&A's follow-up question with that. They agreed with our response, but I didn't really understand their follow-up question.

I think if I do, the answer is simply no.

MR. FITZGERALD: Yes, I think in terms of recycle, it would be -- it wouldn't matter even if it was a higher enrichment in

recycle.

MR. NELSON: So, our response is, no, since gross alpha is used when reconstructing the internal dose.

And we can put those instructions in the next revision of the internal TBD to clarify that.

DR. NETON: This is talking about reprocessed fuel, this material. So, is that recycled? Is that what they're talking about?

MR. NELSON: Well, the entire issue wasn't based on recycled uranium. That was just a point they had brought up, what about this. And I don't think that affects it at all the fact that it was --

MR. FITZGERALD: Yes, we were talking about the enrichment level. And I think the response is that even though there's, you know, some issue about what enrichment was involved, it wouldn't matter for this particular issue.

DR. NETON: Right. Similar to that last one we discussed in the --

MR. FITZGERALD: Right.

So, I would recommend closure on that clarification, Phil.

CHAIRMAN SCHOFIELD: Okay.

MR. FITZGERALD: But you're going to add some additional language just to kind of --

MR. NELSON: Yes.

MR. FITZGERALD: -- lay it out.

MR. NELSON: In fact, what we'll do is we'll provide you some responses. I can read you exactly what we have right here.

I got, since the gross alpha activity is used when reconstructing the internal dose, dose reconstructors have been given instructions to only use the gross alpha activity when both uranium mass and gross alpha activity are available. These instructions will be incorporated into the

next revision of the K-25 occupational internal TBD.

So, we didn't get a chance to respond to your response to clarify that, because we got these a couple weeks ago.

MR. FITZGERALD: Right.

MR. NELSON: So, this is -- we haven't prepared for this meeting.

Okay. Issue Number 2 was no default solubility classes for intakes. And specifically they're looking for, I think, a super Class S for -- of uranium.

And we have no literature to support there's any super-type S class uranium. So if you guys have any, we'll be glad to take the information. But we don't have any indications that there's any super-type S class uranium.

DR. NETON: I think there's two parts to this question. One is no default. And actually our response was that you default

to the most conservative and claimant-favorable solubility.

MR. STIVER: That's what I've seen.

DR. NETON: Right.

(Simultaneous speaking.)

DR. NETON: That answers that question.

And Chuck's right, the second part appears to be talking about some form of Super S uranium which I'm not familiar with. I mean, there is evidence certainly of Super S. And the ICRP just came out with some description of a model for other forms of highly insoluble cobalt and gold, I think.

MR. STIVER: Highly insoluble oxides. And I guess there's no evidence that those existed in --

MR. FITZGERALD: So, your position is basically you have no evidence of its existence.

DR. NETON: Particularly, I mean,

particularly for at K-25. I mean, this is a very -- I mean, people tend to get confused. There are more insoluble forms of uranium than the old Class Y, you know, that was, I believe, half life of about years or 500 days or something like that where Super S is much, much more insoluble than Y.

That covers the waterfront on the uranium that I've seen particularly in a gaseous diffusion plant. I've seen no evidence at K-25 that there is this form of uranium.

MEMBER ANDERSON: Where did it come from?

DR. NETON: Super S plutonium is just a very high-fired form of plutonium that just doesn't move out of the lung. It's been documented in a number of cases, particularly at Rocky Flats and Hanford.

Yes, we modeled that, actually, and then we provided the Rocky Flats data to

the ICRP at their request. And they used that in their latest draft revisions to handle insoluble forms of plutonium.

But I have not encountered at this point real Super S-type uranium.

MR. FITZGERALD: Yes, when you're dealing with high-temperature processes, that's where you would --

MEMBER ANDERSON: Form that.

MR. FITZGERALD: -- where you would have some potential. So, there's a question of whether or not that was encountered in the gas diffusion plants, and apparently not.

MEMBER ANDERSON: So, I learned something new today.

MR. FITZGERALD: So on that basis, I would say, yes.

MEMBER BEACH: So, closed?

MR. FITZGERALD: Yes.

DR. MAURO: This is John. Just one quick question, Jim.

This is -- I know there's been some discussion before about the concept of high-fired issues with uranium. It's important because what you're saying is really there is no evidence that there is this special form of uranium that actually behaves in an even more -- a less transportable way than Type S.

I might have missed it. I was listening and --

DR. NETON: Well, I'm not seeing any, and I would couch it though right now and say specifically at K-25. Let's draw the line there.

DR. MAURO: Oh, okay. Okay.

DR. NETON: There are more insoluble forms, but I think that you would find that S might bound them.

I mean, I don't know. I don't want to categorically say that it doesn't exist.

DR. MAURO: Okay. The only reason I did jump in is because we have on other occasions made mention of high-fired uranium. And, you know, if it turns out that this is really not in the same category as the high-fired plutonium, that you don't have the same path of evidence, that there really is such a thing and that it's of concern at some facilities.

So, basically what you're saying is really at this facility, you don't see any reason to think there might have been an issue, but there might be an issue at other facilities.

DR. NETON: Well, you know, I'm skeptical. Let's put it that way. But I don't want to close the door.

