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NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

convenes the

WORKING GROUP MEETING

ADVISORY BOARD ON

RADIATION AND WORKER HEALTH

ROCKY FLATS

VOL. I

The verbatim transcript of the Working Group Meeting of the Advisory Board on Radiation and Worker Health held in Hebron, Kentucky on August 31, 2006.

C O N T E N T S
August 31, 2006

TRANSCRIPT LEGEND

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(By Group, in Alphabetical Order)

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FITZGERALD, JOE, SC&A
HOWELL, EMILY, HHS
JESSEN, KARIN, ORAUT
KOTSCH, JEFF, DOL
LIPSZTEIN, JOYCE, SC&A
MAKHIJANI, ARJUN, SC&A
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MCFEE, MATT, ORAUT
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POTTER, GENE, ORAUT
RICH, BRYCE
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ULSH, BRANT, NIOSH

P R O C E E D I N G S

(9:30 a.m.)

WELCOME AND OPENING COMMENTS

DR. LEWIS WADE, DFO

DR. WADE: This is Lew Wade, and I have the pleasure of serving as the Designated Federal Official for the Advisory Board, and would like to welcome you to a working group meeting. This is a working group that has devoted itself to -- to many issues. Today it's looking specifically at issues that surround Rocky Flats. It started by looking at the Rocky Flats site profile and now has sort of focused its efforts on those issues in the Rocky Flats site profile that are germane to the Board's consideration of the Rocky Flats SEC petition. And again, this is a long-working and hard-working working group.

It's chaired by Mark Griffon and its members currently include Mike Gibson and Robert Presley. I will talk a little bit about membership of the group in a moment as I explain to you the current status of Wanda Munn.

But before I do that, let me ask if there are any Board members on the call at the current time?

MR. GIBSON: Lew, this is Mike. I'm here.

DR. WADE: Okay, Mike. Welcome. Any other Board members on the call?

(No responses)

Okay, we don't have a quorum of the Board and I didn't think there was any risk that we would. That's something that I need to check into. Let me deal with the situation with regard to Wanda Munn. I think -- for those of you who haven't heard any of it, I'll start at the very beginning and go quickly. The Board has a policy of rotating members off periodically. I was notified that the White House, who handles such appointments to this Board, had made the decision to rotate off Wanda Munn. This was some months ago. But I made that announcement and we proceeded down that path. I was then notified that Wanda had been reappointed -- the intention was for Wanda to be reappointed to the Board, and that is my current belief, that we are in the process of having Wanda reappointed to the Board. It's my extreme hope

that Wanda will be reappointed to the Board and duly seated by the mid-September Board meeting in Las Vegas.

While Wanda was absent from the Board, the Board took an action to re-staff its working groups based upon the fact that Wanda and Dr. DeHart were being rotated off the Board. With regard to this working group, the Board decided to leave its current members of Griffon, Gibson and Presley and not add any additional members. So technically speaking today, as best I know, Wanda is not a member of the Advisory Board. If Wanda was to be a member of the Advisory Board by the executive action, she would not be a member of this working group until the Board reinstates her, which I have every expectation it will do, but the Board can only take actions when it meets with a quorum present. So I would imagine the Board would address itself to that issue early on in its deliberations in September. So we're left with this call and its work.

I've always believed that one should make their decisions based upon what serves the process and the people best. And I believe that the

process and the people would be best served by having Wanda participate fully in this working group call -- not as a member of the working group, not as a member of the Board, but we have let members of the public participate in this process when it's the opinion -- when it's my opinion and the opinion of the chair that the process is better served by their participation.

I've discussed this with the chair and he concurs. I am inclined to allow Wanda to participate fully in this working group. Remember, it's not a subcommittee, it's not a committee, it takes no formal action. I am inclined to allow Wanda to fully participate in this call of the working group, but I would open it up to any comment that any would like to make pro or con the position I'm putting forward.

So is there anyone on the call or around the table who would like to speak to the issue of Wanda's participation in this working group call?

MR. GIBSON: Lew, this is Mike. I agree.

DR. WADE: Thank you, Mike.

DR. WADE: Okay. Hearing no objection then, for the record, I would make the decision that the working group would invite and encourage Wanda to participate fully in these deliberations.

Wanda, we appreciate your being with us and we appreciate your forbearance in this, certainly.

MS. MUNN: Thank you, Lew. I understand.

DR. WADE: Thank you. Okay, so now to the business of introductions. We'll go around the table here. Again, as members of the SC&A or NIOSH or the ORAU team identify themselves, please identify any conflicts you have -- personal conflicts you have with regard to our deliberations. Then we'll hear from people on the line, and then finally you'll get -- be able to get down to work.

This is Lew Wade and I serve as the Designated Federal Official of the Advisory Board.

MS. JESSEN: I'm Karin Jessen and I work with ORAU -- the ORAU team, and I have no personal conflicts.

DR. ULSH: This is Brant Ulsh with NIOSH, no conflicts.

MR. MEYER: Bob Meyer with the ORAU team, no

conflicts.

MS. HOWELL: Emily Howell with HHS, no conflicts.

DR. MAURO: John Mauro with SC&A, no conflicts.

MR. ALLEN: Dave Allen with NIOSH, no conflicts.

MR. ELLIOTT: Larry Elliott, NIOSH, no conflicts.

MR. CHEW: Mel Chew, ORAU team, no conflicts.

MR. FITZGERALD: And Joe Fitzgerald, SC&A, no conflicts.

DR. MAKHIJANI: Arjun Makhijani, SC&A, no conflicts.

DR. WADE: Let me ask that -- oh, I'm sorry.

MR. GRIFFON: And Mark Griffon -- that's all right. Mark Griffon, no con-- no conflicts. No comments, either.

DR. WADE: I -- I -- okay. On the line do we have other federal employees who are on this call in an official capacity?

MR. KOTSCH: Jeff Kotsch for the Department of Labor.

DR. WADE: Welcome, Jeff.

MR. BROEHM: Jason Broehm from the CDC Washington office.

DR. WADE: Welcome, Jason. Other federal employees on this call in an official capacity?

(No responses)

Other members of the NIOSH contract family, ORAU team?

MR. FALK: This is Roger Falk, and yes, I am conflicted.

MS. BRACKETT: This is Liz Brackett, I'm not conflicted.

MR. MCFEE: Matt McFee with the ORAU team. I am not conflicted at Rocky.

MR. POTTER: Gene Potter, ORAU team, conflicted.

MR. BUCHANAN: Ron Buchanan, SC&A, not conflicted.

DR. WADE: Welcome, Ron. Always a pleasure to have you with us.

MR. BUCHANAN: Thank you.

DR. WADE: Other members of the SC&A team?

MS. ROBERTSON-DEMERS: Kathy Demers, not conflicted.

DR. WADE: Welcome, Kathy.

DR. LIPSZTEIN: Joyce Lipsztein, SC&A, no conflict.

DR. WADE: Any other of our colleagues from

SC&A?

(No responses)

Anybody else on the line who wants to identify themselves?

MS. MUNN: This is Wanda Munn. I'm confused but not conflicted.

DR. WADE: Okay. Wanda we -- you must have drifted away. We -- could you repeat your comment, Wanda?

MS. MUNN: I said I'm not conflicted, only confused.

DR. WADE: Okay, no --

MR. GIBSON: This is Mike, I have no conflicts.

DR. WADE: Well, I share your confusion. Anyone else who wants to identify? Do we have petitioners or petitioners' representatives on the call who wish to identify themselves?

MS. BARRIE: This is Terrie Barrie with ANWAG.

MS. BARKER: Kay Barker with ANWAG.

DR. WADE: Thank you both for joining us. We appreciate your participation. And feel free to participate as fully as you would like.

MS. BARKER: Thank you.

MS. BARRIE: Thank you.

DR. WADE: Anyone else?

(No responses)

Okay, Mark. Sorry.

MR. GRIFFON: Okay, I guess we'll -- we'll start the workgroup meeting off and I -- I'm trying to wonder -- trying to figure out if we should work -- I -- I think I'd rather work from an agenda that I drafted on the plane this morning on the way here rather than go through the entire matrix one by one. And then at the end of the meeting, time -- time available, we can double-check to make sure we didn't miss any matrix items. But I think I'd rather -- 'cause there's some large priority issues that I don't want to miss or save till late in the afternoon when we're all trying to rush out of here, which I think would be better. So let me just run down the issues and then we can see if this makes sense.

MS. MUNN: Mark, (unintelligible).

DR. WADE: I'm sorry, Wanda, we can't hear you.

MS. MUNN: I asked if he might have e-mailed that.

DR. WADE: Did you e-mail?

MR. GRIFFON: I can't e-mail it 'cause it's chicken-scratch on my pad of paper right here,

so you're hearing it live right now. It's nothing new, though, Wanda, that you won't -- I mean it -- it's just a way to -- to sort of boil down a lot of these matrix items into some -- some of the bigger items.

MS. MUNN: (Unintelligible)

DR. WADE: Okay.

MR. GRIFFON: Number one is just an update on the super S question.

Number two would be issues related to neutron dose issues and -- and the TIB-58 coworker model, which is that external coworker model.

Number three is this other radionuclide section -- starring Mel Chew, I imagine.

Number four -- number four will be the internal coworker model, TIB-38, some discussions on that.

Number five is the data reliability question, which has several sub-pieces, including both the external data, internal data checks, the safety reports, the '69 dosimetry gaps and some -- and -- and the -- a fairly long list of individual -- I guess I'll call them individual allegations or -- or statements in the petition itself, so...

And then the last one, number six, is a question on the D&D worker dose reconstruction. So I think that gets most of them. You know, like I said, at the end we might want to quickly go through the matrix, or I can even at lunch kind of go through and check off which ones we got through and see where we're at with that, but I propose kind of starting with that and see how it -- see how it evolves, if that's okay. Everybody okay with that?

(No responses)

MR. GRIFFON: Is that all right, Brant?

DR. ULSH: Sure, Mark.

SUPER S MODEL

MR. GRIFFON: Okay. First item is the super S -- the question on the super S model, and I -- I think where this still stands is -- is that, you know, we -- we've had a -- had a fair amount of review by -- by SC&A on the model itself. NIOSH did provide the 25 cases that I was asking about, just to make sure the design cases were the -- the, quote/unquote, right ones. And -- but I think that's sort of hanging out there, that we haven't closed that out as far as anyone looking at those 25 cases

and checking it against the -- the design cases used just to see if they -- if -- if the selections made sense and -- and were appropriate and were at least consistent with the other cases. So -- is that right, Joe?

MR. FITZGERALD: Yeah.

MR. GRIFFON: I don't think that SC&A's really looked at that. We have the -- the things on the O drive, the identifiers of --

MR. FITZGERALD: Right, right.

MR. GRIFFON: -- those individuals.

MR. FITZGERALD: We had some other issues that we're pursuing, but that's underway and presumably -- and I guess Joyce will be a judge on that, too -- will be a couple -- at least a couple, two or three, weeks before we would have the analysis, but yeah, we understand the -- the need to do that.

MR. GRIFFON: But -- and I think, as we said last meeting, the big thing I think was that the model seems to be -- everybody seems to agree that it's solid, you know --

MR. FITZGERALD: Yeah, I think that was --

MR. GRIFFON: -- we're okay with the model itself. Right?

MR. FITZGERALD: Yeah, that -- the run-up to the last workgroup meet-- not workgroup meeting, Advisory Board meeting, I think we spent a great deal of time looking at the model, so I think now we're just doing the validation on the data, and that's something we can finish up --

MR. GRIFFON: Right.

MR. FITZGERALD: -- relatively soon.

NEUTRON DOSE/TIB-58 COWORKER MODEL

MR. GRIFFON: Okay. And the second item is -- I -- I think I -- it sort of rolls into some sub-items, but I'll -- I'll frame it in -- under the category of TIB-58 and the coworker model, and I actually -- there was a -- a call -- between meetings here I think NIOSH and SC&A got together to discuss both these coworker models, so -- and I'm a little out of the loop on that one. I -- I did see some e-mail traffic, but I -- I'd turn this over to maybe Joe to kick off or Brant to kick off, either way.

MR. FITZGERALD: Well, I thought it was a pretty productive conference call and I think it clarified a lot for us in terms of some of

the issues. And a lot of the issues were the back extrapolation in terms of the neutron-to-photon ratios and I -- I think the minutes for that meeting are pretty much where we're at now in terms of the understanding and the -- I -- I thought there was another couple of actions to go back and pursue it and we did get your e-mail a couple of days ago with a little more clarification, so...

DR. ULSH: Yeah, there were about -- well, there were a number of action items that -- for NIOSH that came out of that meeting. First was to obtain HIS-20 external dosimetry data from Ken Savitz* and post that on the O drive. That is available on the O drive, to the extent that -- I mean the HIS-20 data that was used for the coworker model is available on the O drive right now.

The next action item was that we committed to recheck the numbers in OTIB-58 Table 7.1 and 2 for the years '52 through '69 using the NDRP data in HIS-20. And this was an issue that we discussed at some length during the meeting. What was done in the current version of the TIB is we looked at the distribution of I think

penetrating doses for all of the Rocky Flats workers for that -- for that year -- you know, the relevant years. That was in one table. And then we did the same kind of exercise, but excluding NDRP data, ND -- people who are involved in the NDRP. And that -- that second analysis was then used -- the idea here was to de-convolute which part of the penetrating doses was due to gamma and which part was due to neutrons. And throughout the course of our discussion with SC&A I think we became kind of convinced that that may not be the best approach to take, so what we committed to do was go back and take another look at those tables and make sure that what we're doing is appropriate and modify where appropriate. That is in progress.

The next action item was to add some descriptive language to the TIBs explaining the basic use for our extrapolation of neutron-to-gamma ratios for two time periods. We had some ratios in '59 and those were extrapolated back into the '50s. We also have neutron-to-gamma ratios from 1977 forward, and those were extrapolated back to cover the time period 1970

to '76. And SC&A had some questions about that. You know, what -- what bases we were using to make sure that that was appropriate. As Joe mentioned, I did send over some language that we are in the process of inserting in those TIBs -- just a couple of days ago, so I'm sure you haven't had time --

MR. FITZGERALD: Yeah.

DR. ULSH: -- to review it yet. So we look forward to getting SC&A's thoughts on -- on that.

The next action item was Roger Falk was going to investigate the NDRP Table 1.1 and provide some background to Ron Buchanan. That was accomplished fairly quickly. On August 15th Roger sent that to Ron.

And then the final thing we were going to do is spot-check the coworker methodology by comparing calculated versus measured neutron doses for '52 to '59. So once we come to an agreement on exactly how we should go about de-convoluting these penetrating doses, then we would then go back and look at people for whom we have measurements, just to make sure that our method gives a claimant-favorable approach.

And I think -- I think it was John, you come up with some really pithy statements that tend to stick with me, John. I think you described that as kind of the *coup de grâce* in terms of validating this approach, so we are also in the process of doing that.

And I think that's pretty much where --

MR. FITZGERALD: Yeah.

DR. ULSH: Some of the action items have at least moved out of our court. Some of them we're still working.

MR. GRIFFON: Can -- can you go back to the fourth one there, NDRP Table 1.1?

DR. ULSH: Yes.

MR. GRIFFON: You sent some background materials to Ron. Was that posted or is that just sent to Ron?

DR. ULSH: That was an e-mail that Roger sent to Ron and copied me on -- on that.

DR. MAKHIJANI: I have a copy of that in my computer, so --

MR. GRIFFON: So -- so it wasn't a lengthy document or --

DR. ULSH: I don't --

MR. GRIFFON: -- anything --

DR. ULSH: No, no, no.
MR. GRIFFON: -- it was a --
DR. ULSH: It was just a --
MR. GRIFFON: -- more or less a response.
DR. ULSH: -- yeah, a couple of paragraphs, I think.
MR. GRIFFON: All right.
MR. BUCHANAN: Yeah, this is Ron. Yeah, they -- he just sent at -- explained that -- where those figures came from and that was preliminary report and not a -- complete the report in the NDRP.
MR. GRIFFON: Okay.
MR. FITZGERALD: It was a matter of clarification then.
MR. BUCHANAN: Yes, uh-huh.
MR. FITZGERALD: The other item, Ron -- and again, we've only had a couple of days to look at the descriptive language, but I think in our conversation in the meantime, informal conversation, I thought there was some question about whether in fact there were some neutron-to-photon ratios from the earlier years that could be also used to benchmark. Is that clear -- was that pretty much what we're arriving at,

Ron?

MR. BUCHANAN: Well, yes. Brant sent -- yesterday or day before yesterday, I'm thinking day before yesterday -- some explanation, and I have no qualms with his explanation, but I did think that if we could at least look at some benchmark -- you know, experimental or something that was done in the early years -- compare that to the N/P values of '59, it'd be a little more reassuring numerically that they matched. And so I don't know if those figures are available, but I think somebody at some time made some kind of neutron and photon measurements in the '52 to '58 time frame that we could look at and see if those are, you know, similar to what they're listing in the NDRP table -- 11.1, I think it was. You know, they list at about 1.3, in that area, which is reasonable. But it'd be nice -- more reassuring if we could look at a couple of measurements actually made during that period of time. And the same way with these -- the '76 time frame comparing to the later time frame. If we could just find a few measurements representative of work area and

they showed a ratio of about one, then that'd be more reassuring.

DR. ULSH: I don't want to react to that on the fly --

MR. FITZGERALD: Yeah, I know. Again, this was sort of a dialogue we've had over a couple of days now since we received the memo and it just struck us that, you know, instead of the modeling aspect, if there was actually some empirical way, that would really put it to bed and -- we don't know. And I -- certainly we haven't seen any data and there might -- but certainly in the later period -- you'd think in the '70s there would be data. I'm not sure about the '50s, but...

DR. ULSH: I'll talk it over with the team and see if -- if that might exist somewhere and, you know, we'll see what we can do on that.

DR. MAKHIJANI: We're talking about the last item. Right? The one that -- that --

DR. ULSH: This is -- I think we're talking about the extrapolation --

DR. MAKHIJANI: Yeah.

MR. FITZGERALD: Yeah.

DR. ULSH: That would be action item three of

these from the meeting --

MR. FITZGERALD: I think the dialogue resulted when we got the descriptive language, but it was sort of like a light bulb or something -- you know, why isn't there at least an empirical benchmark; that would kind of put it to bed without getting into a lot of modeling.

DR. MAKHIJANI: Doesn't that go to the last point?

MR. FITZGERALD: It does go to the last point, as well.

DR. ULSH: Spot-check coworker methodology by comparing calculated versus measured neutron doses?

DR. MAKHIJANI: Yeah.

DR. ULSH: I think what that one was, Arjun, if my memory serves correctly, for those people for whom we had both measured neutron and measured gamma, what we would do is take the gamma measurements for those people, apply our --

MR. GRIFFON: De-convolution technique (unintelligible) --

DR. ULSH: -- yeah, apply our methodology that -- you know, if it's a ratio, see what -- what

kind of a neutron dose would be predicted, and then compare that to what they actually had measured.

DR. MAKHIJANI: So you would do that for people for whom you had records for neutron and gamma for both periods, '58/'59 and '52 to '57. That's what I remember us discussing last time.

DR. ULSH: I'm not sure about the '70 to '76. I think we had the issue there -- I don't know, I don't want to speak off the cuff, Arjun, 'cause I'm not too sure about this --

DR. MAKHIJANI: Yeah, I remember the--

DR. ULSH: -- but I was thinking that we only had penetrating, we didn't have the de-convoluted in '70 to '76.

MR. GRIFFON: I don't know.

MR. BUCHANAN: Yeah, it was '70 to '76 we understand that you only have -- this is Ron again -- you -- you only have the composite dose and so they'd use the .42 N/P ratio to de-convolute that and -- and calculate the doses separately and compare that to the total assigned dose and see which was higher and would use that. That's the way I understood that, that the '70 to '76 was a composite dose

in the records.

DR. ULSH: I think that's right, Ron.

DR. MAKHIJANI: But last time I understood Roger to say that for the NDRP period, '52 to '69 -- right, Roger?

MR. FALK: Yes, that is right.

DR. MAKHIJANI: Okay. For the NDRP period there were actually paper records of these doses with separate gamma and neutron dose records that they were actually able to go and make a database out of it, which is how they did their work. And I'm just wondering if there are these paper records for '52 to '69, which are already -- we don't need to be de-convoluted. Right? There are already separate gamma and neutron doses. Why are they not there -- why would you expect that you wouldn't find them for '70 to '76?

DR. ULSH: I don't know the answer to that off the top of my head. Can anyone jump in?

MR. BUCHANAN: Yeah, this is Ron again. I think that the NDRP covered the time from '52 to '69, and so they -- they reread it so you had a separate neutron/gamma reading, whereas '70 to '76 was not covered by the NDRP report

and so all we have there is composite. And so -- now let me add that the '52 to '58 did not have hardly any neutron measurements, so even though you -- you do the NDRP, those earlier years had very few -- few neutron plates read by Los Alamos. And so the question remains and -- is that -- that you have to use N over P to determine the neutron dose in the '52 to '58 time frame because there was hardly any neutron measurements; even if you went back and reread them all, there's very few. And that brought down to the fact that I requested what data was available '52 to '58 in the neutron field on the individual worker basis, and as of yet I have not received that information.

DR. MAKHIJANI: My -- my understanding was -- was not that. But Roger, you have to correct me if I'm wrong here because this -- this is my understanding of what I think you did is that for the people who had -- who -- who had the potential for neutron exposure but were not necessarily monitored, for all of those people you found paper records for their doses. Is that right? And made a database of them that you can actually query.

MR. FALK: We found the paper dosimetry worksheets for the beta/gamma doses.

DR. MAKHIJANI: So for the whole '52 to '69 period for -- for all workers who had the potential for neutron exposure, even those who were not monitored. Right?

MR. FALK: Yes, and that was used -- that was used as the basis for the nosherel* doses because you -- you then multiply the gamma dose that was recorded on the worksheets times the -- times the neutron to gamma ratio. That is the whole basis for nosherel dose.

DR. MAKHIJANI: And that -- that's where I think this whole discussion of comparing the calculated de-convoluted dose with the NDRP query-able database came from -- sorry, a mouthful -- and so I'm -- I'm wondering if there are these paper records, why can't -- I did take a look at your 1976 -- 1970 to 1976 and how -- the justification for back-extrapolation. Obviously it was a very quick look. There's been a lot of paper. And I actually am a little bit uncomfortable with a statement -- it doesn't seem to be consistent, that it took -- it took time to recover from

the fires, so it means there were new things going on during the recovery period. But at the same time, the '70 to '76 period in its entirety was similar to the post-'77 period when production had resumed, when new equipment had been installed and everything was presumably functioning very smoothly and so on. So I -- I just -- I just -- I think it would be much better to -- to actually look at the records if they're available, at least to find out whether they're available or not.

DR. ULSH: Well, a couple of clarifications there, Arjun. Mel's going to go into more detail about the recovery efforts from the '69 fire a little bit later on the -- I'm looking at Mark's agenda -- somewhere today --

MR. CHEW: It's not on the agenda.

DR. ULSH: -- we'll talk about that.

MR. GRIFFON: We'll get it in there.

DR. ULSH: So we'll cover that point. Now in terms of things being different, I think that -- I mean there were a couple of events that happened around '69 and '70. One was certainly the fire. The other was the switch-over from NTA film to neutron TLDs. And I think op--

well, operations were certainly transferred out of the buildings affected by the fire. That was 776 and 777. But carrying forward into the future even past '76 -- you know, up into the post-'77 era, those were essentially accomplished. I mean those aren't expected to change. So I -- I don't know, Arjun, if -- if we're talking about different action items here. I mean in terms of we -- we committed to, in the '50s at least --

DR. MAKHIJANI: Yes.

DR. ULSH: -- doing the spot check. Have I -- have I accurately described --

DR. MAKHIJANI: No -- yes. No, that's accurate.

DR. ULSH: That's okay.

DR. MAKHIJANI: That's what was committed to. I don't think there was an action item with respect to '70 to '76 in the last call.

DR. ULSH: Right.

DR. MAKHIJANI: But this kind of has come to my mind, reading your explanation for the back extrapolation of having some hesitation about (unintelligible).

DR. MAURO: This is John Mauro. I'm listening

to the discussion, and we are here mainly because we're concerned about the SEC more than we are about the site profile. Is that correct? Is that general-- I mean that's --

UNIDENTIFIED: Correct.

DR. MAURO: And what I'm -- what I'm listening to right now is a conversation that sounds more like a site profile conversation than an SEC. What I'd be very interested in -- certainly discussing how to de-convolute and extrapolate has great value because if you could resolve that, you have resolved the SEC issue.

But let's say we can't resolve that to the level of precision that we would like because of these uncertainties and incompleteness of data sets. I'd like to hear a little bit about okay, what's the fall-back position that -- is there a way to say well, we could place a plausible upper bound. Given the limitations of the available data and knowledge of process -- process knowledge, what was going on in different times periods, is there a general agreement that -- or not -- that it's possible to place a plausible upper bound on what the neutron-to-photon ratio may have been in a

given time period or location. The reason I ask that question, because I -- and I think it goes to the heart of why we're here, if -- if there is general consensus -- let's say we hear from Ron yes, we're working -- I saw a number here of .41 for certain -- .429 as a neutron-to-photon ratio, and it sounds like there maybe some discussion how do you validate that, how do you make sure you got it right. And then I would say okay, let's say we can't make sure we got it right because there's always going to be a little bit of fuzziness around the edges. Is there a way we can get to a point where someone say okay, granted that we're -- we're sort of stuck with this uncertainty, can we put a number on that, and everyone would say yeah, that's certainly a plausible upper bound -- and re-- and reasonable. So I guess I just -- seeing where -- if that subject has value around this table today.

DR. ULSH: I think it does, John. I'm going to take a risk here because I'm not an expert in neutron dosimetry, but let's talk about that '70 to '76 time period. We've got a penetrating value. We know that part of that

is a gamma dose, part of it might be neutron for some -- you know, for some workers that's a reasonable thing. At worst -- and I'm not proposing this as a strategy, but at worst, could we not say -- let's say you've got a -- I'm making a number up -- a two-rem penetrating dose. At worst could you say assign two rem gamma, assign two rem neutron -- double counting. You know that that's an upper -- an overestimate, but you know you've bounded the dose.

DR. MAURO: My reaction to that was I think we also have an obligation that it has to be plausible. So there may -- so I mean you're on the -- and in my mind you're on the right trail because we -- we put the thing in a box and maybe -- so I am -- you know, I am looking at things a little bit differently than the conversation. Is there a way we could put this problem in a box and everyone would agree yeah. It's not inconceivable -- 'cause I don't -- I don't know because we've been through this before where we assigned things that were scientifically not plausible, and -- and we can't go down that route. It's still got to be

scientifically plausible, but at the same time everyone agrees that it's an upper bound. And that approach you just described might very well be that. In my mind, I -- to the extent to which we can do -- accomplish both in a meeting like this where we're talking in terms of how do we validate the specific values you've set forth and that would solve all problems, but if -- if there's go-- but that seems to be a protracted process and that may turn out to be something that's going to be hard to do between now and September. But maybe this other thing I'm talking about is something we could do pretty quickly, and then all of a sudden that becomes -- that -- and all of a sudden we're at least (unintelligible) -- and if we agree on that before September, what we've got is, okay -- like we've done in other cases -- we don't have an SEC issue here, and it's -- and that -- that's always very helpful if -- if our main objective is SEC.

I've said my piece.

DR. ULSH: I agree with you.

MR. GRIFFON: Yeah, I -- I agree with -- I -- I agree with the -- I agree with the concept. I

-- I think we have to -- we've been down that path before, as you said --

DR. MAURO: Absolutely.

MR. GRIFFON: -- where we can -- we can't just throw a high number at the wall and say --

DR. MAURO: That's right. I agree with that, too. Yeah.

MR. GRIFFON: -- all right, that's not good enough, make it a little higher --

MR. FITZGERALD: But my understanding -- you're -- you're talking about -- you know, the difference between -- what we're trying to do right now is validate the existing model for the early years versus perhaps looking at plan B, which is an upper bound. But it seems like we getting to a point where you ought to be able to provide some validation -- a *coup de grâce* I think you called it the last time -- and I think that would pretty much re-- provide the reassurance we're talking -- I -- I don't see us being that far away and it sounds like that -- after the conference call I felt we were much closer and being very specific about what needed to be done. I think Roger was going to nail that. So I thought we were a lot

closer than having to maybe go to plan B right now.

DR. ULSH: I agree. I agree. I was operating on your premise here.

DR. MAURO: Good, we're on the one-yard line on this -- on nailing this thing, then let's finish this up, put it to bed, because it sounds like -- if we're that close. But at the same time I think it's always important to keep (unintelligible) listen. If it looks like things are unfolding in a way where we can't quite get there and get a touchdown on this, then there are other (unintelligible) --

MR. FITZGERALD: Yeah, I do -- I think I do agree, though. I think we're -- and not as much in SEC space as trying to provide the validation that would put -- put the thing to bed. I don't think we're really talking about not being able to do it. I think it's --

DR. ULSH: Yeah, we're discussing which numbers are appropriate --

MR. FITZGERALD: Right.

DR. ULSH: -- rather than is there a number that's appropriate.

MR. FITZGERALD: And that's probably something

to keep in mind as we go through this, that we're really more in site profile space, in terms of just making sure the Ts are crossed. But the -- the problem I think I saw was, without the validation, you're -- I think we're shaky on the early years and I think that's what -- that's kind of where we left it on the last call, that there was some uncertainty about that that could be settled.

DR. ULSH: I agree with you. There is certainly a degree of assumption, educated assumptions in back-extrapolating -- always. And so that was, you know, my -- the language -- those few paragraphs that I sent over. This is why we assumed this. But it is -- at its root, it is an assumption. And I agree with you. I think that if we can go back and do a spot-check for those few workers where we do have both gamma and neutron, that might provide a comfort level.

MR. FITZGERALD: And for those who were in the Y-12 discussions on the SEC, I think this is reminiscent of the early '50 issue where we're talking about needing to spot-check and validate '52, '53 -- but you know, the back-

extrapolation itself I think was felt not to be an SEC -- so it's I think very analogous from that standpoint.

MS. MUNN: Yeah, it is very similar -- this is Wanda. I -- I had thought when I saw the five items that were listed at the end of the neutron call notes that were sent out that it was looking as thought the actions were pretty clearly defined and that we really and truly were just about where we needed to be. It's just a matter of -- of identifying specifics and -- but I couldn't hear enough of our discussion that was going on there in the room to be clear as to whether or not we're backing off from those five specific action items and back into -- into negotiations about what to do or not. Am I -- I misinterpreting what I thought I heard?

DR. ULSH: Wanda, I don't think we're backing off. I think --

MR. GRIFFON: No.

DR. ULSH: -- we're just reaffirming that -- that indeed these action items that we've set forth are how we want to pursue this.

MR. GRIFFON: Yeah, I think we have agreement

on the actions, Wanda. We'll try to speak up, too. I apologize.

DR. ULSH: Sorry.

MS. MUNN: Okay, thank you.

MR. GRIFFON: The -- the only -- I don't know if there's an additional action from what John was saying, which is, you know, should NIOSH propose sort of this back-up approach or -- I -- I --

DR. ULSH: I don't know, I don't think we're -- I mean I think it is worthwhile to --

MR. GRIFFON: Right, right --

DR. ULSH: -- ask that question, John. At worst, are we talking about an SEC or a TBD issue.

MR. GRIFFON: Right, right.

DR. ULSH: I propose to you that at worst we're talking about a TBD-type issue. Now it's always dangerous to shoot from the cuff, and I just kind of threw this out here, this --

MR. GRIFFON: Yeah.

DR. ULSH: -- but I don't think -- I mean, in ans-- to my mind, I don't think it could be worse than a factor of two. I mean double-counting. But --

MR. GRIFFON: Well, that -- that --
DR. ULSH: -- I don't --
MR. GRIFFON: Yeah.
DR. ULSH: -- I'm not proposing that.
MR. GRIFFON: And you shouldn't. I'm stopping you from throwing that out there because I'll -- I mean I'll tell you why and Jim Neton will tell you why, too. I mean if you're going to go down that path, plausible does come into play.
DR. ULSH: I know.
MR. GRIFFON: And if you start saying well, we just can't get this right so we're going to double everybody's neutron dose, then you're going to say well, wait a second, these administrative workers were unlikely to have -- you know, you've got --
DR. ULSH: Yeah.
MR. GRIFFON: -- to determine areas and -- you know, I mean it's got to be reasonable so --
DR. ULSH: I agree. I agree. I don't think we're --
MR. GRIFFON: -- if that is a back-up, at least come with -- with some defensible models for who -- who gets which --

DR. ULSH: Who gets it and who doesn't.
MR. GRIFFON: -- approach when, you know.
DR. ULSH: Yeah.
MR. GRIFFON: Yeah.
MS. MUNN: That still puts us back in the process of misleading people about what -- what we're doing and what's real.
MR. GRIFFON: Yeah, exactly, we don't want to like over-- assign these very high doses to people that we know weren't even in neutron areas. Right? So...
DR. ULSH: Yeah, it would be typical of what we do in other issues like this in dose reconstruction. If we know where they are, we can assign the appropriate one. If we are unsure about where they are, we just go claimant-favorable on it.
MR. GRIFFON: But I think we're -- so we're --
MR. FITZGERALD: Yeah, I think --
MR. GRIFFON: -- the actions that are in that memo are still on the table and --
MR. FITZGERALD: Well, in addition, if there's any possibility of -- and I don't think this would take a lot of work, but just to identify if there's any benchmarks in the mid-'50s to

late '50s and the mid-'70s that might be neutron or photon benchmarks. If nothing else it'll calibrate the model and provide this reassurance I think that Ron was referring to.

DR. ULSH: We'll check it out.

MR. FITZGERALD: I think for the '70s --

MR. GRIFFON: Confirmatory data, yeah.

MR. FITZGERALD: Yeah, I think for the '70s it should be -- I would be surprised if it wasn't available. Now '50s, I'm not sure about, that might be --

DR. ULSH: Yeah, we'll check it out. And Joe, there might be something like -- like that in the NDRP already, I don't know. I'll have to check on that -- for the -- for the NDRP years. Now '70 to '76, that's not covered by the NDRP.

MR. FITZGERALD: Right.

DR. ULSH: And I'll see -- you know, I'll talk to the team and see if they know of anything like that.

DR. MAKHIJANI: I agree that the five action items are the ones and were the general tenor of the discussion. I just had a -- the reason I -- I (unintelligible) with this 1970 to '76 question was -- I don't know what the process

for commenting on the materials we've recently received from Brant and so I was just trying to -- because I had happened to read it, I was making a comment on that as -- well, specifically, since so many facilities were destroyed in the fire that were not usable, the -- well, let me pose a question to Roger. Were there sort of makeshift facilities and while the new equipment was being put into place where the production work continued in the interim, or did production work stop?

UNIDENTIFIED: Yes, there was some.

DR. MAKHIJANI: And my question really relates to that -- when I saw the back-extrapolation discussion, I was comfortable with the idea that once the new equipment was put into place, you can certainly back extrapolate that nothing new was going on. But I have a specific concern in relation to any makeshift equipment, the recovery operations, and whether the neutron-to-photon ratios from the '77 period onward can be back-extrapolated to that group of workers, and I have some degree of discomfort with that idea. And -- and I think that -- I had not thought about that before.

It just came to my mind because there was a very clear statement that you can back extrapolate because everything was the same, technically. And it seemed to me that that's -- I don't know, I -- it's a question for Roger, who -- who was there.

MR. FALK: The -- the answer is that the -- that the activities in Buildings 76 and 77, which was the metal working and the assembly area for the product, were never -- were -- were -- were not resumed in Buildings 76 and 77. What they were doing -- actually Building 707 was in the process of being constructed as -- I -- I -- and what happened was is that they stopped the metal-working processes until they could get Building 707 operations to the point where those operations could be transferred. I do not know precisely when Building 707 did start to become operational, but probably in 1970.

DR. MAKHIJANI: Well, then that question would be answered, that there were no makeshift type operations that would have been different.

MR. FALK: None that I know of at Rocky Flats.

DR. MAKHIJANI: Fair enough.

MR. GRIFFON: Okay.
MS. MUNN: At some earlier point in our discussions, someone who was expert -- I can't remember who -- made the statement that there were no production operations during that period following the fire until the new building was ready. That was -- that statement was made at some point in our previous discussions.
MR. BUCHANAN: Yes, this is Ron. Yeah, I remember, that was made in reference to the '69-'70 data, one explanation why the doses were lower --
MS. MUNN: Right.
MR. BUCHANAN: -- had a lot of zeroes during that time is because the production was -- plutonium production was stopped during that period.
MS. MUNN: Yeah, that's what I remembered.
DR. MAKHIJANI: Then that's -- that would take care of it.
MR. GRIFFON: Okay. So I think where we stand is the existing action's in that memo and the possibility that you may propose another model, if necessary, not as --

DR. ULSH: If we can't come to agreement.
MR. GRIFFON: -- as needed, right, yeah, yeah.
DR. ULSH: But I think we will.
MR. GRIFFON: I mean keeping in mind that main goal is to answer the SEC question as quickly as possible. That's the driver here.
MR. BUCHANAN: Did we include in that action item to try to validate a couple of points in the '50s --
MR. GRIFFON: Yes.
MR. BUCHANAN: -- and in the '70s?
MR. FITZGERALD: The benchmarks for that --
MR. GRIFFON: That's sort of a new one -- yeah, the benchmarks.
DR. ULSH: Yeah, that's --
MR. GRIFFON: Check for --
DR. ULSH: -- number five in the meeting minutes, Ron --
MR. GRIFFON: Okay, so --
DR. ULSH: -- I think.
MR. GRIFFON: You see that different than --
MR. FITZGERALD: Oh, no, no, I --
MR. GRIFFON: -- number five or --
MR. FITZGERALD: -- I think that's a little different. I think this is a reaction to your

most recent memo.

DR. ULSH: Oh, right, right, we're going to look for --

MR. FITZGERALD: See if we --

DR. ULSH: -- measured neutron-to-photon ratios.

MR. FITZGERALD: Right, neutron-to-photon benchmarks in the '50s and '70s. It's a little different than what was (unintelligible) --

MR. GRIFFON: One a-- one additional one there, yeah.

MR. FITZGERALD: Yeah, but related.

MR. GRIFFON: All right. Anything more on this TIB-58?

MR. FITZGERALD: No, I think we spent a good amount of time on the conference call --

MR. GRIFFON: Yeah.

MR. FITZGERALD: -- on a lot of these issues so I think that helped.

OTHER RADIONUCLIDES

MR. GRIFFON: All right, if everybody's ready, I think we'll go to other radionuclides.

DR. ULSH: Starring Mel Chew.

MR. GRIFFON: Starring Mel Chew, yeah.

MR. CHEW: I was going to be ready to talk

about the fire, then you caught me by surprise here.

MR. GRIFFON: Yeah.

MR. CHEW: Not a problem. Yes, sir. Were there some -- any questions, because we had like an explanation. Were there some -- any issues that -- that --

MR. GRIFFON: Really the -- the -- I think there's two primary questions that I have, maybe other people have -- you know, one, we -- we had asked for that -- sort of that overview that you gave to be consolidated in a non-classified form, if possible --

MR. CHEW: Uh-huh.

MR. GRIFFON: -- and I don't think we've -- we've had that product yet.

DR. ULSH: Not yet.

MR. GRIFFON: So I don't know if that's in the works or if it's a --

MR. CHEW: Yes, we can --

MR. GRIFFON: -- classification review problem or what -- what -- you know, if that could be made available. That was one question.

MR. CHEW: What that -- Brant and I chatted yesterday. We -- we -- the consolidation of

what we found in the MDA in total can be -- still described as being very -- still sensitive. There are a couple of isotopes that are still considered (unintelligible) sensitive information here. We do have the information and I think (unintelligible) was going to -- say you that -- speak up a little bit?

DR. ULSH: Yeah, please.

MR. GRIFFON: Yeah.

MR. CHEW: Okay. We were going to ask me to show it to you directly, off-line, on this discussion here. And so I do have the matrix is what you were looking for.

MR. GRIFFON: Okay.

MR. CHEW: That would list the findings, the chronology by year and by isotope. I think that's what you were really looking for.

MR. GRIFFON: But it's problematic posting it is what you're saying?

MR. CHEW: I think so, too. I think there'll be -- I mean without going through -- when you put all the information together, I would consider the statement still looks -- could be -- I don't want to violate any classification issues and so it could be still sensitive. And

without having someone actually review it from -- a set of eyes that could recognize what the issues are.

MR. GRIFFON: Okay. But -- but it wasn't reviewed since the last meeting.

MR. CHEW: No, it has not been.

MR. GRIFFON: That was my understanding was you were going to try to see if you could put it out there and I thought --

DR. ULSH: Well, we've --

MR. GRIFFON: -- that would involve a review --

DR. ULSH: We've got the write-up that is the written version of what Mel presented at the last working group meeting, and it does contain some generalized numbers --

MR. GRIFFON: Yeah.

DR. ULSH: -- that we're pretty comfortable, I think --

MR. CHEW: Uh-huh.

DR. ULSH: -- right, Mel?

MR. CHEW: That's very true.