I've learned, you know, through the years not to be sort of categorical up front.

DR. MAURO: Okay.

DR. NETON: And I'm willing to look at it. I did notice, for example, that the ICRP report that came out in 2010 had a little table, and for some reason, they included what if there were highly-insoluble S, what it would do dosimetrically.

So, they provide no evidence that it ever existed, but they use it as an example.

DR. MAURO: Okay. Very good. No, I appreciate that. Thank you.

DR. NETON: And so, you know, I would leave the door open. I would say at K-25, I'm not seeing any evidence of that, but it's something that we need to keep our eyes open for, I think.

DR. MAURO: That's great. Thank you.

MR. FITZGERALD: Yes, John, we raised this because it certainly was implicit in the TBDs that it wasn't an issue, but just

wanted to be, you know, wanted to confirm that.

DR. MAURO: Okay.

MR. FITZGERALD: Well, in this case, for K-25 anyway.

CHAIRMAN SCHOFIELD: Okay. We can call that one closed with that caveat there?

MR. FITZGERALD: Yes.

Number 3, this is default isotopic distributions are not claimant-favorable.

Chuck, do you want to -- I guess we wanted to clarify that you're going to drop curium.

MR. NELSON: Yes, I think your issue was -- is that we want to drop curium-242 and 244. And basically we can't just drop it without some confirmatory basis.

We found no evidence of this to be a concern at K-25. Michalene actually went through to try to figure out how did this get in the TBD and why did it get in there.

Michalene, do you want to cover that, or would you like me to go over that?

MS. RODRIGUEZ: No, I can go over it.

MR. NELSON: Okay. All right.

MS. RODRIGUEZ: Yes, I did find the document where that came from is actually SRDB 14484, Table 1-1. And it is a table that lists curium-242 and 244 as principle radionuclides at uranium facilities and at gaseous diffusion plants.

The document also includes information regarding Y-12. It considers Y-12 as the uranium facility, and then it also includes the gaseous diffusion plants. It also has information regarding X-10.

The document is entitled "Internal Dosimetry TBD for Bechtel Jacobs." And later on it goes on and talks about the potential exposures at the gaseous diffusion plants and the radiological hazards. And both are

radionuclides. Neither one of them were discussed in this section. Only uranium, plutonium, americium, technetium and neptunium. So, curium was no longer discussed.

So, I'm not really sure. It may have been part of, you know, trace elements from the Savannah River Site in -- for the transuranics, but this is the only document that I have actually found that talked about curium.

All other references that I reviewed for K-25 have no mention of these two radionuclides.

MR. NELSON: In other words, we couldn't find anything to support them to be in there other than that internal TBD and it was only by mention in a table. It wasn't called out in the radiological hazard section, which was Section 12, or Section 11, which was evaluation for exposures at K-25.

MR. FITZGERALD: Okay.

MR. NELSON: I know it's listed as an isotope of concern for Hanford, but I think there were certain processes that concentrated at Hanford.

I'm not familiar with those, but I've seen those in dose reconstructions.

MR. FITZGERALD: Well, I've seen it elsewhere as well. It shows up at Los Alamos. I was just wondering why it would fall out here.

So, it really -- you're saying that there isn't -- going back and looking at the basis documents, there doesn't seem to be a real strong argument for this being listed.

MR. NELSON: Exactly.

MR. FITZGERALD: Just to complete, we raised a number of issues here. Various plutonium isotopes. And I think your response was that you were using Pu-239 to represent all the isotopes. And you were going to

clarify that in a footnote to Table 5-6 in the next revision.

MR. NELSON: Correct.

MR. FITZGERALD: Relative to the enrichment issue, the famous enrichment issue, I think we were questioning the two percent and you were going to, I guess, make it three percent?

MR. NELSON: Let's see.

MR. FITZGERALD: As far as the default enrichment, which I think was the value that was used --

MR. NELSON: Yes, that's correct.

MR. FITZGERALD: -- on the Paducah.

MR. NELSON: Yes, that's the same as response to Item 1.

MR. FITZGERALD: Right.

And on technetium, you're going to take another look at the default value listed in Table 5-6 for that?

MR. NELSON: Correct.

MR. FITZGERALD: These were all questions on one particular table that had the default isotopic distributions enclosed.

Phil, I'd recommend closure based on that nuclide-specific accounting.

MEMBER BEACH: So, it says in Table 5-6, you're going to correct it.

MR. NELSON: Yes.

MEMBER BEACH: And what will that be corrected up to? That last one. That technetium and --

MR. NELSON: It requires further evaluation. And correct me if I'm wrong, Michalene, but I think this is part of our evaluation that we're going to do with recycled uranium.

MS. RODRIGUEZ: That is correct. Right.

We don't have a value right now, but we are working on getting some new numbers

because we do know that the technetium value is too low. It's not bounding.

MEMBER BEACH: Okay. Well, I just hate to close it unless we know what that value is going to be.

MR. NELSON: I think that's picked up in another comment; is it not?

MEMBER BEACH: Is it?

MR. NELSON: Let me look.

MR. FITZGERALD: Why don't you hold it in abeyance if you want to --

MEMBER ANDERSON: Yes, why don't we do that.