DR. ULSH: Now if you want to see more detail, Mark -- I mean I know you have a clearance and -- and --

MR. GRIFFON: Yeah, yeah.

DR. ULSH: -- so does Mel, so he can show you the detail. But I don't think we want to put that in the --

MR. GRIFFON: But the generalized numbers can be made available --

MR. CHEW: Yes.

MR. GRIFFON: -- openly?

MR. CHEW: Yes, sir.

MR. GRIFFON: Okay.

DR. ULSH: Yeah, I think so.

MR. GRIFFON: I mean I think I -- we might be interested in both, but at least the generalized information I think would be good.

MR. CHEW: Yes.

DR. ULSH: We're very --

MR. GRIFFON: We can't share classified information here anyway, even if it's on the side.

DR. ULSH: Right, right.

MR. CHEW: That's very true.

DR. ULSH: We're very near to putting that write-up out, we're just putting the finishing touches on it right now.

MR. GRIFFON: Okay.

MS. MUNN: This is referring back to our

original matrix issue number 29, is it?

MR. GRIFFON: That -- I'm not working from the matrix, but --

DR. ULSH: Hold on, I got the matrix; let me look.

MR. GRIFFON: -- I'll trust you on that, Wanda.

MS. MUNN: Do you remember, Mel?

DR. ULSH: Yes -- yes, it is number 29.

MR. GRIFFON: Right, yes, number 29. So -- okay, so we'll wait and --

MR. CHEW: Were there any specific questions that -- after our -- our discussions at the last working group that you'd like to ask?

MR. GRIFFON: I think it was more -- I think you presented it and I think --

MR. CHEW: Uh-huh.

MR. GRIFFON: -- either I'd have to look back at the transcript or get (unintelligible) --

MR. FITZGERALD: The leading -- leading question I was giving you at the time, and I think there was some hesitation because of these -- this issue -- to get into maybe what other nuclides --

MR. CHEW: Oh, that's right, I was (unintelligible).

MR. GRIFFON: Right.

MR. FITZGERALD: -- because we're coming across references in log books to some of these other sources and -- and, you know, there's enough anecdotal information to suggest they were present, so it would be helpful just to confirm that.

MR. CHEW: Okay. Okay.

MR. GRIFFON: What I'm -- what I might propose is that if we can get this summary form before the next Board meeting -- we're going to have a subcommittee on the first day of the next Board meeting --

MR. CHEW: Sure.

MR. GRIFFON: -- if we can have that out, something that you're not worried about posting --

DR. ULSH: I'm going to put Mel on the spot. I think we can get it within a week. Right?

MR. CHEW: Yes, sir.

MR. GRIFFON: Okay, good. Good.

MR. CHEW: It's available. It's basically done, Mark.

MR. GRIFFON: Right, right, right.

MR. CHEW: We'll make sure -- and it will be

appropriate, too.

MR. GRIFFON: And then what I was going to say is if we --

MR. ELLIOTT: I'm sorry. In a week you're promising this document. Does this document have to go through classification review?

DR. ULSH: No.

MR. CHEW: No.

MR. ELLIOTT: It does not? Okay.

MR. GRIFFON: This is the one he's comfortable not having to do that.

MR. ELLIOTT: That's based upon Mel's opinion, though.

MR. GRIFFON: Oh.

MR. CHEW: Well, that is true.

MR. ELLIOTT: And I want to be doubly sure, not that I doubt Mel's opinion --

MR. GRIFFON: Yeah.

MR. ELLIOTT: -- but you know, anything that goes up on the web site, we run a great risk.

MR. GRIFFON: Well, I was -- I was asking by the Board meeting, so maybe hedge on your --

DR. ULSH: Okay, we'll put that hedge on there.

MR. GRIFFON: -- time line a little bit, you know.

MR. ELLIOTT: We'll get it to you as soon --
MR. GRIFFON: Yeah.
MR. ELLIOTT: -- as we possibly can, with -- with confidence that we're not going to divulge --
MR. GRIFFON: I agree. I agree, yeah, we don't want to --
MR. ELLIOTT: -- information.
MR. GRIFFON: -- go down that path.
DR. MAURO: This is John Mauro. By way of process, let's say once we do get it in place -- a chronology of different radionuclides and their role, their quantities, where they were -- what do you envision as being okay, now that we have that, how do we bring that issue to closure. Other words, all right, now -- let's say we know -- I know in the past there was some intuitive sense -- intuitive sense that when there were quantities that were in the gram range -- we were talking about I guess thorium at the time, at some other site --
MR. CHEW: Californium and, you know, some of the -- yeah.
DR. MAURO: -- and we'd say -- and everyone said --

MR. CHEW: Curium.
DR. MAURO: -- you know, don't worry about that. Well, when they were in the kilogram range or greater, multiple kilograms, are we in a similar situation -- that is, we're really in step one, let's first characterize what's there, how much, and then we -- we come up with a strategy for achieving closure on whether or not these are an SEC issue, these are dosimetric -- of dosimetric concern; and if so, then we'd have to answer the question how do we reconstruct the doses to people who may have handled that. How far down the road have we gotten --
MR. GRIFFON: I --
DR. MAURO: -- in talking about that?
MR. GRIFFON: I feel like I'm in step one. I hope that NIOSH is in the final steps --
DR. MAURO: Yeah, okay.
MR. GRIFFON: -- you know.
DR. MAURO: Because you know why? We are --
MR. GRIFFON: (Unintelligible), you know.
DR. MAURO: What I think is important here is that in the process of doing this we're laying out a path, a path that's going to serve us --

not only here, but in every other one that we encounter because we keep encountering these issues.

MR. GRIFFON: Right.

DR. MAURO: And I -- and I think that -- you know, we're ac-- we're actually inventing a process now that allows us to come to closure, whether it's -- whether it's an SEC closure process or it's a site profile closure process, though. I know the extent to which we're thinking in those terms -- you know, while we're gathering the data, also at the same time thinking in terms of okay, what are we going to do with it once we get it and how do we distinguish between what we're going to do to bring this to closure as an SEC issue and what we think we might need to do to bring it to closure as a site profile issue. Other words, basically think -- thinking a little bit more globally and putting something like that in place, and then that's going to serve us well for every other one that's going to be coming down the line.

MR. GRIFFON: And that's -- that's my -- my second question really was, you know, the --

the how and the who. You also have the question of who was exposed or potentially exposed and -- and how are you going to reconstruct their dose --

DR. MAURO: Exactly.

MR. GRIFFON: -- and --

DR. ULSH: Actually --

MR. GRIFFON: -- we've had this discussion a little bit with there is gross alpha data available over different time periods for different buildings. I think that all has to come together, at least for SC&A and the workgroup -- you know, I'm sure those that are closer to it, you know, understand how it fits together better, I would hope, but --

DR. ULSH: The document -- the document that you're going to get, Mark, as soon as Mel and I agree on the final form -- and Bryce -- is basically going to present our -- our evaluation that there was simply not a significant exposure potential for a number of these radionuclides. I don't -- let me see which ones, Mel.

MR. CHEW: Curium, californium, example. There were -- not only the quantity, but because of

the way -- there was a process and this -- I spent more time last time discussing what they did with the material, and I think John's -- the question is correctly now is there any potential for exposure or were -- there was any incidences reported with those potentials there. And secondly, if the material was -- happened to be in pure form, you know, was there a -- how, for instance, if any incident did occur, dose reconstruction could be accomplished. I think we're going to try to include that -- that kind of discussion here. Example, if you've got Pu isotopes that are not normally weapons grade plutonium, it would still look like plutonium.

MR. GRIFFON: Right.

MR. CHEW: Uranium-233 will still look like uranium, and things like this, and we'll use that kind of analogy.

MR. FITZGERALD: But go -- go -- going back to what Mark was saying, though, and even what John is pointing out, it almost seems like you do have a -- a model or an approach on this thing, and one is how much of it do you have; is there enough to even be concerned about it.

And then was it -- you know, was it monitored for. I mean was there a monitoring program in place, and if so, who was monitored and who might have been potentially exposed. And that kind of then leads you to the answer as to, you know, does -- does the current -- current approach in terms of the internal and external dose assessment accommodate these nuclides or not. If they don't, then you sort of get into the situation we got into at Y-12 with well, okay, can you in fact come up with a way to do that or not. And if not, then you're in SEC space. And I'm glad you mentioned that point because I think Los Alamos -- I'll mention that word -- is going to lead us into a lot of those issues and --

MR. CHEW: That's next.

MR. FITZGERALD: -- certainly -- yeah, next -- with Rocky, we're picking up references in the log books that point to nuclide constituencies that we frankly didn't see in the site profile, we didn't know existed. And now I think the way to reconcile that is to see this material balance and say okay, we're seeing references, this is kind of odd. Are you picking this up

in the materials balance; and if so, can we then nail that down a little better because clearly people were being monitored for some of these constituencies back in the '50s and '60s. Something was going on. I'm not going to mention them because I'm not sure now whether some of it's sensitive or not -- not classified, sensitive, but what does it mean. Can we put it to rest as being insignificant. They monitored, and appropriately so. The results are reasonable and there's a way to envelope that dose estimation process, and if that's all the case, then we're all -- we're fine, within the bounds. If we're not in any of those case, and more than we thought, they didn't monitor or they didn't monitor everyone they should have monitored, then we're in that space where we have to establish the SEC.

MR. CHEW: We tried to frame the description of -- the kind -- the level of processing, and not necessarily have to identify individuals, but --

MR. FITZGERALD: Right.

MR. CHEW: -- make class of groups of people -- may -- could be a chemist, you know, working on

a very unusual isotope that's alloying in for a tracer for a specific test and that will be a very limited set, and we'll try to identify it. You know, I'd like to clarify if we talk about the -- you know, where people monitored. You know, in -- in those situations, you know, unless there was a -- an episodic incident, you know, that the person just be happening to handle that particular pouring and he spilled it, you know. Well, he'd be chastised for spilling it, in the first place, because he'd lost a very valuable material. But unless that did happen, he probably most likely would not have been monitored. Okay? So I don't -- want to make sure that we clarify that just because some isotope has been identified inside of a box, unless there was some reason for that to be monitored, that may not necessarily have happened because those operations were not considered routine. It was really more of a R&D or one-of-a-kind kind of operation, so I want to make sure that we --

MR. FITZGERALD: But -- but I was also going to add, though, I think there are a couple of cases where it wasn't necessarily routine. I

mean it was in fact something that was a routine enough operation --

MR. CHEW: Sure.

MR. FITZGERALD: -- where they apparently put a bioassay program in place for a short --

MR. CHEW: Sure.

MR. FITZGERALD: -- time period. So it was something that was coming through -- a campaign almost --

MR. CHEW: Sure.

MR. FITZGERALD: -- that was maybe six months a year. They put the monitoring in place, campaign was over, apparently that was it. So --

MR. CHEW: I'm working very closely with Gene Potter, who has got the HIS-20 information, and when I bring up these particular isotope, I ask for -- you know, and since I know approximately the year based on the MDA or --

MR. FITZGERALD: Right.

MR. CHEW: -- what, I also see (unintelligible), and ask him what kind of a -- a monitor, and then monitoring was done, if any, and if there was, a example of a bioassay result or some result, either a lung count --

conceivably can relate back to either routine monitoring or an episode, and then try to minimize that --

MR. FITZGERALD: Or an --

MR. CHEW: -- or try to have that discussion.

MR. FITZGERALD: -- operational campaign where they ran something through, which they did frequently in the '50s and '60s.

MR. CHEW: We'll try to include that discussion and detail.

MR. GRIFFON: That's reassuring that it's going to be in the same document so we'll move that along a little further. As John was saying, we won't -- we're not doing (unintelligible).

MR. CHEW: We'll try to put the exotics kind of all in one question to answer the question -- but you're right, the bottom line is -- is if there are issues to -- regarding to potential exposure, can that be addressed properly by the dose reconstruction. I think that's the real -- that's the real question.

MR. GRIFFON: And the other -- the other thought I had was that in -- in addition to getting this hopefully by the Advisory Board meeting in Nevada, I'm just wondering if -- if

we saw that in advance of the meeting and we decided there might be a need to see some of the classified data --

MR. CHEW: Okay.

MR. GRIFFON: -- then we're in Nevada where we can probably get a classified room --

MR. CHEW: Check --

MR. GRIFFON: -- you know, have -- late in the evening or earl-- you know, early evening and pull out the people that can go and, you know, do it there. I mean that's -- that's -- we'd have to schedule that ahead of time, but (unintelligible) -- so that -- you know.

MR. CHEW: We can do that.

MR. GRIFFON: We'll try to alert you if we look at this and say you know what, we really want to see the whole thing and --

MR. CHEW: Sure.

MR. GRIFFON: -- you know.

DR. MAKHIJANI: Mel, you said that, you know, some -- for some radionuclides, people may have been working but would have been monitored only if there was an incident because it was felt that maybe there was no reason to monitor them. And in that -- you know, the -- that -- the

call -- I mean was it a subjective judgment that there was no exposure potential, is it technically demonstrable -- say if you have a sealed source, for example, I think it's technically demonstrable that unless you have an incident, they don't have internal exposure potential. And -- and we went through this in Y-12, not -- it -- clearly if there was material being processed, say under a hood, I -- I would be uncomfortable with a judgment that's subjective that said I don't think there's exposure potential because there was adequate ventilation, you know, some -- a general statement like that that's more or less hypothetical about the state of ventilation, the (unintelligible) whether the operating procedures were being followed. We know operating procedures are not always followed. So the question of exposure potential I -- I think, as we're going through, it would be very helpful if we know where -- where there was a subjective judgment that there was no exposure potential, but there could have been if operating procedures weren't followed or the materials being processed where it was being

done in a glove box or under a hood, or where there was really no exposure potential because of the technical reality of the situation. I think that -- that is very helpful because otherwise it becomes very difficult. You're in this place where you don't know the meaning of unmonitored, and that's -- we're going to come to that when we discuss TIB-38 is how do we establish that unmonitored people had no or low exposure potential.

MR. CHEW: I understand your question. This is something that we face every day in operating plutonium -- of facilities of high-hazard materials, especially when you're dealing with more -- more unusual isotopes and you're doing what Joe said, a campaign, one of a kind. And you're right, you know, you set up a monitoring program because you're going to handle a small milli-- few milligrams of curium, you know, and -- and the answer is probably, you know -- I don't think you're going to find that we're going to see a piece of paper that says, you know, I've analyzed, you know, what they're going to be doing there and there is no exposure potential there so we're not going to

monitor them. I don't think you're going to find that kind of data. At least I'm not familiar with that.

DR. MAKHIJANI: I'm not looking for that.

MR. CHEW: Okay.

DR. MAKHIJANI: You know, I think what -- what I'm looking for is -- and maybe this is where Mark's, you know, review of -- in a classified setting might come in is a review of what was done. And if some -- some -- if there's no piece of paper from the time, then a review of what was done to establish -- now, in retrospect, because a lot of situations -- you know, we had this discussion with Y-12 at length that --

MR. CHEW: I remember.

DR. MAKHIJANI: -- people were not monitored -- right, people were not monitored without their not had serious exposure potential, but -- and maybe we still have a difference of opinion about this, but we concluded that they were trying their best, and sometimes they actually succeeded in identifying people who were not at risk and sometimes they didn't. So they didn't monitor people who were at risk, and then they

eventually did monitor people who were at risk because they late identified who was at risk, some -- and we have -- they went the other way, too. They monitored people who were not at risk and then took them off monitor. And I think that in light of that experience, we can't trust the judgment that was made at the time, outside of -- outside of some kind of evaluation that this is not important in dose reconstruction.

MR. ELLIOTT: I think that's reasonable, Arjun, but I -- I think -- and I agree, we need to pick that up and examine it. And what forms the answer that we're seeking here is was that potential exposure a heavy contributor to dose, would that potential exposure drive a best-estimate over the 50 percent mark, 'cause it certainly perhaps won't do it for the overestimate approach and it's not necessary for an underestimate approach. So I think, you know, as we -- as we take these things up and look at them, I agree with you. I think that's a reasonable approach and we need to consider them, but consider them in the light of what they're going to be used for.

DR. MAKHIJANI: I completely agree, and that's the -- that's -- I think the point of my remark is the judgment of the time was made for one purpose. It was not anticipated then that you would be doing today what we're doing. And so we have -- we have to examine that judgment in light of what we're actually doing with the information. So I -- I completely agree with you.

MR. CHEW: I think I understand your -- your issue, your question, and we'll try to characterize that for you. I understand your concern. We'll try to -- try to identify as close as we can what we do know about those kinds of operations and what kind of judgment of monitoring necessary. I think that's where we are now.

MR. GRIFFON: And to -- to the extent you can -- I mean I don't know that we can get much more in this conversation without seeing the document, but to the extent you can, you're going to include the where, possibly the who -- and when I say the who, I'm talking was it -- was it ten workers in a lab, was it likely hundreds of workers, you know.

MR. ELLIOTT: Via job titles.

MR. GRIFFON: Yeah, or --

MR. ELLIOTT: You can characterize the type of work that experienced the expo-- potential for the exposures.

MR. GRIFFON: Yeah.

MR. CHEW: Okay, we've had a chance to talk to --

MR. GRIFFON: To the extent you can include those things, that would be -- that would be very helpful.

MR. CHEW: We've had a chance to talk to -- like Ed Vevjoda, who was very much involved with some of the special materials that was handled, and discuss that kind of an issue. So yeah, we were not anticipating (unintelligible), which is the discussion we were -- you know, we'd like to know ourselves and to get (unintelligible).

MR. ELLIOTT: At the risk of taking us too far on this, but I can feel the need to again draw us back on making sure we deliver a report that does not divulge national security information. And when we combine facts of -- such as location or building and certain types of

material, we find ourselves in trouble. So that's what we need to do is really be careful here.

MR. GRIFFON: I think I understand that avenue very well.

Okay, anything else on the other radionuclides? I think mainly we're waiting for the deliverable and have a richer discussion after that, I'm sure.

DR. ULSH: Just a quick clarification. I think Wanda was asking which matrix item this is, and I think it's --

MR. GRIFFON: 29.

DR. ULSH: -- 29, but it's also 35.

MR. GRIFFON: Oh, is it -- okay. It's continued into (unintelligible).

DR. ULSH: So Wanda, 29 and 35.

MR. GRIFFON: Yes, you're right, you're right, 29 and 35. Okay.

DR. MAURO: Say, Mark, I'd like to mention something which is a little off-line, but relevant. I'm noticing that the -- what you -- what you're doing is a narrative approach to issue resolution and sort of separating ourselves, at least for the time being, from

the matrix. I would just like to say that I -- I like it. In other words, it allows a flow of ideas that coalesce together and are much easier to discuss, and then later, after we go through this process --

MR. GRIFFON: That's what I (unintelligible).

DR. MAURO: -- we hook into the -- the matrix and try to track it. I bring this up because it's the very same question that came up recently on Savannah River. We had a conference call recently and we sort of came to the same judgment you came to independently. We like the idea of the narrative, and this seems to be working very well.

MR. GRIFFON: Yeah. The matrix serves its purpose, but I think for --

DR. MAURO: Yes.

MR. GRIFFON: -- these discussions it's better to get the main ideas out. Right?

All right, you want -- want to take a five-minute break or something?

DR. WADE: We're going to break for five minutes, which could stretch to six or seven.

MR. GRIFFON: Yeah, probably ten minutes, realistically. All right.

(Whereupon, a recess was taken from 10:45 a.m. to 11:00 a.m.)

DR. WADE: Okay, this is the -- the conference room. We're back. Two items, one of administrative importance, one of personal importance to me.

I would ask everyone to mute their phones if they're not speaking.

The personal importance to me is I'm a grandfather for the first time, so I get my granddaughter's name on the record. Margaret Wade was born last night and that's our first grandchild.

MR. GRIFFON: Congratulations.

MS. MUNN: Congratulations, that's wonderful.

DR. WADE: I got her name on the court reporter record. Okay.

INTERNAL COWORKER MODEL/TIB-38

MR. GRIFFON: All right. I think we'll go -- I think we're done with other radionuclides. Is that agreed? The fourth item I had on my schedule here was the internal coworker model and this focuses on OTIB-38. Again, I think that was part of the discussion on that meeting between NIOSH and SC&A the other day, or a week

ago or whenever that occurred.

DR. ULSH: Actually -- actually, Mark, I don't think it was. That was --

MR. GRIFFON: Oh, you -- oh, you didn't discuss that one?

DR. ULSH: No, that was --

MR. GRIFFON: Okay, I'm sorry, I'm sorry.

DR. ULSH: No, that was done (unintelligible).

MR. GRIFFON: Okay. So -- well, then OTIB-38 is the internal coworker model, and I think there's a couple of ways in which this comes up. One is the -- certainly just the coworker model aspect of it, but the other part is I think there's some -- some certain things where this is going to overlap a little bit into the data integrity question, you know, so --

MR. FITZGERALD: Right.

MR. GRIFFON: -- but I think we'll focus on the coworker model here, and try to capture those data integrity issues --

MR. FITZGERALD: Yeah.

MR. GRIFFON: -- and then in the next section --

MR. FITZGERALD: (Unintelligible) other facets.

MR. GRIFFON: Okay, so I'll let Joe --

MR. FITZGERALD: Yeah, just as a little background -- of course we did get OTIB-38 and 58 both to review. Ron, as we just noted, took a look at 58 and Joyce, who's on the phone, has been taking a look at the internal coworker model as well. So this review has been going on for about a month or two. And we did mention it in the last conference call, but only just to see if we could get the OTIB-38 expert available for this discussion more than anything else, 'cause we're not really quite ready. We have as many questions as we have analyses to offer and we thought at this point it'd be better to have a good discussion of it and make sure that we -- we understood what we were looking at and we're clear on that.
And it does have a number of different facets, and I think Arjun's been involved a lot from the standpoint of crosswalking it, so I think what we'd like to do is just maybe -- since Arjun probably spent more time thinking about the broader picture and Joyce has been getting into I think the very specifics of the model and how it's used, maybe have Arjun provide a overview to sort of tee up the broader issue,

then maybe give Joyce an opportunity to, you know, provide some of the specific questions that we have and some of the concerns, and then maybe start the discussion that way.

DR. MAKHIJANI: Okay. You have to excuse me, Joyce, or jump in if I make any mistakes. Let's see, the -- let me just -- give me a minute to open my notes here.

(Pause)

Well, first -- the first question that arises is who -- who -- who was -- well, the first question is who was unmonitored, so I alluded to this before -- before the break, and that arises specifically in a question of the coworker model, TIB-38, as NIOSH has made a statement that unmonitored workers would be less exposed than the highest reading you have available for bioassay in the various categories. And that's -- appears at the present to be not a validated or demonstrated judgment. And we took a look at the problem of how you -- you know, whether there was documentation at the time as to who was monitored and who was not monitored, and whether the unmonitored can be regarded as part

of the same statistical distribution as the monitored workers.

I -- Joyce and I -- and I think Mark also -- looked at -- at the data, and actually the available data don't even fit into a sensible distribution, and so there's a question of where the unmonitored workers might belong and whether you can apply the available data in some scientifically-defensible way to the unmonitored workers.

So that's a sort of a big question and demonstrating that they belong in that group -- somewhere in the group of monitored workers, whether they're related to the highest exposed or somewhere in the median, is a technical job, did they work -- you know, what were the job types, what were the radionuclides they worked with and so on. I think that -- that's a -- looks like an issue that hasn't been settled.

The -- the other issue with the data, that the model is constructed in relation to reporting levels, and there are lots of questions about the relationship of the reporting level to the MDA. The MDA is a calculated MDA because in the '50s they didn't do MDA so you calculated

them. The lots of data that are non-zero values below the reporting level, and it seems that -- say the reporting level is .88, those values will be taken as .88 dpm for 24 hours, but that isn't actually put in as part of the distribution, so there's -- there's a lot of technical questions that may or may not be -- that -- that simply relate to how -- how a coworker model should be constructed. Tentatively at least it was Joyce's conclusion that doing things in relation to the reporting level, with so many non-zero values -- in many cases, a majority of non-zero values -- being below the reporting level and with an uncertain relationship of the reporting level to the MDA did not -- did not -- was scientifically questionable, at least, and we -- at this stage, let's just put it that way. So it didn't look like the coworker model was on -- was on solid scientific ground in that regard. And then looking -- looking at the data -- I lost my summary. Looking at the data, a few other questions came up is that we didn't find some of the high values from the log books in the HIS-20 database. But as Mark mentioned,

we'll cover that later.
The -- where's the rest of my summary.
MR. GRIFFON: It does raise the question of the representativeness of the coworker model, too, so if there was any -- you know, if that turns out to be a problem, then it also affects the coworker model.
MS. BRACKETT: Well, I'd just like to point out that we used the CEDR database, not the HIS-20, and I'm not certain --
MR. GRIFFON: Yes -- that's Liz Brackett -- yeah, and we -- we -- we went through these convolutions as well, Liz. There's also a question on that, Li--
MS. BRACKETT: Right.
MR. GRIFFON: -- you know, just a question of how, for a given year, CEDR has more values than HIS-20. HIS-20 -- it's my recollection, at least in these meetings, HIS-20 has always been sort of expressed as the database of record, and I assume-- I assumed, and maybe -- obviously wrongly so, that CEDR was extracted from HIS-20. And then I was confused on how HIS-- how CEDR had more values in certain years, certain time periods, than HIS-20. If

anything, I would think it would have less, but it has more. Do you know -- have you looked at that or...

MS. BRACKETT: We have someone looking, but I was not the one who did that.

MR. GRIFFON: Yeah. And I remember there was an analysis provided on comparing HIS-20 and CEDR.

MS. BRACKETT: Right, and I thought in general for internal they were pretty similar. I thought that was the -- the conclusion was that they were -- there was very little difference between them.

MR. GRIFFON: The conclusion -- yeah, I think the conclusion was that the distributions were similar enough --

MS. BRACKETT: Yeah.

MR. GRIFFON: -- to not have to re-do the model based on HIS-20. But --

UNIDENTIFIED: I felt that, too, Mark.

MR. GRIFFON: Anyway, let's just lay these out now and then we'll --

MR. FITZGERALD: Right.

MR. GRIFFON: -- review (unintelligible) --

MS. BRACKETT: Okay, sorry, I just -- I wasn't

sure if, you know, there might be a slight difference between them.

MR. GRIFFON: Agreed, yeah.

MS. MUNN: My memory was that we had put that to bed. I -- I thought we'd agreed that there were enough similarities that it wasn't a problem.

MR. GRIFFON: My --

MS. BRACKETT: I thought that was the case, too, but I just wanted to point out, since it was said that the data were taken from HIS-20, when we in fact used CEDR for -- for the coworker. I just wanted to make that (unintelligible).

MS. MUNN: Yeah, but I thought we had -- had gotten comfortable with the relationship between CEDR and HIS-20, to the point where it had been my memory that we pretty much agreed that what we looked -- what you had looked at, Mark, and what others had looked at, found that there were very few dissimilarities, that they were close enough to be -- the few -- few dissimilarities were not of major import. We're -- we're still looking at that?

MR. GRIFFON: Yeah, we're -- we're still -- I

mean we -- we got a response from NIOSH, Wanda, you're correct. I think it was one that we got right before our workgroup meeting, as is most often the case. But I don't know that SC&A ever re-- you know, analyzed the response --

MS. MUNN: Mmm.

MR. GRIFFON: -- so -- and the -- you know, the reason this comes up is I think it was part of -- of going down this path of the data integrity as well, and again, I -- and maybe I'm wrong on this, but I think HIS-20 has usually been presented in -- in our recent discussions on data integrity, as the sort of database of record. And I talked --

MS. MUNN: I thought that was why we were looking -- checking it against CEDR, to identify that there were very few if any dissimilarities or -- or holes between --

MR. GRIFFON: Well, there -- there are dissimilarities, that's -- that's what I'm saying. And -- and I think NIOSH's analysis was basically saying that there might be dissimilarities, but the effect on the annual intakes projected from a CEDR model -- a model based on CEDR data versus a model based on HIS-

20 was not going to be greatly different. I think that was kind of the conclusion.

MS. MUNN: Yeah, that's what I thought.

MR. GRIFFON: And -- and that's -- you know, but -- but again, I don't think SC&A looked at that. We -- but they did -- NIOSH did present that and gave it to us. But you know, the other way this comes up for me is the fact that, you know, in going through some -- actually I came about this in sort of the back door, which was looking at these log books and comparing against the HIS-20 database as a means to say okay, you know, the data looks reliable, the relia-- data reliability question. And in doing that, it -- it strikes me that I -- I assumed I guess that HIS-20 was the database of record and that's -- that's why I'm saying it doesn't make sense to me now that CEDR would have less values. I'm still not -- I'm not at a point where I would say that it likely would affect the -- the analysis provided before, that just -- the coworker distributions may actually yield the same product, but it does raise this other question which I -- you know, I suggest is a bigger

discussion and our next topic, which is the data reliability. You know, why were these values not in the HIS-20 database.

MS. MUNN: So do I understand correctly that what you're specifically asking for is an agreement of some kind from SC&A? Or you're -- you're relying on SC&A's interpretation of whether the data is reliable enough. Is that...

MR. GRIFFON: No, I --

MS. MUNN: I guess I'm confused as to what we want -- what the next step is, what's wanted.

MR. GRIFFON: Well, why don't you -- why don't you hear -- hear SC&A out first, and I'm not sure I know the next step, but all I'm saying is there's two parts of the issue. One is the coworker model, which we've heard again and again is not very much relied on in the Rocky Flats claims. And then the other part of that is the -- the data integrity itself.

MS. MUNN: Okay.

MR. GRIFFON: All right?

MR. FITZGERALD: Right, and --

MR. GRIFFON: So just bear with us for a few minutes.

MR. FITZGERALD: Right, and again, this is a analysis in progress and we came up with, again, more questions that we felt would be useful to discuss at this table now before presenting a written piece on this, and that's the purpose of just trying to set the stage. Unless you have anything else, Arjun. I don't know if Joyce --

DR. MAKHIJANI: Well, what -- what -- what -- yeah, why doesn't Joyce pick it up from here. Maybe I can (unintelligible).

MR. FITZGERALD: Yeah.

DR. MAKHIJANI: I think -- I think Joyce has a more --

DR. LIPSZTEIN: Okay.

DR. MAKHIJANI: -- yeah, detailed grasp of what she has written than I do, so...

DR. LIPSZTEIN: Okay. Should I start?

MR. GRIFFON: Yeah, go ahead, Joyce.

DR. LIPSZTEIN: Okay. From the pattern of the HIS-20 and the CEDR database, the CEDR database has more data than the HIS-20 database. And what was presented by the NIOSH is that they knew that -- that really for some years the CEDR has more data than the HIS-20, most of the

years they have it, some years the HIS-20 has more data. And they say that most of the data that is -- the different is mostly from people that were -- that the zero doses, that's more on the CEDR and then the --

MR. GRIFFON: What kind of dose, Joyce?

DR. LIPSZTEIN: Zero, zero. Zero, most of the zero.

MR. GRIFFON: Zero, okay.

DR. LIPSZTEIN: Yeah, yes. And then the CEDR database was used on the coworker model and -- okay. And then on the revision on the -- review of -- NIOSH review of this application evaluation report, there is a whole chapter -- whole section seven on the credibility and consistent of the Rocky Flat dosimetry data, and then all the comparison is done -- were based on the HIS-20 database as the primary source of the data. So that's one of our (unintelligible) is how come the CEDR database has more data than the primary source, which is the HIS-20. And then it says that the HIS-20 was compared with original hard copy records for a number of individuals, and they say there is no evidence of systematic errors. I'm

reading from the SEC petition evaluation report by NIOSH. HIS-20 was compared with original hard copy records for a number of individuals and no evidence of systematic errors or significant difference between the HIS-20 database and the hard copy data was observed. I don't know what is this hard copy data, but the problem is that many -- not only the zero results are missing from the HIS-20 database, but a lot of high results are missing from the HIS-20 database, at least for internal dosimetry. I have reviewed some of the log books, and I have noticed, for example, from the '57 to '60 that like there were four people exposed in an incident. Only one is reported on the HIS-20 database. But they are present on the CEDR database, so my question is from where does the data from the CEDR database come from. And how can we rely on the HIS-20 database when many high activities are missing.

MS. BRACKETT: Well, I have a question then. Why do we need to rely on the HIS-20 database if we didn't use this for coworker, then why --

DR. LIPSZTEIN: I don't know that.

MS. BRACKETT: -- why (unintelligible) --

DR. LIPSZTEIN: That's what NIOSH says on the SEC petition evaluation report.

MR. GRIFFON: Well, Liz -- Liz, this does go back, and I mean it -- we are waking this issue up, to some extent, but it does go back to the -- the argument that -- you know, originally we -- we questioned why CEDR, why not the primary source, so then NIOSH offered an analysis that said well, we don't have to redo the model because basically we get the same results with CEDR versus HIS-20.

MS. BRACKETT: Uh-huh.

MR. GRIFFON: And now we're saying why -- you know, we're kind of looking at that answer again -- and maybe in more detail, I agree, but you know, we're all working real time here -- looking at that and saying wait a second, we see some -- some things that don't seem to make sense, you know, and Joyce just laid those out very well, you know, why --

MS. BRACKETT: But I guess my question, though, is why do we need to look any further at the HIS-20 database if we're not actually using it for anything.

MR. GRIFFON: Well, we're -- we're -- I mean I

-- I've been told that I can use that to -- to validate hard co-- you know, we're validating that --

DR. ULSH: Yeah, actually Liz, I think I can answer --

MS. BRACKETT: The coworker --

MR. GRIFFON: Yeah.

DR. ULSH: -- that. We used the HIS-20 -- I mean that is part of the worker's record. That is probably what we would rely on to do dose reconstruction.

MS. BRACKETT: Okay, I guess I didn't realize that the --

MR. GRIFFON: Right, so individual DRs are using that.

MS. BRACKETT: There's not -- there's not handwritten records or anything that goes in them --

DR. ULSH: Yes, there are.

MS. BRACKETT: -- because that's what the DRs would go back to.

DR. ULSH: In the early years certainly, and I don't know --

MR. GRIFFON: You're -- you're getting ahead of us, but that --

MS. BRACKETT: Sorry.
MR. GRIFFON: -- 'cause I'm coming up with those questions, but thank you, no, pursue down this path. That's fine.
DR. ULSH: In the early --
DR. LIPSZTEIN: And the --
DR. ULSH: In the early --
DR. LIPSZTEIN: And the super S also we were told to look at the HIS-20 database for the cases that were used on the super S.
MR. GRIFFON: Right, which is the first time I noticed.
DR. LIPSZTEIN: The fire -- the 1965 fire and the design cases we are told to look at the HIS-20 database for those cases.
MS. BRACKETT: Okay, I didn't realize that -- you know, I -- I guess I was just raising the question --
MR. GRIFFON: Yeah, and --
MS. BRACKETT: -- what is it being used for.
DR. ULSH: In terms of --
MR. GRIFFON: Let me -- let me try to -- and Brant, jump in if I get this wrong, but I -- the -- the case files I've reviewed, it seems like there's a combination of database printout

data and then, for the early year -- and I'm trying to get a handle on when that early years is defined. I think -- what I've seen, it's sort of -- the latest I've seen is up to '69 where you have actual bioassay card type data or -- or for-- a grid -- grid form kind of thing, yeah, where you have handwritten numbers in -- in a worksheet of sorts. But that's only, it looks to me -- I've found things in the '50s and up to as late as '69, but then after that it's all database printout data. So I was told, you know, that -- that's why we're concerned about the database. We've got to -- we want to compare that against hard copy records, and to some extent we were trying to do that with our log book analysis with the urinalysis logs are going down that path because that's what's in the individual records and that's what's being relied upon for dose reconstruction.

MS. BRACKETT: Right.

MR. GRIFFON: Does that make sense --

DR. ULSH: I agree, Mark. I mean I -- it matches my experience, too, that you see their handwritten cards up to maybe '69, don't hold

me to that but that's about right, I think. I think I recall presenting at the Denver Advisory Board meeting an analysis -- a comparison of hard copy versus HIS-20 data. That was part of --

MR. GRIFFON: Yeah, and we -- I think -- what -- what we're now asking maybe is maybe we need a little clarification of what you meant when you said hard copy. Was it database printout data, was it this six-- you know, know these early card data, and you may have laid that out specifically, but we may have not understood it at that time so that might be part of --

DR. ULSH: Craig Little performed that. Unfortunately, he's in Tuscany -- right, Tuscany? Unfortunately for me. But our recollection -- Bob Meyer and I -- is that he looked at card data.

MR. GRIFFON: Card data. So when you say hard copy data it's -- it's --

DR. ULSH: It's those things you're talking about up to '69, the handwritten, compared to HIS-20.

MR. GRIFFON: Right.

MR. MEYER: That's correct.

MR. GRIFFON: All right. But you gave -- I mean you have several -- I'd have to look back at Craig's report, but he gave -- I think he also compared the other data, too. Right? Or was it only the card data?

DR. ULSH: I don't know that I can say it was only the card data. It was at least the card data. There might be other pieces. I'd have to look back, too, Mark.

MR. MEYER: (Off microphone) I think (unintelligible) got into the other comparison in his --

MS. MUNN: My understanding at the time in Denver was that it was card data.

DR. ULSH: Yeah.

MR. GRIFFON: I didn't even know that they had cards in their files when (unintelligible) Denver, so -- but...

Okay, so -- so that -- I guess that's -- I -- I think we're going on Liz's question, which is why are we looking at HIS-20. That's really the reason why we're even bothering to look. And even if it was card data, I think that probably gets us up to late '60s, then you still have some question about '70 through --

DR. ULSH: Oh, 'cause that's -- that's where we have -- you're con-- I think, now it's coming back to me a little bit, we started out with analysis between -- what was it, HIS-20 and something else, and your concern was that that's -- I think I recall you saying something like that's not really what I'm interested in; what I want to see is comparison to the hard copy record.

MR. GRIFFON: Right.

DR. ULSH: And I think that's why we -- you know, in response to that, we went back into the card data. And like you said, that only exists up through '69. After that, they were electronically recorded. So to get to your desire to see a comparison of electronic versus hard copy, that's why we did that.

MR. GRIFFON: And there might have been -- might have been some talk. I wasn't as familiar with the claims files. I took some time in the last month or so and looked at a number of them. When you were saying hard copy from the claims files, I was wondering if it was just still printouts or whatever, so --

DR. ULSH: I see.

MR. GRIFFON: -- we need to reconsider that Craig Little report. I think SC&A needs to --
MR. FITZGERALD: Take another look.
MR. GRIFFON: You know, as part of this, but --
DR. ULSH: Yeah, but that's -- that's -- that probably fits into the next action -- the next agenda item, data reliability.
MR. GRIFFON: Yeah.
DR. ULSH: But in terms of OTIB-38, the questions are --
MR. GRIFFON: Yeah.
MR. FITZGERALD: Right.
MR. GRIFFON: Joyce -- did you have anything else, Joyce?
DR. LIPSZTEIN: Not on the HIS-20 database, but I think I would like to compliment what Arjun has said about -- about OTIB-38. May I? Okay.
MR. GRIFFON: Yes, please.
DR. LIPSZTEIN: Okay. The first thing that Arjun said about it is one first question that we ask ourself -- we have to ask is who was monitored. The first thing on the coworker model is that statistical methods were used to calculate the coworker intake, assuming that the bioass-- bioassay results for

(unintelligible) that were monitored have a lognormal distribution. We accept -- let's say that we would accept that the workers have a lognormal distribution. I'm not discussing this now. We could argue about that, but let's not discuss this now. When you have a statistical design of workers that were monitored, then you have to know wherever you place the worker that was not monitored, because when you have a distribution -- a statistical distribution to represent workers, where do you place the workers with some (unintelligible) probability of selection into that sample, because if you have workers with some (unintelligible) of selection into a sample, where to place this is not a statistical decision, it's a subjective decision, and that's the main problem with the coworker distribution. You -- if you want to use the -- the coworker model as a representative statistical distribution of unmonitored workers, you have to know the probability of all the members of the target population, the people that were selected to be included in that distribution and the people

that were not selected to be put in the -- in the -- in that distribution, and we don't know that. At least NIOSH did not inform what was the criteria and what was exactly where we should put the -- the -- the unmonitored worker. We cannot say it behaved like the median or the 85 percent because we don't know. We don't know what -- what would be the probability of selection of the unmonitored worker and where he sh-- what -- where he would stay in that population. And NIOSH says on the SEC petition evaluation report that in general participation in a bioassay program involved workers who have the largest potential for exposure, but we don't know what was the real policy for Rocky Flats. On -- on the ORAU TBS-5 (sic) -- 11.5, which is the internal monitoring document, it says that in the '50s the practice of Rocky Flats was to monitor workers only if they were expected to be exposed to ten percent or more of the limit of tolerance, and later the goal was to operate at less than ten percent and (unintelligible) investigation conditions if an air sample exceeded 100 percent of the limit. So we don't

know who really was monitored and we -- we see that all this is a subjective -- was a subjective decisions. There is -- NIOSH did not provide us with any statistical or technical basis to say that the unmonitored worker would receive less dose than the most highly exposure or -- or -- or the -- or what the people that had the -- the -- I'm sorry -- that participation on the bioassay program involved only workers who had the largest potential of exposure because all of this were based on subjective decisions.