MR. NELSON: Right here on Number 3, NIOSH agrees tech-99 default value listed in 5-6 requires further evaluation.

MEMBER BEACH: Which we closed 3-2, didn't we?

MEMBER ANDERSON: Yes.

MR. FITZGERALD: No, we are -- it's in Three. We're on Three. So, you can hold

it in abeyance.

MEMBER ANDERSON: Any idea how long that will take?

MR. NELSON: My understanding, it's going to take months to do that because of the -- we've got to look at all the recycled uranium documents.

And when they have to -- I don't know to what level we're going to go into source documents, because -- and I know if you start going into boxes for Fernald, there were hundreds and hundreds of boxes on recycled uranium.

So, I think our initial focus is going to go with the summary documents, the recycled uranium mass balance report and those type of documents, the PACE document and so forth for Paducah.

Bryce, do you have any expansion on that?

MR. RICH: No, that's correct,

Chuck.

MR. NELSON: Okay. So, it's going to take some time to go through all that.

MR. FITZGERALD: Maybe in abeyance would be a better way to leave that one.

MR. NELSON: It's going to take some time. Months.

MEMBER ANDERSON: Otherwise, we'll forget.

MR. FITZGERALD: But, you know, really the focus is on the technetium and the recycled, not the other ones which I think are --

MEMBER BEACH: Yes, the last --

MR. FITZGERALD: The last bullet at the end.

MEMBER ANDERSON: Yes. Okay, Number 4.

MR. FITZGERALD: Number 4, we were just going through Table 5-4 and 5-2 in terms of the -- these are the classic tables that

list the nuclides by facilities.

And it just appeared that there were facilities that were -- that were left out, that all the key facilities may not have been accounted for.

And I guess it's the 16497 document, that Reference ID, SRDB number, is the basis for what's listed in the TBD.

And we had identified some other references that listed other facilities that would contain, you know, potentially, you know, source terms that would be of equal consequence.

And that was of more a question of trying to reconcile the current list that's in the TBD with perhaps a somewhat broader listing that --

MR. NELSON: NIOSH agrees with you and we're going to update the TBD to include more information. We're going to update Table 5-4 to make it more complete and it will

include some of the other facilities as discussed.

The site description has a little more discussion that we could roll into there.

MEMBER ANDERSON: When were these first developed?

MR. NELSON: The TBDs, back in 2006 -- well, maybe 2004. The latest version is 2006.

MEMBER ANDERSON: Okay.

MR. NELSON: I know some of these documents were done in 2004, but they've been since revised.

MR. FITZGERALD: Yes.

MR. NELSON: So, they're outdated. They're due to be updated anyways, and that's ongoing.

MR. FITZGERALD: Okay. So, I guess hold that in abeyance and, you know, that listing will be addressed.

And I think the references are,

provide in the original Site Profile Review some of the other sources that were looked at.

Number 5 is the agree to disagree.

(Laughter.)

MR. FITZGERALD: Sorry about that. And of course this has to do with incident data, which is a classic issue that we always get into.

I think, Chuck, what you have in here is sort of an explanation. I'm pretty familiar with the description of how incident data is used. And we always push back a little bit and the notion of whether there's more incident data available.

MR. NELSON: I think what we agreed to do amongst ourself, is to go back and see if there's any more major incidents we could add to this table to make it more complete.

MR. FITZGERALD: I think the observation in the original Site Profile Review is that it was apparently a fairly

limited listing of incidents. And it appeared there was actually other references that might contain more.

MR. NELSON: Yes, we thought we could beef that up some.

CHAIRMAN SCHOFIELD: Have you found any logbooks from the health physics people?

MR. NELSON: I can't say that I know offhand. I haven't been through the entire site search -- research database, but I'm not sure whether we have those logbooks or not.

MR. FITZGERALD: Well, some sites were better than others. I think when they did the original Site Profile Review, they identified some files that might contain additional incident data.

So, they're just saying that, you know, it looks like there might be some other sources of information there.

MR. NELSON: Well, this is your --

it's the same age-old issue. If you have an individual with an incident and he's got urinalysis, we can reconstruct his dose.

So, if you have the data that shows what he was internally exposed to and you have some data, we can bound his dose.

So, even though he may have been involved in the incident, you know, and it may or may not be in his file, we can still bound his dose.

So, they don't necessarily provide a lot of information, is what I'm getting to.

MR. FITZGERALD: This sort of just gets back to the opening discussion we had. It's sort of yin and yang, meaning that to some extent you can identify job categories where, you know, one could assume a more chronic type of exposure.

But then with everything else, you're sort of stuck, you know, with identifying events. And to the extent you can

identify what somebody, you know, if they can't, you know, do a CATI interview, you know, be explicit, then the incident file might help.

But, you know, it's not going to be the panacea either. But my sense is that in the original Site Profiles in some cases, there was a lot that had to be done quickly. And sometimes it just wasn't possible to do as complete a job as identifying incident files. And I think this is something that can be done if there, in fact, is information.

It may turn out there might not be additional information, but it would be helpful to look.

I don't think this is disagreeing with that, right?