We also know from reading the log books from the early years that it had a lot of discussion on who should have been monitored and which tasks needed monitoring. So if you go through the log book you'll see that in many (unintelligible) there are a lot of discussions saying these people should be monitored -- would have been monitored -- should it monit-- that practice, should we not monitor that practice and then they had conference and things like that, and they were -- they were not sure and there were complaints with the union saying that they should be monitored and

they should not. And also if you go through the log book you would say that -- you would see that some workers that were monitored and presented high exclusion rates. Also the radiation protection people because they say all -- they have a discussion and they say we don't know, we have investigations and we find no reasons for the high urine results. So from this we can conclude that some jobs that might have presented radiation contamination risks might have been misjudged and workers might not have been monitored. So my -- my -- our first concern is on the application of this model to the unmonitored worker.

Our second problem -- so let -- let's say -- well, let's go into the model itself. When we go to the coworker model itself there is a suggested linear distribution to substitute values less than the reporting levels 'cause there were reporting levels for uranium and for plutonium at that time. But there is no real scientific value reason to be used -- to use these linear distribution. And in fact when you looked at what was done, you know, on the OTIB-0038, although it says they -- linear

distribution to substitute values less than reported levels should be used, it was not used for plutonium. Instead they used the exact values, even if they were below the reporting levels. And even the zeroes were not substituted for that linear distribution but they were substituted by the reporting level for plutonium. And for uranium NIOSH used another distribution that is not the one described -- this linear distribution that was described on OTIB-38. So I don't understand what's done and why it's presented a linear distribution that in fact was not used.

Now the third problem that we have with this coworker model is that there were many results reported below the reporting levels. And for example, there -- for plutonium, for example, there were between 76 and 80 percent of the -- eight -- even sometimes 87 percent of the positive results were below this reporting levels.

And another problem that we have is that for most of the uranium and for some of the plutonium the reporting level is below the MDA for the median conditions. So we don't know

what really these numbers mean when they are below the -- the MDA for the median con-- condition. And -- and so the problem with the MDA, it was calculated (unintelligible) not at that time, and then the MDA was calculated for the median and for the extreme conditions. So I don't know what the median MDA (unintelligible), we don't know what a reporting level below the -- the median MDA means, and we don't know why substitute the -- the zeroes for reporting levels and not by the MDA, we don't know -- we -- we need some explanation why this was done like that.

MR. ALLEN: All right, Joyce, this is Dave Allen. I think I can start this off anyway.

MS. BRACKETT: Okay, I was going to jump in 'cause I was -- been reviewing the data, but...

MR. ALLEN: Let me start it off, Liz. First of all, the TIB-38 was -- the sole purpose of that document was to analyze what data we had as far as monitored workers, determine what type of distribution. It wasn't so much as to determine who it would apply to other than unmonitored workers. And how that is applied, I believe right now would be up to the dose

reconstructors themselves based on the specifics of a case. If you get a case that is a clerical worker that says she never went into any of the plants and stayed in an administrative building, you would have one assumption, versus someone that said they was a security guard and they made routine security checks through various buildings, that would probably give you a different assumption. The whole purpose of TIB-38 was to give you the distributions of the people that were monitored, and essentially end it right there as far as that document goes.

As far as the minimum detectible activity of an analysis, that is the statistical analysis of a single sample to determine whether or not the level of that sample is truly greater than background and not a statistical anomaly with background. That's the -- essentially the purpose of an MDA. When you're analyzing a larger population of samples, the detection limit is really irrelevant for the distribution of that -- that population. What's important is the sensor level, which here is the recording level. You mentioned a .88 a few

times in the earlier years, and I think .2 in later years for plutonium. So the purpose of this was essentially to -- well, the bulk of the mathematics anyway, was to essentially determine a distribution of the urine samples for each quarter or each year, depending on how many samples we had, and then to put that into an IMBA analysis to determine the intake rates. The -- as far as the big piece of the samples being less than the recording level, and they're simply recorded as let's say less than .88, that is true. The issue is, because the bulk of your samples are recorded as less than some value, does that truly make them worthless. The idea that a large percentage of samples recorded less than some number, you know, in my opinion has a lot of worth. It tells you a lot about the distribution or about the -- the type of activity in the samples. So the technique that was used -- the technique that we tried to use anyway -- is to rank all the data, including the sensor data, to determine what percentile all the data is in, and then we fit the -- the positive data to -- essentially we are making the assumption that

it's lognormal and then fitting the recorded tail of that lognormal distribution in order to determine the parameters of that distribution. We also use a goodness of fit parameter in an attempt to verify that lognormal assumption. The problem we run into in Rocky Flats is that the .88 sensor level or recording limit --

MR. GRIFFON: Excuse me, if you're on the -- could you mute your phone if you're --

UNIDENTIFIED: That's Bryce, isn't it?

MR. CHEW: Bryce? Bryce, could you mute your -- mute your phone? I think you're -- I know you're talking on the phone with Ed. Thanks.

MR. ALLEN: Anyway, back to where I was. The .88 recording limit -- if I can remember where I was -- oh, the problem we ran into with Rocky Flats was the .88 recording limit was for routine analysis, so we had a number of samples. For most quarters you'll have, you know, some samples greater than that .88 and they're recorded whatever value they came out to be. You'll have a great deal of samples recorded as less than .88. And then you have some samples that are not routine or for some reason they wanted to record an actual value or

to get a more statistically rigorous sample of those samples -- or analysis of those samples, so you end up with some positive readings that are below that .88, such as say .5 or .4. We did not want to throw out positive data. I mean that's some of the real numbers we have rather than .88 -- or less than .88 -- and we struggled a little bit with the appropriate way to deal with that.

One way was to just rank all the positive data and put all the sensor data below, but then you end up with these .4s that are -- have a higher percentile than what's -- you know, some of these less than .88s that are probably above that. The opposite is to put all those at the other end of it and then you're going to end up, you know, with the opposite effect. You've got .4s recorded as a very low percentile when in reality some of those less than .88s are a much lower percentile. We've done these type of analysis both of those ways. The -- another method is to use a substitute value for the -- for the sensor data. It's -- it's --

DR. WADE: We do need you to mute your phone. There's all kinds of noise coming through here.

MR. RICH: I'm sorry, that wasn't me this time.
MS. MUNN: I hope that was a door slamming and not a revolver.
DR. ULSH: No angry screams from Bryce.
MR. RICH: I had it on mute before and it was...
DR. WADE: Okay, well, just -- everyone can mute if they're not speaking, please.
MR. ALLEN: One other standard -- fairly standard technique that people use in these type of situations when they have a lot of sensor data is to -- to substitute a value. Often it's half of that sensor value, so in this case .44 for those values. That gives us -- well, that -- that's three options. Then the fourth option we're talking about is this linear distribution where we put in there. That is essentially an attempt to rank these positive values, such as the .4s, et cetera, in the proper location, where they would belong in that large distribution that is less than .88. The -- one way that was thought of of doing that is to assume that all those less than .88s are lognormally distributed and -- and simply substitute a value for that set between zero

and .88 in a lognormal distribution. That's making the analysis come out to a lognormal based on your assumption. It's kind of -- you know, it's almost like cheating, you know, it's --

MR. ELLIOTT: It's compounding your assumptions.

MR. ALLEN: A decision was made to make the assumption that we simply can't make that -- we can't make that assumption and we wanted to stick with what we did know, and what we know is the value was less than .88. We made the -- what I think is a good assumption -- that the true value was greater -- or was not less than zero, and we assumed nothing else other than it was somewhere between zero and .88 and it was -- we gave equal probability all along there, which essentially is a uniform distribution -- or some people would call that the distribution of maximum ignorance -- and that's what I would like to -- that's what we did with this rather than making the assumption that it was lognormal.

MR. GRIFFON: But it seems to me -- you answered at least one of my questions, which is

what are these values less than .88 that are real values, so --

MR. ALLEN: Right.

MR. GRIFFON: -- I understand that now. But what -- why -- there's a different combinations in -- in the coworker model. Right? For uranium it looks like you went with a linear --

MR. ALLEN: Right.

MS. BRACKETT: Right, if I can speak up here --

MR. GRIFFON: -- (unintelligible) and for plutonium you have other ones -- go ahead, Liz, I'm sorry.

MS. BRACKETT: I'm sorry. I was just going to point out that we in fact did not use the linear distribution for the plutonium --

MR. GRIFFON: Right, right, right.

MS. BRACKETT: -- because the majority of the samples were not recorded as less than the recording level. We -- we only use that distribution when the vast majority of results are less than some cut-off level. And when I say vast majority, I mean 90 percent or more. And that was not the case for plutonium, so the plutonium less-than values were just ranked wherever they fell, but the actual -- no value

was actually used when the fit was performed for those. The uranium, on the other hand, we did do the substitution for many of them 'cause an awful lot of the results were less than the MDA or the -- the recording level.

DR. LIPSZTEIN: That was not exactly the same distribution as described. There was another kind of linear distribution for uranium but it is not the one that is described in OTIB-0038.

MS. BRACKETT: It should be.

DR. LIPSZTEIN: No, it isn't. I -- I checked and it's not.

MR. ALLEN: Well, we'd only -- Joyce, this is Dave again. It would only be the values that were recorded as less-than, and some of those at least were --

DR. LIPSZTEIN: I know.

MR. ALLEN: Okay.

DR. LIPSZTEIN: Yeah, exactly. I noticed that plutonium was completely different, and then for uranium it's another kind of distribution but it's not the one that is described in OTIB-0038.

MS. BRACKETT: Well, we'll have to go back and look at that then because it should be.

DR. LIPSZTEIN: Yes, please.

MR. ALLEN: Yeah, we can look at the linear -- you know, what's supposed to be the linear distribution in the uranium. And yeah, I'm aware the plutonium did not use that. The -- the length of time it just took me to describe what we did is -- kind of tells you why we tried to avoid using that. We tried to avoid substitution at all in these, but as Liz said, when we get to a point where almost all the samples are recorded as a less-than value, we had to use something.

MR. GRIFFON: And for -- for the plutonium years, it seemed to me that the point -- the .88 decade or whatever, I follow you, the .2 decade seemed to be consistent, but -- or -- it's basically replacing all zeroes with that recording limit of .2.

MR. ALLEN: No, not for plutonium.

MR. GRIFFON: No? That's what I saw, I thought.

MR. ALLEN: What they ended up doing -- well, for the plutonium urinalysis, the method that ended up being done was one of those options I gave you in the beginning, and in this

particular case it was the resource -- the positive results recorded above the recording level of course are ranked, you know, as the high samples.

MR. GRIFFON: Right.

MR. ALLEN: The positive results recorded below that were all ranked at the low end. What that ended up doing was giving us a slightly inflated values for the -- the distribution.

MR. GRIFFON: Oh, okay.

DR. MAURO: I've got a question. You know, getting to the point we're at right now, I was following the correspondence involved and saw -- number of conference calls, I -- it was my understanding that the -- the reporting level, this .88 number, dpm per 24 hours --

UNIDENTIFIED: Yeah.

DR. MAURO: -- is lower than the MDA --

DR. LIPSZTEIN: I can't hear you. Can you speak louder?

DR. MAURO: Yeah, Joy-- yeah, Joyce, this is John. Am I --

DR. LIPSZTEIN: Yes.

DR. MAURO: Am I correct that the reporting level, this .88 number that I'm hearing, is

that lower than the MDA?

DR. LIPSZTEIN: No, the --

MS. BRACKETT: No.

DR. LIPSZTEIN: -- the -- when it comes to .2 it's lower than the MDA, and the 8.8 (sic) dpm that is used for reporting level of uranium is below the median MDA, yes.

DR. MAURO: So is -- so now -- let me -- just -- I -- it's a simple question. If -- if the reporting level is in fact lower than the median MDA, then in my mind the reporting level is a metric that has no meaning. Other words, you know, if you're saying well -- well, we selected a reporting level, but if the MDA is above it, it's the MDA that is at play here where -- that we should be looking at. Why are we even looking at a reporting level and somehow keying in on that as a -- as a -- as a meaningful number if it's below the MDA?

MR. ALLEN: Well, that -- that's why I mentioned that first. The MDA is only a value that's worthwhile for a single analysis. In the analysis of a population the detection limit is really irrelevant. The only thing that's relevant in this analysis would be the

sensor level, and that would be what level you recorded values at and what level do you simply record them as some kind of less-than value. In fact, if you were to take a -- a large number of blank samples and run analysis on it, it would be a legitimate statistical analysis of what the background's doing in determining what your MDA is, so the MDA itself on analyzing the population is not a relevant number really.

DR. LIPSZTEIN: I don't agree with you. I think -- and NIOSH even has used that, and I don't agree with the way NIOSH is using the MDA 'cause it's taking the median MDA from a population and dividing it by two to assign it for people that had the zero levels.

Let me -- let me point this out. You -- NIOSH has presented us with a DR example of how to deal with -- how they would deal with the data. This DR example is a worker who for two year was not monitored, and then after that he was monitored for I think four years, I don't recall exactly how many years, but had zero results for his monitoring. And what does NIOSH -- the way NIOSH is resolving this

example is that it's assigning to this hypothetical worker, for the time he was not monitored, the coworker model for uranium. And for the four years after which he was monitored, the zero results was -- was calculated the missed dose based on the median MDA divided by two. So I don't know why this difference. I don't know why the zero results in one place is -- you assign a value that is equal or -- to the 8.8 -- to the reporting level -- 'cause we're talking for uranium, the DR example's for uranium -- which is below the -- the median detection level and then when he has zero results in his records, then you assign to him the median MDA divided by two, which doesn't make any sense also. It's not consistent the way the zeroes are treated all through.

MR. ALLEN: I think we're mixing up the concepts here. I mean I'm not saying MDA is always worthless. I'm saying MDA's associated with a single analysis. When you're doing --

DR. LIPSZTEIN: Oh, yes, I agree, and it will be different from analysis to analysis.

MR. ALLEN: Right, but I mean --

DR. LIPSZTEIN: But if you --
MR. ALLEN: What you're doing with the sample is what's important. If you're talking two or three samples from an individual, then you have to consider the detection limit on it. If you want to determine the distribution of a -- a large population of samples, the MDA of those individual samples aren't what's important. It's what the recorded value is. That's kind of two different issues.
DR. LIPSZTEIN: No -- no, because there was no -- the MDA was not -- from that time was not calculated at that time. I would agree with you if there was a calculation of MDA at that time. The MDA was calculated now, based on the background and of the time of counting on the (unintelligible) of the detectors at that time.
MR. ALLEN: Right, but that is to determine what the true value or what the sensitivity of that single analysis was.
DR. MAKHIJANI: I think -- I think --
MR. ALLEN: Are we -- are we talking two different times here?
DR. MAKHIJANI: Yeah, I -- let -- let me try. Put yourself back -- back in the '50s and

forget the calculated MDA. The procedure that was being used at the time had some detection limit, even though it was not calculated. It had.

MR. ALLEN: Sure.

DR. MAKHIJANI: There was -- there was a blank that above some level that blank would be considered contaminated. That result -- none of these things were calculated at the time, but there was a physical reality of the blanks and samples that were being measured.

Now if you have -- if you had the real MDA at ten, and your result came out at five or four or three, what is the meaning of that result? It has no particular meaning.

MR. ALLEN: On an individual basis.

DR. MAKHIJANI: No. If -- if all your results came out below the MDA and you don't know -- and your MDA is ten, that's the only statement that you can make if all -- all the results are below the MDA.

MR. ALLEN: No, that's not true. If you were to take say 100 blank samples and run them through your analysis and record the values, you can get values like one, two, negative two,

various numbers.

DR. MAKHIJANI: Yes.

MR. ALLEN: If the laws of statistics work out, the average should end up being zero.

DR. MAKHIJANI: Uh-huh, that's right.

MR. ALLEN: And you can determine a distribution about those blank samples. If we sampled everybody at Rocky Flats -- you know, a thousand different samples -- and before the plant started up, you get a thousand urine samples and nobody's been exposed to plutonium, hopefully those urinalyses are going to come out, on average, to be zero and you can determine a statistical distribution about those samples.

DR. MAKHIJANI: Yes.

MR. ALLEN: That's all we're doing, what is the statistical distribution of the samples is all we're doing, whether they're positive, negative or whatever. The only issue you have is what to do with values that are recorded less than some recording level -- the sensor data. That's the only thing important in that type of analysis. Now when you want to use a single sample to determine an intake, then the

detection limit is very important. But to determine the distribution of a set of samples, the detection limit is not important.

DR. MAKHIJANI: No, no, if -- if you analyze a set of blanks and you come up with the aver-- and it has a normal distribution, you come up with an average value of zero, you can say with some confidence that this is an uncontaminated set of samples. But if -- if --

MR. ALLEN: But -- just -- just to catch that real quick. You can say that if you know your average is zero and what your standard deviation is.

UNIDENTIFIED: Uh-huh.

MR. ALLEN: Right?

DR. MAKHIJANI: No, if --

MR. ALLEN: That's what we're doing is determining those parameters for that distribution.

DR. MAKHIJANI: But you can't make a sensible statement about the standard deviation if you don't know your detection limits.

MR. ALLEN: You have to know the standard deviation in order to determine the detection limit. You're getting the cart before the

horse here.

DR. MAKHIJANI: But -- but --

MR. ALLEN: You can determine detection limits from a distribution of blank samples.

DR. LIPSZTEIN: But what Arjun is saying is that if you -- if you had -- even if you had a distribution where the median detection limit was such-and-such and the -- the detection limit for extreme condition, as NIOSH has calculated, is such-and-such, how do you know that the zero is because it's below 8.8 or because it's below the -- the MDA, the detection limit? How -- why do you (unintelligible) the zeroes by the -- the reporting level instead of (unintelligible) it for the -- the MDA. Why -- why does the zero signify it's below the -- the reporting level, not below the detection limit of that sample?

MR. ALLEN: Well, when you have a zero recorded -- if -- if you had --

DR. LIPSZTEIN: Yes, when you have a zero recorded.

MR. ALLEN: If -- if you had all values recorded, nothing was recorded as zero, nothing was recorded as less than some number, then you

would have no sensor data, you could determine a distribution of that population even if all of it was below the sensitivity of the analysis, and that's how you would determine MDA -- or one method you could use to determine MDA.

As far as zero, like I said, the only question here then is sensor data and what that zero means.

UNIDENTIFIED: Uh-huh.

MR. ALLEN: And from --

DR. LIPSZTEIN: Yes.

MR. ALLEN: -- all the information from the site and from -- I don't remember the exact years, I think '52 to around '62, the zero was recorded if it was less than .88, after that it was recorded if it was less than .2, and after the second quarter of 1970 it was recorded as-is.

DR. LIPSZTEIN: Yeah, but that's not -- but how do you know that someone got zero because it was a number below the -- the reporting level and not because they found zero because they could not detect?

MR. ALLEN: Well, again, I think what -- we're

mixing up the concepts here. For the TIB-38 distribution, all we're trying to determine is that distribution. And then what you were talking about before, about actually analyzing someone's intake from their individual urinalysis, then you have to -- yes, you have to worry about the detection limit --

DR. LIPSZTEIN: No, no, no, no --

MR. ALLEN: -- and what that really means.

DR. LIPSZTEIN: -- you are doing a distribution where you have substituted all the zeroes by a linear distribution around the .8 -- around the 8.8, that's what you say you did -- you didn't do exactly like that for uranium, but that's what you say. You have substituted all the zeroes by a linear distribution around the 8.8 detection -- reporting level.

MR. ALLEN: Yes.

DR. LIPSZTEIN: So first of all, there is -- I -- I don't know what's the scientific reason for substituting the zeroes by this linear distribution. And second of all, how do you know that this is the best statistical distribution for -- for a zeroes when the -- with -- even when the reporting level is

probably below the detection limit of the -- of the technique at that time.

MR. ALLEN: Well, I think that was two questions. The -- as far as how do we know lognormal is a decent assumption, I think was in there --

DR. LIPSZTEIN: No, no, no, no, I'm not talking about --

MR. GRIFFON: Linear -- I think it's linear.

DR. LIPSZTEIN: -- lognormal. I'm off of --

MR. ALLEN: Oh.

DR. LIPSZTEIN: -- the positive lognormal. I'm talking about these linear distribution. You are substituting all the zeroes by a linear distribution whose maximum is the reporting level.

MR. ALLEN: Right, and I explained that a little bit earlier. Basically that that's -- that's because we didn't want -- we didn't have a rigorous statistical analysis to say that every population of urinalysis is lognormally distributed, even though we got some decent information indicating that, and I think a lot of people that have seen that essentially believe that. The linear distribution -- we

just didn't want to make that assumption, so we assumed equal probability for the whole range, zero to the recording level, and that gives us a slightly --

DR. LIPSZTEIN: That's right.

MR. ALLEN: -- favorable distribution than if we had assumed it was lognormal.

DR. LIPSZTEIN: No, I don't know, I think this is arbitrary. There's no real statistical decision on that. I -- I don't know why, first of all. Second, I don't know what any of this zeroes means because they were below the median detection level at the time so I don't know what any of the zeroes means on that distribution, and I don't think this is a real -- you know, the way to treat data below the -- the -- the -- that could be below the detection level is (unintelligible) but there are many statistical ways to -- to treat it, but it's not sufficient to think the zeroes for a linear distribution by the maximum value is your reporting level.

MR. ALLEN: Right, there are many ways to treat it, and one of the standard techniques is to substitute half of the recording level, and

that's a slightly less favorable --

DR. LIPSZTEIN: That's not -- that -- now that's not the standard. That's the first time NIOSH uses it and doesn't apply it to plutonium and --

MR. ALLEN: No, NIOSH did not invent that.

DR. LIPSZTEIN: -- and -- and also -- also there's no statistical justification, nothing. It's just arbitrary.

MR. ALLEN: No, NIOSH did not invent that. There's several papers out there, but there is no consensus on how to deal with --

DR. LIPSZTEIN: I -- I -- I didn't see any paper on that. I -- I see paper using Bayesian distributions, Bayesian methods to treat data, but never saw that.

MR. ALLEN: Well, the -- the idea of fitting the positive values above the recording limit -- using all the data to determine the percentiles and then fitting only that, gives you the same answer as the maximum likelihood method would give you. It's only a question of dealing with them when you have positives that are below that recording limit is where we had some issues, and we took essentially a

favorable approach to it.

DR. LIPSZTEIN: Let me tell you, I would like to see something written about the basis for using that, not just putting like that, a linear distribution was used. I would like to see it (unintelligible) statistical methods we are right because it's -- it's claimant favorable, because anything. I even accept things that are not exactly statistically perfect, but they are very claimant favorable. Okay, that's -- like -- like the super S model. It's not a model itself, but it envelopes everything, it's claimant favorable, it's okay. I don't see anything claimant favorable justified here. It's just putting here, we use that linear distribution. In fact, it's not exactly the one that was used for uranium and there's no justification for that and there's nothing about the (unintelligible) of this was the MDA, so I don't know what the zeroes mean. So I would like to -- you know, NIOSH to do that, to justify for me why this was used and a reason for its use, if it's just to show me that it's claimant favorable and -- and to show me that it doesn't have any conflict with the

MDA.

MR. GRIFFON: And another -- another part of this, just to -- to break off your conversation here, is -- I think what we have to think about now also is -- is there's -- several issues have been laid out, some of which I think are more -- some I think could -- could impact our SEC decision process, but some may not and -- and you know, may be TBD issues rather than SEC issues. We may still have some critiquing of the -- the approach to modeling, but you know, can a plausible upper bound be, you know, identified for coworker models, may-- you know, I'm just saying there may be two sets of issues that -- that might help us in getting through this, at least for the SEC concerns. We need to focus on those that have to be dealt with for SEC and maybe we can put aside some of these other, you know, concerns.

John, you were doing a draft while we were --

DR. MAURO: Yeah, I got -- I got caught up in this.

MR. ALLEN: You got caught up in it.

DR. MAURO: I got caught up in this, and I -- and I -- see, I look at things very simply, and

-- and during all these meetings, we've had lots of conference calls, and we had out statisticians aboard and I've seen curves and critical values and MDAs, and I said oh, my God, I'm getting a headache. Okay? Let me -- I'm looking at it from a common sense point of view. Let's say someone came over to me and says John, I've got myself 10,000 measurements of urine -- okay? -- dpm for 24 hours, got a whole bunch of them for a bunch of workers that worked at a given time period. Okay? During that very same time period -- I'm not going to change the time period. Let's say it's a ten-year period. I've got some solid data. Okay? This is real -- just simple stuff. So okay, good, I've got data. But there's a whole bunch of guys that have got numbers that are -- are some -- are suspect. That is, I know damned well if I'm above -- let's say -- I'm using .88, I think that's your critical value --

MR. ALLEN: Recording level for plutonium.

DR. MAURO: -- the reporting level. I don't care what the number is.

MR. ALLEN: Early on.

DR. MAURO: There's some number that if we all

got together and we said you know, if it's more than this number, it's real. This guy's got some plutonium or this guy's got some uranium. I don't want to quibble whether it's the MDA or it's the reporting level or it's a critical value. It's almost like a -- and my understanding is, we go back far enough in time, didn't even have these equations for what an MDA is. Other words, there was some judgment made -- hell, we got a hit here, or no, we don't, it's kind of -- so let's say just for now we could all agree that there's some number and dpm for 24 hours that if you're above that, it's real. If you're below that, we don't -- really don't know if a guy got exposed or not. And let's say we could agree on that. For now let's -- I just picked these .88 for -- now, and I go in and I plot, and I say okay, either -- my -- either percentage or a cumulative distribution -- other words, no one got more than that. Other words, I've got 10,000 workers. Out of the whole 10,000 workers, no one got more than that. Okay? And then -- and then -- and then I just keep plotting. I get a cumulative distribution and

so I say okay -- and -- and this is what I know is true. That is, here's my distribution for those workers that says this is what -- this is how things were. No one got more than that, and as far as we can tell, people -- this is the lowest positive value we saw. And about -- let's say 20 percent of the population, or some number, either 20 percent -- or absolute number, doesn't matter what this axis is. It could be an absolute number or it could be a percent of the population.

Then after that, we don't know what the heck's going on. There may be 1,000 workers that are in here somewhere. Okay? They're in here somewhere. We don't know, anywhere between zero and .88, we don't know. Okay? And along comes a worker and we get his records, we look at his records and we say it's less than .88, which means that we don't know what it -- I'm going to argue this. Now statisticians and very -- you know, may -- may disagree with me, but as far as I'm concerned, I don't know. He may have gotten zero, he may have gotten something just below eight, but I don't know. What do I do with him? Okay, so what I say is

well, what do you do with him? You say well, the reality is he's in here someplace. If you -- you know for sure he's not more than that. Well, if you want to be claimant favorable -- okay? -- you say well, you give him that. Okay? You want to make sure you don't underestimate because this is -- if he's measured, this is if he's measured. Okay? So he's measured, come back -- and let's say he's measured every month -- every month, month after month after month, and every month he comes back, it's something less than that. Well, common sense tells me -- ah, the chances are, every month over ten years, he just happens to be in that .87, that's not going to happen. Okay? So I could see someone coming back and say well, common sense says well, it's sure as hell every month for ten years he didn't come in at .87. You know, probably came in at -- you know, I mean it could have been zero every month if he was in a clean environment. If we don't know anything about what he did, we can say that he -- probably someplace in here.

See, to me, common sense says well, you know

what I would do is I would pick, for this guy, over a long period of time now -- (unintelligible) was saying unless he has many, many years of experience, we've got measurements made, I'd drop him in someplace in here. Would -- at what, one-half? I mean, to me -- yeah, one-half. However, it's -- it's -- this would be for the people that you have measurements for.

Well, let's say you've got a guy, he wasn't monitored. Okay? He wasn't mon-- I mean it's -- see, to me, anyone could understand this. All right, the guy -- this -- these -- I just told you the story of the guy that's monitored. Okay? And you're -- you're coming in and I say well, as far as I'm concerned, you drop him in here somewhere.

Now if the guy is mon-- if the guy is not monitored, you say well, what do I do with him? I sure -- I -- you know, if he's not monitored, I can't drop him in here. It ain't right, unless I know for sure, based on his operating life, that he really wasn't exposed in an area where he could have gotten anything. Well, then I say to myself well, you could -- you

could either give him zero or you could drop him in here somewhere, just in case, to be claimant favorable. You -- but -- you know, if you were really confident that he wasn't likely to be exposed at that time.

But let's say he was a guy -- and say you know, he really should have been monitored. There's a time period where we didn't monitor everybody, but you know what, he probably should have been monitored because we know -- so you know what I say? You pluck off the 95th percentile, or you -- or you assign the full distribution. Me, I would pick the 95th percentile if I knew nothing about him except that he probably should have been monitored.

So notice just what happened here. Now I'm -- I'm putting something on the table. What just happened here is I didn't even mention -- except somehow we've got to agree with where are we going to dr-- cut this thing off, and I -- and I can see that whe-- this cut-off point is kind of fuzzy. You know, we've be-- there's a lot of debate regarding is it the MDL, is it the reporting level, you know, is it the critical value -- and by the way, we didn't

even talk about that, but I was talking to some of my statistics friends, there's a thing called a critical value which is less than the MDL that's also an important metric. You -- you pick a number. Now in my mind -- and I won't take up too much more, but this has been -- 'cause I've been involved in a lot of these conversations. Why can't we do something like this? And it's simple, it's understandable, it's almost common sense. Why are we over-analyzing this thing?

MR. ALLEN: We're not. I think you've -- you've pointed out the -- the difference right now. You said something about you would assign either the distribution or the 95th percentile. You cannot do that until you have the distribution.

DR. MAURO: Well, I'm saying you have the distribution, you have --

DR. LIPSZTEIN: Can you speak more loudly?

DR. ULSH: Yeah, we just got an e-mail that the microphone at this end of the table is not working real well. The one down at --

DR. LIPSZTEIN: Huh-uh.

DR. ULSH: -- Mel's end, and Mark, that's

working pretty well, but this one is not so great, so I don't know what to do about that.

MR. MEYER: And it may be it's not working at all and they're just hearing through that one.

DR. MAURO: Well, I was yelling --

DR. WADE: At lunch we'll -- at lunch we'll work on that.

DR. MAURO: But the -- you see, this is your -- you didn't -- you don't assume anything, you've got data. You've got data, and you -- you make a cumulative plot. I -- I haven't seen the time yet when I put my cumulative plot and I couldn't draw a straight line and I was pretty close to it, you know, a power function and a lognormal, every time I plot these data, the real numbers -- they look like this.

MR. ALLEN: And that is essentially what we're doing. We're fitting the tail of a distribution there to determine what that distribution is.

DR. MAURO: This part down here?

MR. ALLEN: Yeah, we're using -- we're doing just what you're doing right there -- forget the linear part right now. We're doing exactly what you're saying right there. We're fitting

only the data that's above that .88 there, it'd be the -- the uncensored data.

DR. MAURO: Uh-huh.

MR. ALLEN: We're fitting that, but we're fitting it to, you know, what percentile it is, essentially what you're talking about. If you have only ten positive samples out of a thousand, you're talking about the upper what, 99.9 percentile? If you had half of the samples were detected, then that bottom of that -- where that recording level is would be your 50th percentile. That's what we're doing.

DR. MAURO: I didn't hear that.

MR. ALLEN: Okay.

DR. MAURO: I have to say, when I read this stuff and I think about it, it's just not -- and what I'm looking at is this is not a complicated problem. But somehow it's --

MR. ALLEN: I agree.

DR. MAURO: When I read it --

MR. ELLIOTT: We would agree, yeah.

DR. MAURO: -- I say why is it so complicated. I think that what -- what I've been hearing is -- we've been talking about this. I don't think we're ever going to agree on what that

is, except if we all decide that listen, the right place to put this threshold is some place.

MR. ALLEN: But what's important here in urinalysis, if those Xs would go all the way down to say .01 --

DR. MAURO: Oh, that would be great.

MR. ALLEN: -- you would draw your line through the whole (unintelligible).

DR. MAURO: That would be great.

MR. ALLEN: So what if the analysis had a detection limit, though, of .5 -- would you use that data that's down below there if you had 1,000 points?

DR. MAURO: If -- if you're below the MDL?

MR. ALLEN: Yeah, to draw your line through the data points, would you use that data?

DR. MAURO: I guess my answer would be -- I would just extend this --

MR. ALLEN: Just to determine the distribution.

DR. MAURO: Oh, I would -- yeah, I would just keep this thing going all the way. Yeah, that's what I would do.

MR. ALLEN: That's the argument we're having here is the detection limit -- when we're

determining the parameters of this distribution, the detection limit is irrelevant.

DR. MAURO: I agree with that.

MR. ALLEN: It's only the censored level. If you had these five points you've got on the board here, and then 100 that were recorded as less than .8, you know, those 100 are censored --

DR. MAURO: Someone said they were zero, and in the report they say it's zero.

MR. ALLEN: Well, they're recorded as zero and we know that means .88 --

DR. MAURO: We know it's not zero, that means it's less than some number.

MR. ALLEN: Yeah.

DR. MAURO: And -- so what do you do --

MR. ALLEN: There's no such thing as a --

DR. MAURO: -- what do you do with that guy?

MR. ALLEN: Well, it's not so much that guy, it's just how do you analyze this -- what do you use for parameters for this distribution based on this censored data.

DR. MAURO: Yes.

MR. ALLEN: Essentially, if you've got enough,

you don't use it -- other than to determine the percentile, that I've got ten percent data recorded and I'll use that ten percent, that tail.

DR. MAURO: It sounds like that we're conceptually in agreement, but I know that Arjun and Joyce don't exactly agree with this. And I want to understand what's wrong with it.

MR. ELLIOTT: It sounds to me like our OTIB-38 doesn't introduce and explain what it's -- how we arrived at this distribution, or the distributions it's reported.

MR. GRIFFON: Well, I think it does -- it references those Procs that -- the general --

MR. ALLEN: There's a separate TIB that discusses the analysis, or the Proc, we call --

MR. GRIFFON: Is this the same model that was -- yeah.

MR. ALLEN: -- the technique.

MS. BRACKETT: Now OTIB--

MR. GRIFFON: -- (unintelligible) for Mallinckrodt and other sites -- several other sites (unintelligible).

MR. ELLIOTT: Does it go back to our Implementation Guide?

MS. BRACKETT: OTIB-19 discusses this.
MR. GRIFFON: OTIB-19. Isn't that a Proc, too?
MR. ALLEN: There --
MS. BRACKETT: Yes, 95.
MR. ALLEN: Yeah, but I think that's just the administrative, isn't it, as far as who does what?
MS. BRACKETT: No, 95 is the specific details of how to do the analysis.
MR. GRIFFON: Okay, yeah. OTIB-19 and Proc 95. Right?
MR. ELLIOTT: So -- I hear -- I hear Joyce asking for an ex-- a written explanation of this, and I think that's -- you know, if -- if it's not coming across in the -- in the introduction or the purpose of the -- of the OTIB or the supporting -- or the documents that is referenced in that, maybe we can do that for you.
MR. ALLEN: Yeah, we can -- we can summarize everything in a White Paper as far as...
MR. GRIFFON: If it's not -- I mean I think she's looked at those procedures. I'm not sure -- Joyce, if you've looked at OTIB-19 and Proc --

DR. LIPSZTEIN: Yes, yes, I did --
MR. GRIFFON: Yeah.
DR. LIPSZTEIN: -- I did, yes. Yes, I did.
MS. BRACKETT: I think that I may have figured out what the issue is with the substitute -- the linear distribution not appearing to be correct.
DR. LIPSZTEIN: Uh-huh.
MS. BRACKETT: I don't know if you have been given the actual spreadsheets that were used, because there's -- for uranium there's two sets of data basically that were merged together to do the analyses, and so they -- the two of them had different recording levels, and so a separate distribution was run for each of them, so the --
DR. LIPSZTEIN: Yes, I know, the -- the (unintelligible) the uranium had a different --
MS. BRACKETT: Yes, uh-huh.
DR. LIPSZTEIN: Yeah.
MS. BRACKETT: And so --
DR. LIPSZTEIN: I saw that.
MS. BRACKETT: So each of those -- so all of the results that were depleted uranium, they had a reporting level of 5.2, so a distribution

--

DR. LIPSZTEIN: Yes, instead of 8.8, right.

MS. BRACKETT: And so the distribution on those was run up to 5.2, and then a separate distribution was run for the samples with a reporting level of 8.8, so I don't know if you --

DR. LIPSZTEIN: I've tried that, but I couldn't -- I couldn't figure you out, though, why you had that distribution and they had many similar -- many repeated data and -- I don't think this is the most important thing, but I -- what I -- I would like to see is why does this distribution (unintelligible) unmonitored worker, why the median value represent the unmonitored worker or who of the unmonitored worker is represented by the median value of intake that was derived on -- on the -- based on the median activity, and why a linear distribution is a good substitute for zero values. Those three things I would like to see.

DR. MAURO: And I have a question, though. When -- when you have a person -- and I'm not sure what the answer is from reading the

material. When you have a person that you say should have been monitored -- now he could have been within the population of people -- let's say this is some time period and he-- and he's a member of that population during that time period when you were monitoring bioassay and you -- let-- he should have been monitored but he wasn't. Okay? What do you use? Do you go here, use the full distribution? See, in my mind, you've got no choice but to use the 95th percentile.

MR. GRIFFON: And I don't want to answer for Jim Neton, but I mean in our past meetings that's usually where he falls to (unintelligible) --

DR. MAURO: And I haven't heard that.

MR. ALLEN: And I don't want to say that 'cause I'm not positive, so I don't (unintelligible).

DR. MAURO: Okay, now I --

MR. ALLEN: But there is a difference between what we've done in the past when you have just a very sketchy set of data versus 300,000 data points, so --

MR. GRIFFON: Right, sure.

MR. ALLEN: So I mean the distribution itself

seems better to me, but it depends somewhat subjectively on what the person actually was doing.

DR. MAURO: But I'm interested in that. Other words --

MR. ALLEN: Yeah, I understand that, I just don't have an answer --

DR. MAURO: I'm almost done and I'll sit down. Let's say this is not -- this is a time period that covers a ten-year period where you have data, and now you're going to extrapolate and use it as a coworker set for some other time period. Okay? And all -- because that's all you've got, 'cause let's say in another time period they didn't have any bioassay data. It's not clear to me the criteri-- how do you -- how do you build a bridge?

MR. ALLEN: Okay, what -- what we've done and what's usually ignored in this whole analysis is the distributions and the hard core math that you've seen in all this data gives you a 50th percentile and an 84th percentile urinalysis for that quarter, and that's done for each and every quarter throughout the history of the site. And then those are

punched into IMBA as if it's this one 50th percentile person and an 84th percentile person to get intake rates that'll vary from time frame to time frame, generally a little higher in the early years and a little lower in the later years. And the 84th intake rate, divided by the 50th percentile intake rate, will give you the geometric standard deviation.

DR. MAURO: Yes.

MR. ALLEN: So we really end up getting an intake -- a distribution of intake rates based on the population of 300,000 urinalyses.

MR. GRIFFON: You really -- it really is worth going through TIB-19 and Proc 95 and walking it through -- in through IMBA and doing -- I did -- I went through that task for Mallinckrodt and it -- it explains a lot, you know. I like to work with the numbers rather than hearing words, that's just the way I work, but that -- that was instructive. I mean the question -- I have some -- just to emphasize Joyce's point, the question of -- of who is in this database is raised again, you know. If -- if -- and I think something that wasn't said earlier but we had discussed it the other day, maybe Joyce and

I and Arjun were talking on this issue, you know, it -- it -- the statement that if someone wasn't monitored they would have never been -- obviously couldn't have gotten in the 95th percentile of the database but in fact we learned through this process that, for the neutron exposures, the highest neutron building in the early years was missed on the monitoring program, so -- so it may happen. I think we need a little more evidence that that is very unlikely that that happened for the internal -- you know, for the internal side.

The other -- the other thing I was struggling with is the -- the type of measurements that are in this database. This is just kind of everything, I think, and you've got routines with specials with --

UNIDENTIFIED: Incidents.

MR. GRIFFON: -- yeah, and then in some cases on the individual spreadsheets -- Liz I'm sure is listening -- there is some high values that were censored of your model because they -- they appear to be, I don't know to the extent -- the extent to which these were investigated back, but they appear to be associated with a

large incident or something, so the high values were truncated off. But I don't see -- I'm sure there's other incidents that were lower, and oftentimes, looking in these log books, I've seen places where people were, you know, believed to have an intake. They were sent for a special. The urinalysis came out quite low, actually, and then they did like maybe two follow-ups, so you've got all their -- three specials in there in addition to a lot of routine data. You know, I -- I think it's a hodge-podge of results in here and I don't know to what extent that -- that biases it toward the null or not. That -- that's the question I've been grappling with.

MR. ALLEN: Well, the idea was to not throw out any data if you could at all avoid it. There was some -- you know, with the fires, et cetera, there are some in there that are pretty outrageous and driving a whole distribution. And when you have one very high sample at the high end, you can actually drive the geometric mean --

MR. GRIFFON: Yeah, I'm not saying it was inappropriate, I'm saying --

MR. ALLEN: -- below the data. I mean it's not necessarily favorable in that case, but the idea was just to get a distribution of all the samples, regardless of what those samples were. And if you start tossing out, you know, small incidents, et cetera, you get to the point where how -- you have to start figuring out how often can you have a small incident before that's a routine operation. Okay? And I mean in virtually every quarter you see some -- a little tail at the top there where you got some -- some higher ones, but they're used in the distribution, unless it's just an outrageous thing that really throws it off.