MR. NELSON: No, just what level do you want to dig in.

DR. NETON: Yes. Like Chuck said, we agreed we'd go back and include some more

incidents if we find them.

MR. NELSON: Should we go back to the site and say, give me everything you've got in the skin --

DR. NETON: But basically our position is, you know, for a long time there was the assignment of chronic coworker models unmonitored workers bound into incident exposures that have occurred.

Incident, you have spikes and they rapidly clear down. And you're giving a person a chronic exposure over their entire operating career at the facility.

And the way the coworker model is set up, even non-detectables are modeled in here. So, you've got an overarching excretion pattern that would include any incidents that occur.

People that are routinely monitored, their incidents are included in their excretion.

So, we feel the incidents are bounded within that chronic coworker model. This has been something we talked about over the last five or six years, you know.

MEMBER BEACH: Okay. So, we're just leaving this open in abeyance or --

CHAIRMAN SCHOFIELD: Yes, this one is in abeyance, I think, for right now. We'll have to look for more records.

MR. NELSON: I don't know that we necessarily want to agree that we're going to go to the site and say, give me all your incidents.

DR. NETON: We'll reevaluate what we've got in there and make sure --

MR. FITZGERALD: If you look at the Site Profile finding on that one, I think it provides a little context as to, you know, additional sources of information. And I don't think it said anything to the point of, you missed these, you know, all these files.

It's just going to indicate that the table that's provided is fairly scant.

MR. NELSON: Okay. I just wanted to make sure we weren't creating a job with limited return potential.

CHAIRMAN SCHOFIELD: Well, it seems like the health physics people would have like a record in the computer of incidents.

MR. NELSON: There's some descriptions or some summaries that we can pull from it. We can do a better job than what we did.

CHAIRMAN SCHOFIELD: Okay. Number 6.

DR. NETON: This is the one about using the median bioassay data to bound or to reconstruct unmonitored workers.

I think this is something we talked about before at another site. I think there's a little bit of misrepresentation of what we do in our response here.

And now that I look at it, we would never -- we don't typically assign the 84th percentile. We assign the 50th percentile or the 90th percentile.

The 84th percentile is just to get the GSD of the distribution. That's one standard deviation above 50.

I think what we talked about earlier, and I forget, Chuck, was it TIB-60 or 61 internal --

MR. NELSON: Sixty.

DR. NETON: We were going to provide some guidance in there about which classes of workers would get the median value versus the upper value.

I would propose that that's our response to this issue here.

MR. FITZGERALD: Yes, and the essence of this, this was a -- sort of a multi-part finding in the original Site Profile Review.

And I think what we're saying in this response is that this addresses sort of one question, but there were other questions in that, you know.

This probably doesn't do justice, this little summary here, to what was covered in that particular Site Profile finding.

There's different facets, and this sort of identifies at least four of the items that would be useful to get a response on.

Chuck, I know you have only had this for a couple weeks, but if you go back to the original finding, you know, you'll find it embedded in these four questions.

So, in addition to what Jim was talking about, these are other items that were in that finding that would be useful in getting some responses to.

DR. NETON: This is the first I'm seeing the use of ICRP 23 versus 89 volume parameters.

MR. NELSON: So, what individual issues do you want to --

MR. FITZGERALD: Well, I mean, just summarize the issues that were embedded in that finding. I'm just saying the summary that was in the matrix, I'll take responsibility for that.

Probably get in touch on those as much in detail.

MR. NELSON: Okay.

MR. FITZGERALD: You've only had this for a couple weeks, but --

MR. NELSON: I think one of them was the coworker data went from -- let me look at my notes here. '48 to '88. They started in 1945.

And I think one of your issues was what about these individuals for 1945 through 1947 which we don't have data on, you know, how does this coworker data represent those?

And Tom LaBone could probably talk

about this pretty good, because I think he had to deal with this before, this particular issue.

So, I'll let him pipe in on that one if he doesn't mind.

MR. LaBONE: I'm here.

Typically the way that we address that is that, again, this idea that if the workers were exposed to uranium from '45 through '47, and these same workers were monitored in '47, '48, '49 and so forth, is that you will build up a -- basically a systemic burden of uranium which will continue to be excreted.

And so if the intakes were significantly higher in the time frame where they were not monitored, then they would show up later on so it would account for that.

I think that's basically the logic that was used to continue to use the 1948-on coworker models for the people exposed during

that period just after World War II.

MR. NELSON: So, that was one issue right there that was called out. You read the several pages of the SC&A finding. What else is there?

I don't know how that sits with you all.

MR. FITZGERALD: Well, I think we just need to see -- this one is a little complex. I think we just need to see a written --

MR. NELSON: Okay.

MR. FITZGERALD: -- response.

MR. NELSON: We can provide a response to that. And if necessary, we can even put a White Paper on that one, but leave that up to the --

MEMBER BEACH: So, basically you'll just go back to the original items in the SC&A write-up and then produce a response to that?

MR. NELSON: Well, maybe we can

dial in on the actual finding here. Because, you know, sometimes when you try to summarize three or four pages into one sentence, it becomes difficult to nail it down.

MEMBER BEACH: So, do you need a clarification on that?