MR. ELLIOTT: I hear you saying --

MR. GRIFFON: I guess it's really dependent on who -- like who was monitored for different time periods. I bet it -- I bet it changed. I don't know if the policy for Rocky was always to monitor everybody for plutonium or if it was a subset in the beginning, like other sites, you know, and then they --

MR. ALLEN: Right, but this -- this distribution --

MR. GRIFFON: -- but eventually you might get

to the point where -- my point here is that your -- you know, some of the quarterly models, you get into the point where you have your 50th equaling your 84th on your -- on your --

MR. ALLEN: On just the population?

MR. GRIFFON: Yeah, on your population data, so it's like --

MR. ALLEN: Are you -- are you suggesting --

MR. GRIFFON: -- how claimant favorable is this model? You know, it's a -- it's so skewed to the zero values, if you assign the 50th for someone who was working in a -- in a --

MR. ELLIOTT: Or if you have a number of --

MR. GRIFFON: -- (unintelligible) that didn't have data then, I think you're in trouble, you know.

MR. ELLIOTT: Or if the data really had a lot of specials that turned out to be zero --

MR. GRIFFON: Right, or --

MR. ELLIOTT: -- there -- so are you suggesting, Mark, (unintelligible) --

MR. GRIFFON: (Unintelligible) just follow-up, you know, several follow-ups for one individual.

MR. ELLIOTT: Yeah, yeah, the follow-ups you

would expect to be -- you hope there's --
MR. GRIFFON: You hope they go in there. Right?
MR. ALLEN: Well, ninety -- in general, though, when you've got follow-ups, it's because you had some highs -- initial samples, so most of the incidents and most of the follow-ups tend to skew it a little higher.
MR. GRIFFON: A little higher.
MR. ALLEN: Nobody's going to do a lot of follow-ups from negative samples.
MR. GRIFFON: What I'm saying, the monitoring practices over time could skew it to zero if --
MR. ALLEN: Right, but we're getting --
MR. GRIFFON: -- start adding --
MR. ALLEN: From this we're getting --
MR. GRIFFON: -- (unintelligible) into your population that was monitored.
MR. ALLEN: Right, but from this analysis we're getting urinalysis for that quarter or whatever, so they're all associated with the same monitoring practice -- you know, assuming the practice doesn't change drastically throughout the three months, and the results of all these analysis basically gives us a data

point for each quarter throughout the history of it.

MR. GRIFFON: That's true.

MS. BRACKETT: And I don't see any years where the 84th is the same as the 50th or -- or even relatively close to it. At least -- I'm looking at plutonium right now. I'm -- I haven't looked at uranium, but --

MR. ALLEN: For that distribution, I don't think so.

MR. GRIFFON: Yeah, that may have been a uranium --

MR. ALLEN: The actual values, I mean they might have both been, you know, more than 84 percent below the recording level.

MR. GRIFFON: Yeah.

MR. ALLEN: So the -- if you look at the -- you know, the halfway point and the 84th point, you get the same number, but the distribution we derived would not have that.

MR. GRIFFON: Right.

MS. BRACKETT: But I mean -- well, right, but then that would just give you a very small GSD and we don't have any GSDs that are that small.

MR. ALLEN: Well, that's true.

MR. ELLIOTT: Well, we don't -- well, we don't assign weightings to different types of data, we have looked at these kind of issues that Mark's raising, have we not, or have we missed the boat on that? Liz, can you help me? Whoever's built a coworker model, don't we look at the contribution that the data makes to the overall model and determine whether or not it -- there's -- there's an undue influence from that source of data?

MS. BRACKETT: Well, I'm not sure what you mean by source of data.

MR. ELLIOTT: That type of data, not necessarily the source, but the type of data.

MS. BRACKETT: I still don't understand the question, I'm sorry.

MR. ELLIOTT: Do you understand my question?

MR. ALLEN: I think I understand your question. In general, no. I mean we're trying to get a distribution of the urinalysis from monitored workers, period. You know, that is the distribution we're getting. The only reason to look at what you're talking about there to evaluate individual ones would be to throw them out as an outlier because they're, you know,

associated with some major incident, and we try to avoid that. We have done that with a few that were just, you know, very skewed. Other than that, we look at the distribution and see how well it fits that assumption, that lognormal assumption. If it fits it well, we're good. If it doesn't fit it well, we do a bit of an analysis and say well, there's, you know, various small incidents associated with this that kind of skew it high a little bit and don't bother trying to, you know, go through the evaluation of tossing out these -- these higher ones.

MR. GRIFFON: I guess what -- I guess what I'd ask at this point, I -- you know, I have less concerns on the -- the model side than the data validation issues related to this. I think Joyce still has some outstanding issues. I guess I'd ask, you know, SC&A and -- and all of us to think about, of all these issues rai-- of all these concerns raised, you know, which ones are more TBD issues rather than SEC issues, you know.

MR. ELLIOTT: Yeah, I would ask for that. I'm at a loss right now to figure out this -- what

we've just been talking about, how has it become an SEC issue?

MR. GRIFFON: Yeah, I -- I guess my -- my biggest SEC issue is more on the data integrity question and I'll -- we can go into that more this afternoon, but I -- I mean I looked in the --

MR. ELLIOTT: I could see that.

MR. GRIFFON: Yeah, you know, so -- go ahead.

DR. MAKHIJANI: Mark, the first part of the question that Joyce raised, especially in relation to her log-- and correct me if I'm wrong, Joyce, and -- and maybe you should finish this. I'm just raising the point that Joyce's finding in the log books that the unmonitored workers -- internal unmonitored workers were at -- some of them may have been at high risk -- at some risk of high exposure, so -- so that the assumption that unmonitored workers were not at risk, I -- and whether they belonged in the same distribution, I think may be the one issue that is an SEC-level issue --

UNIDENTIFIED: Yes.

DR. MAKHIJANI: -- in this -- in this question of distributions and so on.

MR. ELLIOTT: Well, then we need to see -- we need to hear from you, hear from Joyce those instances where you raise that question. We need to understand what you're seeing there that we evidently have not seen.

DR. MAKHIJANI: Right.

MR. ELLIOTT: So if you could help us, we need that guidance.

DR. MAKHIJANI: Yeah, that's in process. I mean Joyce, did -- am I right about that?

DR. LIPSZTEIN: Yeah.

DR. MAKHIJANI: I -- I think the MDA reporting --

MR. ELLIOTT: Yeah, 'cause that goes to a judgment call that we're making. We're saying there is an unmonitored worker. We don't see any potential for a high internal dose exposure.

DR. MAKHIJANI: Right.

MR. ELLIOTT: And you're saying just the opposite. You're saying you see something there.

DR. ULSH: We're not saying that unmonitored workers have no exposure --

DR. LIPSZTEIN: Yeah, I'm saying that, first of

all, there was some -- on the log books you can see some discussion on who should be monitored and which practices should be monitored. So if there was some discussion, it's because people when -- did not know exactly who should be monitored and which practice would result in contamination of workers and might be a misjudge at that time.

And second, when -- there were some people that were monitored that were high results on the urine results, and then you see the health physicists, they had discussion why they had high urine results when they don't see any reason for getting that. So --

DR. ULSH: These are --

DR. LIPSZTEIN: -- again there was a judgment that that practice wouldn't result in -- in activities in urine and even though they -- they had high urine results. That means that some people that were not monitored might have been misjudged on the practice that they were doing and would not be monitored, so we don't know where to place --

MR. ELLIOTT: So -- so it's not NIOSH's judgment --

DR. LIPSZTEIN: -- the person on that coworker model.

MR. ELLIOTT: It's not NIOSH's judgment you're referring to. You're referring to the judgment of the day when the health physicist got around the results --

DR. LIPSZTEIN: Yes, yes --

MR. ELLIOTT: -- and said what --

DR. LIPSZTEIN: -- exactly, so --

MR. ELLIOTT: -- what happened here --

DR. LIPSZTEIN: -- so you have some unmonitored workers that might -- that were not monitored but might have had high results. So when you see an unmonitored worker, where do you place him in that coworker model.

DR. ULSH: So I'd like to make a request and a comment. The request is, if you're seeing this kind of a discussion in the logs, can you give us the specific citation --

MR. ELLIOTT: Yes, yes.

DR. ULSH: -- so that we can look at it and evaluate it. The comment is, we are not assuming that unmonitored workers have no exposure potential. I mean we, NIOSH, are not making that assumption. That's why we're

talking about should we assign them the 50th --
MR. ELLIOTT: Missed dose.
DR. ULSH: -- percentile or the 95th percentile, or whatever we agree that it is. In doing that we're admitting that it is possible that some unmonitored workers should have indeed been monitored. They do have exposure potential. Now --
MR. GRIFFON: And that's true, but part of your -- part of your premise and assumption on this whole model is that the most like-- the most high-- the highest exposed workers were monitored.
DR. MAURO: This is a recurring theme.
MR. GRIFFON: Yeah, it's a recurring theme. We --
DR. MAURO: And I think that when you get to the heart of it, the SEC issue lies when you have a population of workers that you think that curve could apply to, when you don't have any basis for it. In other words, if you have a group of workers that worked in a given time period when you don't have bioassay data, and we've seen this in Y-12, somehow you've got to make a case why this other group of workers

that may have been later, when you do have data, you can use it as a coworker. We -- I have -- one of the fallacies I've been -- and Arjun helped me with this -- is that well, just use the 95th percentile for the worker set that you do have numbers and apply that to the earlier set. And you're right, can't do that, because there's one more thing you've got to do. You've got to show that there is a bridge between the worker population that you do have your data for and the worker population that you don't have data for. That bridge may be air sampling data where you don't -- you -- you know, in other words, you may have air sampling data and you could show well, listen, looks like the distribution of the air sampling concentrations for uranium or plutonium pre-1961 are not all that different than post-1961 when you look at the aggregate data. But you got a hook now that says oh, okay, things weren't that different, early versus later. So I guess -- to me, the only SEC issue here is when you deci-- see, you -- we could argue from now until doomsday where this point should be and where you should pick from in the

distribution, but eventually we know we could pick an upper end value that everyone would be comfortable with. Some won't -- some won't like it because it's too conservative, but you could pick one and it would be plausible. The real problem is when you can't use that curve, that dataset that you do have, and apply it to another set of workers where you don't have any data. That's the SEC issue. And when we're at a loss to be able to build a bridge between those two populations, I think it's an SEC issue. See, it's very clear to me, but maybe not to everyone else.

MR. GRIFFON: And I -- and I think it's been argued before that for most workers at Rocky Flats you -- you're not going to rely on the coworker models. Is that -- is that --

MR. ALLEN: Right, and I think that's because the bulk of them were monitored. True?

DR. ULSH: I wish I had Al Robinson on the phone, but I don't. I tried to call him yesterday to verify that. I figured you might ask that, Mark.

MS. BRACKETT: Is Mutty Sharfi on the phone?

DR. ULSH: No, he's not.

MR. SHARFI: Yeah, I'm here.
MS. BRACKETT: I thought he was. I sent him the information a while ago. He wasn't on at the start.
DR. ULSH: So Mutty, at some point in time earlier, if -- I remember saying this at an earlier working group meeting, or maybe at the Advisory Board meeting, I made the statement that in general we -- the use of internal coworker models is pretty minimal at Rocky Flats, and I know that some number of weeks and months have passed since I said that. Is it your understanding that that is still true today?
MR. SHARFI: Yeah, it's -- I mean outside probably the few rare -- the construction worker claims that have -- that fall under the OTIB-52 rule, it's -- I don't -- I don't think we've put -- I mean at Rocky, at least, particularly, it's been pretty rare that we've actually needed coworker data for the internal part.
DR. MAURO: I was speaking to Bob Bistline and he said pre-1957 -- please correct me if I'm wrong, it was a conference call we had with Bob

on a Thursday I think it was, or a Friday -- pre-'57 there aren't any data and you've got to use the post-'57 data to reconstruct the pre-'57.

DR. ULSH: Well, now that's --

DR. MAURO: Tell me if that's correct.

DR. ULSH: That's if we're going to rely on coworker data. We have other tools at our disposal.

MS. BRACKETT: Well, that's --

MR. ALLEN: We have urinalysis all the way back.

MS. BRACKETT: Yes, that's -- the urinalysis starts in 1952.

DR. MAURO: And -- and according to Bob, the number of -- the percentage of those measurements were minuscule.

MS. BRACKETT: You're right, 1952 there's only 22 -- 26 samples. 195--

DR. MAURO: I'm sorry?

MR. GRIFFON: '52 there's how many, Liz?

MS. BRACKETT: Twenty-six.

DR. MAURO: Samples?

MS. BRACKETT: Twenty-six samples, yes.

DR. MAURO: And what percent is that?

MS. BRACKETT: Right, '53 is 492 samples -- from 140 employees; '54 is 736 samples from 165 employees; yeah and -- it -- it slowly increases up to 1957 there's 1,576 samples.

DR. MAURO: These are samples, but not people. I mean they're -- this could be like a monthly sample taken for --

MR. ALLEN: She was giving you --

MS. BRACKETT: Right, I -- I have the number of people, also. The number of employees sampled in 1957 is 439.

DR. MAURO: That was '57.

MR. GRIFFON: Liz -- Liz, do you have a spreadsheet with these statistics on it?

MS. BRACKETT: Yes, if you were given the statistics that we did, it's in there -- the spreadsheets that we used for doing the coworker --

MR. GRIFFON: Oh, yeah, so we can pull them off there.

MS. BRACKETT: There's a summary page, which I would assume you got if you got everything else. It's the summary. It lists the number of samples that were used and the number of employees per each analysis time period.

MR. GRIFFON: Yeah, so these are --
DR. MAKHIJANI: Do we know what fraction of total workers were monitored who were total production or at-risk workers were monitored, including what was considered the cold side, like the uranium side?
MS. BRACKETT: Right, I -- I don't have that information. I don't know if somebody else here would.
DR. MAKHIJANI: See, that's -- that's the critical piece.
MS. BRACKETT: Right. Right.
DR. MAKHIJANI: Purely from the numbers that you are reading, it seems to me that a minority of workers -- in some years a small minority of workers -- were monitored, because there were -- there were thousands of workers at Rocky Flats.
DR. ULSH: Liz -- wait a minute, I want to talk about that a second. '52 and '53, Liz, can you tell me how -- can you give me the numbers for those years?
MS. BRACKETT: For -- pardon me?
DR. ULSH: 1952 to 1953.
MS. BRACKETT: Somebody made a noise just --

MR. ALLEN: That was me, Liz, sorry. I've got the numbers on my screen. I'm handing them over to Brant here.

DR. ULSH: In 1952 what I see is we have 26 samples on 11 employees.

MS. BRACKETT: Yes.

DR. ULSH: In 1953 it jumps to 492 samples on 140 employees.

MR. GRIFFON: Yeah, but Arjun's point is that there were probably more than 11 people on the site.

DR. ULSH: Not in 1952. That was the construction year. They didn't start full production --

MR. GRIFFON: Maybe that was --

MR. ALLEN: '52 doesn't matter much.

MR. GRIFFON: There were more than 11 still.

DR. MAKHIJANI: I don't know the numbers.

MR. GRIFFON: Right.

DR. MAKHIJANI: I think we need to know the number of workers --

(Whereupon, Mr. Griffon, Mr. Allen, Dr. Ulsh and Dr. Makhijani spoke simultaneously.)

DR. MAKHIJANI: Including the workers that were considered to be on the cold side but where

there were radionuclides involved, because the cold side, as I understand it, in the early years was considered to be uranium and the hot side was plutonium.

MS. BRACKETT: Well, in 1953 197 people were sampled for uranium. The -- the numbers I was just giving you were for plutonium.

UNIDENTIFIED: Oh.

MS. BRACKETT: So in fact there were more people sampled for uranium in 1953 than there were for plutonium.

DR. WADE: But this shouldn't be a hard story to --

MR. GRIFFON: (Unintelligible)

DR. WADE: -- quite simple, I mean -- John's common sense approach is the right approach.

MR. GRIFFON: Okay, I think the other -- the other piece of this for me is the data validation issue, which we'll get into more after lunch, yeah, but you know, the -- the question of, you know, John's point that the upper end is fine, is fine as long as -- as -- you know, I ran across one log book for uranium which I have some concerns about with -- with the high values not being in the database --

DR. MAURO: Oh, that's a problem, yeah.
MR. GRIFFON: -- so that would obviously be a problem. But that's a data validation issue. I'm trying to separate those two.
MR. FITZGERALD: So the issue about providing some of these references in the log books would be the next discussion (unintelligible) --
MR. GRIFFON: I think so, yeah. The citations that Joyce was referencing were more sort of the HP discussions back and forth of who and -- who should and should not be monitored, what's -- what's happening here and why are we getting --
MR. CHEW: Can I ask Joyce a real quick question?
MR. GRIFFON: Yeah.
MR. CHEW: When you talk about the HPs, were they like the RCTs on the floor, Joyce, or these were kind of --
DR. LIPSZTEIN: I -- I can't hear you well.
MR. GRIFFON: Talk a little --
MR. CHEW: Joyce, let me ask the question here, and I'd like to see the log books because, you know, if the people were on a routine sample -- I'm just giving you an example -- and there may

be some -- like a little spill or something like this, and then people would be a -- reasonable to discuss among the people right on the floor to say well, you know, should the person go in for a special sample, and so that -- you may have been misinterpreting that person not being monitored. But I'm not saying that. I'd like to see the log book to see what the references and the citations --

MR. GRIFFON: Well, SC&A will provide that --

MR. CHEW: -- I think we'd like to analyze it.

MR. GRIFFON: -- I think we all agree that that's a deliverable --

MR. FITZGERALD: Right, that's a deliverable and --

MR. CHEW: That's a normal practice.

MR. FITZGERALD: Right.

MR. GRIFFON: Yeah. I think part of the reason it wasn't ready for this meeting was there's privacy -- you know, they've got to --

MR. CHEW: I understand.

DR. LIPSZTEIN: Yeah.

DR. MAKHIJANI: They've got to clean up the --

MR. GRIFFON: -- clean up the document, take -- take references out to names and things like

that, yeah.

DR. ULSH: Well, as long as you communicate that stuff to us so we can look at it. I mean --

MR. GRIFFON: Yeah, yeah, yeah.

DR. ULSH: -- there are no issues between us, but if it's going to go in the public domain, absolutely.

MR. FITZGERALD: Right, right.

DR. MAKHIJANI: The bottom line on this piece of the discussion that John was alluding to and what Joyce and I said earlier is you have to show that the workers were in the same distribution as the monitored workers. (Unintelligible) a group of workers that were unmonitored that were at risk that are completely separately characterized from, whether they worked with radionuclides that -- they were in areas that there was no monitoring or radionuclides that there was no monitoring, you can't draw from a uranium/plutonium sample for monitored workers and say it's good for this piece. But if you characterize the workers by radionuclide area, period and so on, and you know they were in the same

distribution, then you can -- then it's not an SEC issue.

MR. GRIFFON: Right.

DR. ULSH: That'll be in the piece that you send over to us?

DR. LIPSZTEIN: And the other problem is that when you see the data from -- for uranium, for example, you have the same worker. A lot -- you know, a lot of samples from the same workers, and some of the samples have zero results, some of the samples have high results. So when you put all of that in the distribution and you place an unmonitored worker, you know, how -- how do you place him because if you took the monitored worker, he wouldn't be placed anyplace on that distribution because sometimes he have a zero result, sometimes he has a median activity and sometimes he has a high activity, or he may just have zeroes or he may -- you know.

MR. GRIFFON: That's what I -- I was -- one thing I was trying to -- I don't know if I conveyed this very well, but one of my things that I saw in the log book is there is one individual that comes up many, many, many

times, and I'm almost wondering from the experience I've had from some of the sites if this guy wasn't an HP and he wasn't doing some field research, really -- I mean on himself, basically. It looks like that kind of thing. There -- there are like -- there's like six or seven days in a row where they've got data, and a lot of it's in the database, and a lot of them are very low values, zeroes sometimes, but I think they're just trying to decide, you know, should we do -- and they -- it wasn't clear -- I think some said spot, but in -- but they're in there as a 24-hour sample. Some said 24 hours, some said average, and I don't know what average meant, really, in the log book I couldn't tell. But then -- so some were in the database, some were not in the -- in the HIS-20 database, you know, but they're all considered sort of equal in this -- in this -- you know.

DR. WADE: Well, we -- I think we --

MR. GRIFFON: So that was my point is like, you know --

DR. WADE: I think when we come back, this -- this data reliability issue really needs to be

worked, but --

MR. GRIFFON: Yeah.