MR. NELSON: Well, I think maybe the finding ought to be clarified. Or we can just -- what we'll do is we got a response from SC&A on June 16th. So, we need to respond to that.

And I guess maybe in our response, we can call out those individual issues. I just don't want to miss any.

MEMBER BEACH: Well --

MR. NELSON: I mean, what are the key issues here.

MR. FITZGERALD: I think, again, we're just paraphrasing the original Site Profile issue. I'd go back to the original.

MEMBER BEACH: Page 38, it looks

like, and 39.

MR. FITZGERALD: Page 37, 38 and 39 of the K-25 review. May 2007. I would just go through that and respond to that, basically.

MR. NELSON: Well, my understanding is that the issue you had was using the 1945 through 1947 data. Other than that and what we've responded to, we said we used ORAUT-OTIB-60, which Jim just mentioned that was already in the response.

And SC&A came back and said we were unresponsive. And so, I guess we probably didn't provide adequate response for the period '45 through '47, which Tom LaBone just discussed, and we can provide that response --

MR. FITZGERALD: Earlier operations, yes.

MR. NELSON: Now, the ICRP 23 versus 89, I'm not -- I'm not necessarily

ready to discuss that.

DR. NETON: That's something that you'll look at.

MR. FITZGERALD: Here's the comment: NIOSH needs to assess whether acute or multiple acute intakes would provide more claimant-favorable assessments in urine bioassay data was normalized to 1400 milliliters, which is from ICRP 23, currently an outdated reference updated with ICRP 89 -- this is from 1974, now up to 2002 is 89 -- that used the 1600 milliliters per 24-hour excretion volume.

DR. NETON: The models were based on the 1400. We need to go back and look at all the implications of those changes.

MEMBER BEACH: So, does SC&A need to go back and clarify for the matrix the four points?

MR. FITZGERALD: No, it's in the issue. I think what I was concerned about

after looking at the response, I realized that it was really keying in on the brief descriptor that was under SC&A's draft finding, which I'll take responsibility for, but there were some facets that were missing in that descriptor that I think were in the original Site Profile finding.

So, it's less -- I don't think the -- I shouldn't say unresponsive, but there was issues that this didn't respond to that were not clarified in the -- in the -- what we're trying to do is paraphrase what's in the Site Profile Review trying to capture the essence of each issue.

And going back over after looking at your response, I realize there were elements that were embedded in this finding that were not addressed.

DR. NETON: I wonder if it wouldn't be good if SC&A would go back and redefine what the draft finding is.

MR. FITZGERALD: I'll be glad to do that, yes.

DR. NETON: Because otherwise the matrix will continue to have this --

MR. FITZGERALD: Yes, let me --

(Simultaneous speaking.)

MR. FITZGERALD: Let me do that. Because, again, I think I didn't see those elements until I was looking at what Chuck had given and said, oh, that's --

DR. NETON: I understand what you're saying, but I'd rather have that right than --

MR. FITZGERALD: Okay. We'll take that action to re-summarize Item 6.

DR. NETON: Right.

MR. FITZGERALD: But, again, I don't think it's going to include anything but what's --

DR. NETON: No, I understand that, but at least the matrix will have the right

description of the issue.

MR. FITZGERALD: All right. Right. We'll take that action.

MEMBER BEACH: The whole issue.

CHAIRMAN SCHOFIELD: Number 7 now.

MR. FITZGERALD: Number 7, we just had a clarification question which we gave you a couple weeks ago. I don't know if that's something you're ready to --

MR. NELSON: Well, in looking at all this neutron issue with the slow cooker and all that, we were looking at neutrons a little closer, and we looked at how we're assigning neutrons with Portsmouth and how we're doing it at K-25, and we felt we weren't real consistent.

So, we are revisiting assignment of neutrons at K-25. We think we need to look at some of these other areas besides the cylinder storage yard where neutrons could have possibly been elevated due to storage of

enriched uranium or holdup of uranium in certain areas where they may have handled or stored enriched uranium.

So, we think we've got some work to do on that one.

DR. NETON: That doesn't say that in this response.

MR. NELSON: No.

MEMBER ANDERSON: That's a bit different.

MR. STIVER: I thought I was on the wrong issue.

MR. NELSON: Well, right, it's not there. I mean, SC&A came back and said, well, we disagree, blah, blah, blah.

Well, in the meantime in the last month or so, you know, you get all three gaseous diffusion plants and you start comparing one to another and you see, well, this one is inconsistent and why.

I mean, while we don't believe

there is very many areas where you can get a lot of neutron dose at gaseous diffusion plants other than the cylinder storage yards, there are some that you should evaluate. And we think we need to do that evaluation at K-25.

And that's our current response, but we haven't given that yet --

MR. FITZGERALD: So, you have less of a problem with PORTS.

MR. NELSON: Well, Portsmouth we call out where we're going to assign neutron doses. And it's some other areas besides the storage yard.

MR. FITZGERALD: Right. And here, it's exclusively the storage yard.

MR. NELSON: Exactly. So, we need to look closer at K-25. So, that one is an open issue for us.

MEMBER BEACH: Perfect.

MR. NELSON: Let's see. SC&A

agrees with Number 8.

MR. FITZGERALD: Yes, that's right.

MR. NELSON: So, can we consider that closed then?

MR. FITZGERALD: Well, yes. Number 8, I think we wanted to see more explanation of -- that we thought it was unclear. There was a couple statements that were included that were seemingly at odds, but I think this description is helpful.

And you're suggesting a more detailed description along those lines?

MR. NELSON: Yes, exactly. The last sentence says, upon revision to the K-25 external dose TBD, will provide a more detailed description of assignment and processing of dosimeters. That way, you can better clarify site practices.

CHAIRMAN SCHOFIELD: So, we'll close that.

MR. FITZGERALD: We're back to

neutrons.

MR. NELSON: Yes, we're back to neutrons. Let's see. Let me make sure I understand this issue so I don't say it's the same as the answer before.

Let's see. A little attention was apparently paid to the possibility of neutron exposure in the early years.

MR. FITZGERALD: Actually, I think this is similar.

MR. NELSON: It would be prudent to revisit whether some categories of workers may have been exposed to chronic low-level neutron exposure.

So, yes, that's similar to Issue 7, and we're looking into that further.

MEMBER BEACH: So, we can basically combine Seven and Nine?

MR. NELSON: I think that would be a good recommendation.

MR. STIVER: During the response

there, you -- the last sentence there sort of establishing what operations have a potential for lower energy neutron exposure, did you mean low level?

We're looking at two different issues here versus the one down here.

MR. NELSON: That caught my eye as well.

MR. STIVER: Is that just a typo?

MR. NELSON: I was trying to see what the context is there.

You're talking about the SC&A response?

MR. STIVER: Yes, the SC&A response.

MR. FITZGERALD: I don't know. Low-level, I think, would be the --

(Simultaneous speaking.)

MR. FITZGERALD: So, you can combine Seven and Nine, would be the same response.

CHAIRMAN SCHOFIELD: Yes, Seven and Nine will be combined.

MR. FITZGERALD: And Number 10, I think, is the technetium.

MR. NELSON: Technetium data.

MR. FITZGERALD: Yes, it's the technetium issues which we spent time on already.

So, that was the first issue we discussed.

DR. NETON: Yes, this is a slightly different issue here than skin contamination.

MR. FITZGERALD: Right.

DR. NETON: This has to do with the external exposure potential. And I think we can roll that into that same analysis, I think.

MEMBER BEACH: Under Three?

MR. FITZGERALD: I think the issue was similar to what you were talking about earlier that, well, if they're wearing anti-

c's and gloves, then the potential would have been minimal.

But they wore coveralls and I'm not sure what gloves, it depends on the actual activity, but that's beside the point. It sort of gets down to what we talked about.

DR. NETON: I think we'll roll that into the same issue. I mean, it's an external exposure and a skin contamination issue for technetium.

And I think we sort of made an argument that the range of the betas are small in the dose. But if you had some very big concentration of tech-99, I suppose the dose rates could be high and I'm not sure the badges would detect it.

An open-window badge is an open window. Whether they were accounted for, I don't know. I think we need to go back and --

MR. NELSON: Technetium-99 beta at max energy shouldn't travel more than two

feet. So, if they had limited travel distance, gloves and the clothing you had is going to help attenuate it drastically.

And how many people are going to spend that much time in that distance and have one single location exposed?

MR. FITZGERALD: As far as the skin dose/extremity dose question not, you know --

MR. NELSON: So, I guess we need to evaluate the potentials for that.

DR. NETON: Yes, and we've already talked about doing that.

MR. FITZGERALD: Well, it's a different facet. One is exposure potential. The other is, you know, dosimetry in terms of skin dose.

DR. NETON: I think this whole tech-99 issue --

MR. NELSON: Yes, it should be rolled up into one.

MEMBER ANDERSON: Cuts across a lot

of them.

DR. NETON: We've got to do one sort of White Paper, I think, that cuts across several of the sites.

MR. NELSON: I think that would be the way to nail it.

MR. FITZGERALD: And that would be for all the gaseous diffusion plants.

MR. NELSON: Right.

MR. FITZGERALD: I recall technetium being a concern for the diffusion plants trying to make sure that the maintenance on that was addressed and would be useful.

MR. NELSON: It may be more significant at other sites. I mean, Portsmouth didn't handle near the amount of recycled --

MR. FITZGERALD: No, it varied.

MR. NELSON: But, yes.

CHAIRMAN SCHOFIELD: Yes, a White

Paper, I think, covering all three of them would --

MR. NELSON: Yes, I think it's a global issue.

(Simultaneous speaking.)

MR. FITZGERALD: It wound up in certain places and you had to be aware of that. And they were, actually.

So, the question is from a source-term standpoint, were people more protected when they were handling those operations or stages, or not, you know?

Was there an exposure potential that was significant?

CHAIRMAN SCHOFIELD: Is there any record of those people who handled a lot of it were on a separate bioassay program?

MR. STIVER: Separate bioassay?

CHAIRMAN SCHOFIELD: Like the recycled uranium.

MR. STIVER: You have the

granularity to identify those workers might have been --

MR. NELSON: I know that they monitor for technetium.

You're talking internal monitoring?

CHAIRMAN SCHOFIELD: Yes, internal monitoring.

DR. NELSON: Yes, they did monitor for it some periods of time. You probably heard something about these upgrade processes.

MR. STIVER: Yes, we looked at that in the Fernald RU paper. It's, from an internal standpoint, it's about a factor of -- three orders of magnitude lower than the uranium dose for the most highly exposed worker at the NIOSH default source. So, the scale was proportional.

That was, I believe, at nine parts per million. So, it's not a big internal dose issue compared to plutonium or neptunium.

What they were really concerned with was the contamination issue and what the --

MR. NELSON: Right. The external dose to your skin.

MEMBER BEACH: Does 11 tie in? Does that tie into Seven and Nine also, or is it --

MR. NELSON: I need to look at that.

MR. STIVER: I'm questioning the Point 2, the NG ratio.

MR. FITZGERALD: Yes, this seems like it would be, because --

MR. STIVER: Neutron/photon ratios all seem to be tagged to the --

MR. NELSON: That's all part of --

MR. FITZGERALD: Seems we need to look at other areas.

MR. STIVER: The same with Seven and Nine, I believe.

DR. NETON: Yes, some of these

findings all sort of run -- 12, I don't think is significantly different than 10.

MR. NELSON: I do have one change to make on Number 11. Where it says Site Research Database 7122, that should be 8122. That's the wrong citing.

MR. FITZGERALD: Oh, okay. The second study is 8122.

CHAIRMAN SCHOFIELD: Let's see. Where were we?

MEMBER BEACH: We're on 12.

CHAIRMAN SCHOFIELD: Yes, but what I was looking at is, do you guys just want to go on ahead, or did you guys want to break?

MEMBER BEACH: Well, let's get it done.

MR. FITZGERALD: I think we're almost done.

CHAIRMAN SCHOFIELD: I think so, too, but I'm not going to --

MR. FITZGERALD: Well, I think we

said 11 is the same as Seven and Nine.

CHAIRMAN SCHOFIELD: I just don't want to --

MR. NELSON: And 12 I don't see is any different than 10.

MEMBER ANDERSON: It's just described differently.

MR. FITZGERALD: Would the Work Group want to -- I mean, I would volunteer to try to simplify the matrix and combine these.

MEMBER BEACH: I was actually going to bring that up at the end.

CHAIRMAN SCHOFIELD: I think so.

MR. FITZGERALD: This just tracks -- just to avoid total chaos, this tracks the original Site Profile Reviews.

I didn't want to depart from that system. But, you know, now that we're this far along, we could combine them and just, you know, have an index to, you know, which one is a crosswalk to the Site Profile.

DR. NETON: I think that's a good idea.

MEMBER BEACH: So, 12 is Three, 10 and 12, right?

DR. NETON: I don't think it was Three, is it?

MEMBER BEACH: Yes, Three was combined.

MR. FITZGERALD: Yes, this would track the technetium.

MEMBER BEACH: Well, probably if you did that and sent it out fairly soon, that would help NIOSH with their review, I would assume.

MR. FITZGERALD: Well, yes, the ones that were combined are neutrons and technetium so we know where we are.

DR. NETON: Hopefully, you'll prepare a single response rather than copy and paste a response.

MR. FITZGERALD: Right, right,

right.

MEMBER ANDERSON: And then argue that.

MR. FITZGERALD: We'll start going through the back and forth of, is everybody is satisfied that it's clear.

But, yes, so Three, 10 and 12 would be combined.

MS. RODRIGUEZ: Excuse me. This is Michalene.

Number 3 actually has to do with the internal dose, and 10 and 12 is for external, so I would keep Three separate.

MEMBER BEACH: Well, remember the only issue we had was with the last paragraph on Number 3.

MS. RODRIGUEZ: Right.

MEMBER BEACH: The other ones were okay. So, that's why --

(Simultaneous speaking.)

MR. FITZGERALD: Yes, but the

technetium we're not arguing the internal. So, maybe that is -- she is correct. That's part of the recycled uranium review.

DR. NETON: That's internal.

CHAIRMAN SCHOFIELD: Drop Three out of that.

(Simultaneous speaking.)

MR. FITZGERALD: That's all the primary issues.

These are secondary issues and I'm just going ahead here. And, actually, we agree with all the responses on the secondary issues.

DR. NETON: Wow.

MR. STIVER: New record. Three sites before noon.

MEMBER BEACH: So, the other thing we have is Bob Alvarez's paper. And just to briefly go over that, I was assuming that you would kind of just briefly tell us what you're doing on that.

MR. NELSON: Well, that ties into the same issue of recycled uranium. The issue here is a -- in March of this year, SC&A sent a memo to the Work Group from Bob Alvarez regarding upgrade programs and how they were implemented at the gaseous diffusion plants from '72 to '81.

And, basically, he wanted to bring up the fact that we had recycled uranium components and how are we reconstructing dose.

Well, that's one of the issues -- that's one of our big issues that we're evaluating. So, that's the one I said is going to take some months to answer that.

MR. FITZGERALD: The added issue on that, and I talked to Bob, he was doing this at least to support the Fernald review, but, you know, the source of the tower ash at the gaseous diffusion plants.

And in particular, he was looking at the CIP/CUP era, and that's when they

literally, you know, revamped all the cascade and it was a major operation to, you know, to take these out to replace components and then put them back in place.

So, it was a pretty major operation. They had to staff up tremendously to do all that work. And taking these things apart, obviously the contamination was a huge issue.

And his concern was you had a different dynamic. It's almost like a D&D activity where you had crews that were taking all this -- I always think of it like sort of junk, and some of it was being just thrown away, some of it was being cleaned out and then put back in.

And, you know, being particularly conscious, I think my concern would be who was this population of workers that were involved in CIP/CUP?

It clearly was an expanded

workforce. It may not have been the operators that we're dealing with by and large at the diffusion plants, but it may have involved workers that were brought in for CIP/CUP to deal with the decon, deal with disposal, transport.

And whether or not that group of workers -- you know, came and they went, you know, type of thing and whether they were addressed sufficiently, I wouldn't call them transient workers, but they were sort of campaign workers. For the CIP/CUP campaign, they were brought in and they weren't needed after CIP/CUP was done.

And, you know, so how do you identify those folks and do they, you know, were they -- I would assume they were monitored by, you know, by -- I guess it was Martin Marietta back then, but, you know, or they or not.

So, really it was sort of a

question -- he raised it to my attention more or less, you know, he was looking at Fernald and the receipt of this material.

But did we sufficiently address those campaigns that lasted some years and the fact that all these additional workers were brought in specifically to do those campaigns?

And some of the workers -- not some, a lot of the workers weren't really operating-type workers. They were actually more of a D&D, if you may, maintenance-type people that were actually handling this stuff to clean it out and return it back to the plant.

And I went back and looked at the TBDs. I mean, the CIP/CUP is referenced in there, but there wasn't a whole lot of information provided.

And if you're a dose reconstructor, I'm not sure you'd be clear on who was involved in CIP/CUP and to what extent

is the information available for that or not.

So, that's kind of how I left this hanging that it wasn't addressed specifically in the original SC&A reviews. This sort of came up by way of Bob's involvement in Fernald.

It seems like a pretty legitimate issue if you're looking at revamping the Site Profiles.

For completeness' sake, I'd be, you know, interested in knowing, you know, this sort of additional subset of workers, you know, how they actually addressed the dose records and how were they monitored?

Were they, in fact, sort of like when we deal with a D&D, were they brought in just to do the campaigns more like construction workers and you'd have to sort of address them as such, or not?

MR. NELSON: Yes, I think it would be good to call them out. Whenever we're done

doing our evaluation on recycled uranium, recycled uranium components are going to be assigned to the life of each facility.

It's not, you know, that particular campaign, that's the only time they're going to get assigned. It's going to be assigned throughout the life of it.

It probably would make sense then to call out those folks that did that extra work there and look at that subset. And possibly, you know, when we come up with these tables, if we need to refine them, which I would imagine we would, at least we'll work with Paducah -- not Paducah, but Portsmouth and K-25.

You know, those particular years during those campaigns might be the years where we call out those people, and once we do a little more research, we might know better an assigned dose for that period of time.

But that's all part of the work in

progress for recycled uranium components.

MR. FITZGERALD: Yes, I think the question of the source term exposure potential is sort of a subset of --

(Telephonic interference.)

-- operations that were actually a very specific campaign.

MR. STIVER: Those were some of the highest concentrations that were found in the residues that were seen at Fernald. It really was -- this all came up as we were trying to really get a better handle on really characterizing what came in at what time periods.

So, you know, it was really --

MR. FITZGERALD: It was kind of interesting.

MR. STIVER: -- more of a big issue to the GDPs as much as it is for -

MR. FITZGERALD: If you read the sort of literature on CIP/CUP, they were

actually sending components through almost like a carwash.

MR. NELSON: Yes.

MR. FITZGERALD: They were being washed. There was so much contamination, they just had to wash it off.

MR. STIVER: The incinerator metric tons.

MR. FITZGERALD: I sort of worry, in that kind of scenario where you sort of had normal operations where you had the normal monitoring health physics program in place.

But if you're doing this over here, doing a carwash and doing this and that, I'm not sure what, you know, who was in charge, you know, what kind of controls and who was monitoring those folks.

So, that would be an unusual thing to do that. Sounds like it should made part of the recycled uranium.

MR. NELSON: Right.

MR. FITZGERALD: Not just Fernald, but actually the diffusion plants.

MR. NELSON: We're focused on the gaseous diffusion plants.

CHAIRMAN SCHOFIELD: I guess we're done.

MR. FITZGERALD: Okay. I will try to revamp these tables and circulate them and make sure everybody agrees that -- what we combined, which ones to try to simplify it.

I guess what we can do is just sort of trade these matrices and update them so they're accurate for your sake.

MEMBER BEACH: Sounds good.

So, anybody on the phone have anything? If not, we're going to adjourn this meeting.

MR. KATZ: Great job everyone. You guys plowed through a lot in a hurry.

(Whereupon, the above-entitled matter went off the record at 12:10 p.m.)