DR. WADE: -- I think it's appropriate for us to break for lunch.

MR. GRIFFON: Yeah.

DR. WADE: How long do you want to take for lunch?

MR. GRIFFON: Lew is calling for lunch.

DR. WADE: Well, I think we'll be more productive when we --

MR. GRIFFON: Right, right, let's take an hour.

DR. WADE: Okay.

MR. GRIFFON: An hour for lunch.

DR. WADE: So we're going to -- we're going to reinitiate the call at a quarter to 2:00, eastern time. Thank you.

(Whereupon, a recess was taken from 12:45 p.m. to 1:50 p.m.)

DR. WADE: This is the working group conference room. This is Lew Wade. We're slowly assembling. We're almost here.

(Pause)

... materially all here. I'd like to start with one announcement. To my knowledge, I have been told that Wanda is now a Board member.

MS. MUNN: Oh, is that true?

DR. WADE: That's what I was told. I don't know if it's true or not.

MS. MUNN: Well, I'm so glad to hear that.

DR. WADE: And we're -- we're -- we're glad and we welcome you. As a new Board member, you probably will need some advice from the older Board members and --

MS. MUNN: I am sure that I'll have plenty.

DR. WADE: -- I'm sure they will help you -- they will help you. There's some shortcuts one Board member can follow --

MR. GRIFFON: Get some big filing cabinets.

MS. MUNN: Thank you very much.

DR. WADE: So welcome back.

MS. MUNN: Thanks for the information, Lew. I appreciate that.

DR. WADE: Welcome back.

MS. MUNN: Thank you.

DR. WADE: Okay. Mark?

D&D WORKER DOSE RECONSTRUCTION

MR. GRIFFON: All right. I was going to say maybe we should skip item five and -- and do item six, which is the D&D workers question. Item five is data reliability and I -- I

imagine that's going to be a fairly lengthy item, so -- I'm not sure where we stand on the D&D worker question and I'm pulling my matrix open now, but Brant, do you recall if we -- I mean the real question is what kind of data do we have for tho-- that group, and I don't know if you --

DR. ULSH: There were a couple of specific questions that we --

MR. GRIFFON: Yeah.

DR. ULSH: -- were pursuing, Mark. At the -- I think at the last working group meeting Mike Gibson expressed some concerns about -- particularly in the D&D era -- who received bioassay monitoring and who didn't. And we had talked about taking a look at I believe rad worker-2 training records and making sure that -- well, let me give you a little more -- back up just a step.

MS. MUNN: I can hardly hear you, Brant.

DR. ULSH: Yeah, sorry, Wanda, the microphone at the end of the -- this end of the table doesn't appear to be working very well.

MS. MUNN: Okay, thank you.

DR. ULSH: Is this any better?

MS. MUNN: Much better.

DR. ULSH: Okay. During the last working group Mike had some concerns about bioassays during the D&D era, and we heard from Steve Baker and Gene -- Gene Potter, I think, that during that era it was a prerequisite if you were on rad worker-2 training, that you had to have that to go into radiological areas. And so the way this issue evolved was that it was suggested that we should then go back and pull out those rad worker-2 training logs and pull people out and see if they were indeed included in the bioassay program.

Well, we've talked about that some since, and -- Gene, are you on the line, Gene Potter?

(No response)

Ooh, that's very unfortunate.

DR. WADE: Gene Potter? It might be muted?

MR. POTTER: Yes, I am, and I can barely hear Brant, so I take it that he called on me.

DR. WADE: He did.

DR. ULSH: I did, Gene. Sorry, I'm going to hold this up like a telephone. Can you hear me now?

MR. POTTER: I can hear you just -- it's very

faint still.

DR. ULSH: Oh, that's not on. I bet it's the other microphone.

UNIDENTIFIED: Maybe you could just slide the other mike over while Brant's talking.

(Pause)

DR. ULSH: Okay, Gene, how about now?

MR. POTTER: Oh, that's much -- much, much better.

MS. MUNN: Oh, that's -- that's great, yeah.

DR. ULSH: We seem to have a microphone that's defunct, and I've just evicted -- or Arjun just kindly volunteered to get out of his seat and let me sit there so --

MS. MUNN: Thank you, Arjun.

DR. ULSH: -- at any rate, we've had some thoughts on this and Gene and Steve pointed out that to follow the course that we had suggested is kind of reinventing the wheel. We might -- this kind of thing has already been done in terms of some audits that were done, and the purpose of those audits was to evaluate the compliance with the requirements for bioassay among the Rocky Flats worker population during the D&D period. We have located those audits.

They're in the process of being scanned and will be put up shortly. Gene, why don't you just give a few sentences about what is in those reports.

MR. POTTER: Okay. This primarily consist of -- consisted of output from out self-assessment program where we did, as part of DOELAP accreditation we did quarterly assessments on various topics, so there's some -- you know, a bunch of miscellaneous things, some of them related to this question. And as well there are three audits that were done under the 10 CFR 835 triennial audit scheme by Kaiser Hill. These were independent people who did not work in the program who came in and made findings and recommendations based on their -- the requirements of 10 CFR 835.

DR. ULSH: Okay. So this question about, you know, who was bioassayed and who wasn't and what was the state of compliance we think is -- Gene's very familiar with these audits so we think that that will hopefully address the questions that were raised on this issue.

MR. GIBSON: Brant, this is Mike.

DR. ULSH: Yes, Mike.

MR. GIBSON: My question basically more went to the fact of what's called a routine bioassay program. And in the production days at least, from my experience, you were bioassayed at least quarterly. And in the D&D phase it was still called a routine bioassay program, but it was an annual bioassay and the rest of the time they tracked your dose by DAC-hour tracking, and so I was wondering how complete the dose of record is for these people if that's the case.

DR. ULSH: I think, Mike -- I'm going back to the previous working group meeting -- the DAC-hour tracking was on top of the bioassay program. In other words, once you hit a certain number of DAC hours, and I don't know that number off the top of my head, but that would trigger -- that would be a trigger for an additional bioassay on top of the routine bioassay that was being done underneath. So I guess where I'm at is let us post these audit reports and -- I don't know, I'm trying to get my head around what your question really is, Mike, and -- and make sure that these reports that we're going to provide are going to answer that. But it's going to talk about, you know,

what the requirements were and how successful Rocky Flats was in meeting those requirements. Does -- I know that you can't really comment on a report that you haven't seen yet, but assuming that that's an accurate description, is that the kind of thing you're looking for?

MR. GIBSON: I guess I could wait and look at the reports, but basically my question is during the production years was Rocky Flats ever on like a quarterly bioassay program and did it change to an annual.

DR. ULSH: Okay. Gene, do you know the answer to that question?

MR. POTTER: Yes. The program remained -- from the -- from the '90s in the D&D era the program remained basically an annual urine sampling program. I'm kind of glossing over things, but we were never on a quarterly routine bioassay. I should mention that the real way to detect plutonium intakes in particular, at the levels of regulatory interest to DOE, was not through routine bioassay but through special fecal bioassays taken relatively early after an event. So that was the real way we detected new intakes. The routine bioassay program was

overlaid on that as a safety net, it was sometimes termed, to catch any large intakes that would not have been anticipated. And by and large these were not seen in the few cases people's doses from their historical record was -- were changed upwards because of new bioassay information, but generally these were old intakes that we were seeing because of the better sensitivity in urine. But the main -- main way to detect new intakes was through early sampling, which always included fecal sampling, and in the higher cases also included urine sampling, especially urine sampling and lung counting.

MR. GRIFFON: And you -- and of course you're assuming that -- when you say they were mostly old intakes, that's -- that's sort of an assumption 'cause you had no field indicators. Right?

MR. POTTER: Well -- well, yeah, we --

MR. GRIFFON: And the history of the data I guess.

MR. POTTER: Yeah, the history of -- the person's history, and inter-- you know, this would be followed by an investigation which

included interviews with the individual.

MR. GRIFFON: I guess my -- I know, Mike, you've raised this quarterly versus annual before. I think my issue was more toward, you know, was everybody at least on an annual program, and I think part of this stems from some of the statements we heard at one of the meetings in Denver -- I think it was in Denver -- where some of the folks came up and they kept emphasizing the air monitoring program. I'm not -- you know, I don't know if they ever said they weren't on urinalysis programs at all, but this question of did -- did -- you know, certainly a few people could have fallen through the cracks, but was it significant -- was it a large number, was -- were these subcontractors picked up in this program. And on paper, you know, I -- policy-wise, it seems that they would have been covered, but we were asking for validation of that policy by -- you know, sort of show us the records that indicate that that was in fact -- the policy was being practiced. And that's -- I'm not sure if these -- self-assessment audit program's going to -- going to cut it. It might. I mean I haven't

seen it, so I can't -- I can't respond to it too much --

MR. FITZGERALD: The other question, too, if it's a DOELAP accreditation review, it may not answer some of the operational questions, who actually received the monitoring. It would have looked at the quality -- the quality assurance aspects of what was done, whether the -- you know, whether the sensitivity was where it needed to be and all that.

What -- what's puzzling, just to reaffirm what Mark said, is we did get testimony certainly in Denver, and having been involved in the Mound review, we also got site expert input at Mound, that raised some questions about whether routine bioassay monitoring was maintained into the D&D phase or whether reliance was somehow whole or partly switched to lapel sampling and special bioassays. And I think in both cases, at Rocky as well as Mound, we got sort of conflicting input from workers. So it seems to me if we could somehow get, one, a -- since this is fairly -- relatively recent compared to a lot of the work that we're looking at. This is going back to the '90s. If we can get

written policies, what was the written policy or procedure for internal bioassay in the D&D phase at Rocky, I mean I don't think I -- we've looked for it and we didn't find it, but certainly it must exist. That would be helpful. And then the question just becomes if that was the policy, how was it implemented, whether these first, second, third tier subcontractors -- which is a complicated picture -- at some of these clean-up sites were encompassed and in fact included in the program or not, 'cause there's a cost issue there. At a lot of the sites they were pushing hard time-wise and cost-wise, and you know, there's certainly a potential for people being left out for those reasons. So I think that would be the second -- second set.

DR. ULSH: So if I understand what you just said, Joe, one piece is what were the procedures. And I think -- I think we can very quickly provide you with a copy of what the procedures were in terms of who needed to be on bioassay and who didn't. That we can do pretty easily. Right, Gene? We've got those readily at hand.

MR. POTTER: Yes, there was, you know, changes over time, and so the easiest thing is to provide, you know, what the last policy was. To provide a complete history would probably take more effort.

DR. ULSH: But we're talking about the time period from about 1990-ish forward. Right?

MR. FITZGERALD: '90 -- I'd say '91 or 2 forward, and it would be helpful to have two or three different time frames within that ten years, because I think it did evolve. I agree with you, it did evolve from the early days. But specific to workers who were involved in D&D 'cause what we've heard I think -- part of the conversation we've had is that rad worker-2 D&D workers were the ones that were, you know, earmarked for both training as well as for routine bioassay. And you know, the question that we'll -- had before that were, you know, what was the -- the criterion for being able to work in a D&D environment with potential for radiation exposure. We're told you had to have a rad worker-2 to get in. Okay? So that was -- that was the benchmark. So if -- if you could demonstrate that everyone who could get

into a D&D area by virtue of the procedures had to be rad worker-2 trained, and if you're rad worker-2 trained you got routine bioassay -- even if it was once a year -- then I think the issue goes away. I don't -- you know, I think then you have the policy, you have -- you've benchmarked who was involved in that policy of workers, and then you've also established that in fact the records show these people were bioassayed. It wasn't just the first tier, but the second and third tier that might have been involved were bioassayed. There's nobody left out.

MR. GRIFFON: Then the issue goes away.

MR. FITZGERALD: The issue goes away, yeah.

DR. ULSH: Okay, so a couple of things. First, we'll give you the procedures. That's one prong of this. Second is let us put up these -- these audit reports and you guys take a look and see whether that answers your questions or not --

MR. GRIFFON: I mean you've looked at the audit reports. Do they -- do they contain the operational sort of questions we're asking of who was -- who was in the monitoring program?

DR. ULSH: Gene?
MR. POTTER: The --
MR. GRIFFON: Are they more on the laboratory end and detection limits, the sensitivity?
DR. ULSH: That's (unintelligible) --
MR. POTTER: Now this -- now they were audits against the 835 requirements, and -- and -- now, in some cases -- some -- some of them may have been, you know, less specific to answer the exact question that you're asking. But certainly those audits did include a review of appropriate people being bioassayed. As to what, you know, detail they're written up and -- I can't, you know, vouch for at the moment. It's been several years since I've read through them thoroughly.
DR. ULSH: So -- so I guess what I propose is we'll give you those procedures.
MR. FITZGERALD: Yeah, that's fine.
DR. ULSH: We'll put up those reports. If you have remaining questions, let us know and then, you know, we can talk about whether to go further.
MR. FITZGERALD: Yeah, any questions whether this -- whether the three audits would perhaps

some of these questions (unintelligible).

DR. ULSH: I don't know that there's three.

MR. FITZGERALD: Oh, okay, I just heard three.

MR. GRIFFON: Two or three -- three different individuals worked on the audit I think he said.

MR. FITZGERALD: Oh, okay.

MR. GRIFFON: Three independent people worked on -- it might be one audit report.

DR. ULSH: Could be.

MR. POTTER: Yeah, I think there's -- there's a triennial audit, so I think we had one probably in '97, 2000 and 2003 or 4.

MR. FITZGERALD: Well, what -- we'll I guess see what's in there and decide whether it answers these questions and get back as soon as we can.

DR. MAKHIJANI: Just to be clear, I think the question that Joe was raising, and Mark, is there may or may not be a need, but the ques-- the question that needs to be answered, other than the procedures, is were the people who were required to be monitored by the procedure actually monitored -- under the pressures of the accelerated clean-up and all the things

that went on in -- and some verification may be necessary or not.

DR. ULSH: Yeah, I think -- I think these audits are going to speak directly to that question --

DR. MAKHIJANI: Okay, great.

DR. ULSH: -- but if they don't --

MR. FITZGERALD: Yeah.

DR. ULSH: -- take a look, if you want more, just -- let's discuss it.

That was -- now when you say D&D, Mark, I'm -- I'm thinking that that was the major issue was --

MR. GRIFFON: I think that was it, right, the D&D work?

DR. MAKHIJANI: Is that working over there? Otherwise you can just sit here and I can move.

DR. WADE: I think it's a work in progress.

(Pause)

DR. ULSH: Just to let you know where we are, folks, we're experiencing technical difficulties. We're getting another microphone hooked up. It might be just a minute or two.

MR. GRIFFON: Joe, was that it on the D&D issue, that --

MR. FITZGERALD: Yeah, and again --
MR. GRIFFON: -- was the main (unintelligible)...
MR. FITZGERALD: -- it was, you know, a question of whether bioassay was the primary or whether in fact it somehow -- lapel sampling and DAC-hours somehow became the replacement primary I think was the question raised by a couple of people that testified. I think this is the question we're just trying to answer since that was laid out there.
MR. POTTER: This is Gene again. It might be worth making the point again that we didn't treat subcontractors any differently than site employees as far as routine bioassay goes. Now you are -- you are right that they are a diffi- - a more difficult group to track down and keep track of, frequent comings and goings and so forth, and that was done primarily through tying entry into the program through getting a TLD. And most areas were posted, RCTs and the plutonium site, for much of the D&D era. HIS-20 was an access control system as well as a records system, and so you had to have the right qualifications to get into certain areas.

MR. FITZGERALD: And was our understanding then that in fact for D&D controlled areas rad worker-2 was pretty much the required training for anyone to have access?

MR. POTTER: Right, and as for -- if you look at the definition of what rad worker-2 was supposed to encompass, you know, working in contamination areas and above.

MR. GRIFFON: So it had to be in -- at least in designated contamination areas. Right? Yeah. And that gets --

MR. FITZGERALD: Which isn't 100 percent, but it's close.

MR. GRIFFON: That gets down to defining the designated areas, too.

MR. FITZGERALD: Right.

MR. GRIFFON: Right, right.

MR. FITZGERALD: But that's -- that's a tough one.

MR. GRIFFON: We know the problem with that, but anyway -- all right.

DR. WADE: Sound check.

MR. GRIFFON: Sorry.

DR. WADE: Brant, you want to talk a little bit?

DR. ULSH: Yeah, can -- can anybody hear me now?

DR. MAKHIJANI: Is it on?

MS. MUNN: I don't hear you much better than I did before, Brant.

DR. ULSH: Okay.

MS. BRACKETT: (Unintelligible) okay, thanks.

(Pause)

DR. ULSH: Okay, now we're trying musical chairs so I've moved to a better spot, I hope.

MS. MUNN: And you sound remarkably clear.

MR. GRIFFON: Stand by just another minute or two here.

(Pause)

MR. GRIFFON: All right, we're ready to go again, I think. Thanks.

So I think we're wrapped up with the D&D for now. We've got those actions. Right?

MR. FITZGERALD: Yeah.

DATA RELIABILITY:

MR. GRIFFON: Yeah, yeah. And last but not least is the data reliability questions. And I guess -- you know, there's several tiers of this. I was proposing to first discuss the -- and I'm not sure where this falls on the

matrix, but I can crosswalk this later, but the question of looking at the log books -- there was a action item to outline a methodology for checking the logs, various time periods, various process areas, against the HIS-20 database. And Brant, I think you said you had a -- a update on that, at least, on where you're at.

DR. ULSH: Yeah, we had a conference call on Monday with SC&A and NIOSH -- well, mainly me -- and Mark participated as well. Yesterday I had an update with the team to get a better picture on where we are with the log books, and I've asked Bob Meyer to put together kind of a summary of where we are with that, so I'll turn that over to him.

Bob, you might have to come down here, I -- the microphone situation.

(Pause)

MR. MEYER: Have to bring the right file up on the screen there (unintelligible).

MR. GRIFFON: Are you working from something that we have or this is new -- brand new --

MR. MEYER: This is new --

MR. GRIFFON: Oh, okay.

MR. MEYER: Here it is, you're welcome to have it. I --

MR. GRIFFON: No, that's...

DR. ULSH: I just asked for like a summary last week.

MR. MEYER: What Brant asked for was a -- a summary of the log books that we have in our possession, and we extended that a little bit to include some other information related to the log books. We have access to all of the log books that either we have requested in the course of the investigation or that Kathy had requested, as well, because they're all in the same area over there. And I've got a description of the -- the contents of the log books that we have. There's a total -- and I'll either go through the whole thing or I can provide it to you, either way. There's a total of 44 log books that we have in our possession and they -- the dates range from -- I'm scanning through this, it's not in order -- 1953 to 198-- where'd that one go, I'm sorry -- 1985. And I'll give you just a smattering of the contents and you can ask -- ask questions or -- or look at the listing yourself.

They include log books -- 1957 special analyses log book from -- the contents actually go from 1966 to 1969. One that's simply a log book for the period '63 to '68 that's presumably an HP log book but it -- we don't have a summary in here. Another HP log book from 1968 to '71, so that's inclusive from '63 to '71. We have a log book called "Building 771 fire, 1957" in our possession. We have a log book with a personal name; I probably shouldn't -- from 1965. It's an HP log book. We have --

DR. ULSH: (Unintelligible)

MR. MEYER: No, it's (unintelligible).

DR. ULSH: Oh, yeah.

MR. MEYER: (Unintelligible) and I'd rather we -- you're obviously welcome to -- to see that. We have two industrial hygiene and safety historical collections. They're dated 26 May 1969, so it sounds as though the collection was put together then.

We have, from 1953, a medical or health research project case file -- I'll just read the parts that matter -- including urinalysis lab records and -- and there's a note in here that at that time -- there are discussions of

coprecipitation electroplating, which Gene and I were interested to see at that -- was occurring at that date at -- at Rocky Flats. There's a 1954 log book with the same title, essentially medical or health research project case files, so that includes urinalysis lab records. There the note has to do with the type of extraction they were doing at the time. It was an ether-based extraction at that time. 1955, essentially the same notebook, urinalysis results, ether extraction and coprecipitation were noted. Was that a question?

UNIDENTIFIED: No.

MR. MEYER: These are out of date order, I apologize. I should have sorted them. There's a 1969 health physics and internal dosimetry collection. These are Roger Falk's daily dosimetry logs for 1967 through 1969. I'm kind of reading from several columns at once here.

1972 log book, the Kittinger log book that you've heard about a number of times, medical or health physics case files. Brant has spent a lot of time with the Kittinger logs.

We have a 1985 log book, health physics and

internal dosimetry collection log book, staff -- it's a staff log book -- and the inclusive dates there are 1981 through 1985.

We have the Kittinger log book number 111 and a foreman log number 71, and I don't have any details on that. They're both dated -- that's not correct; I don't have the dates on those.

Then we have a series, and I won't go through all of these, of 1957 logs that are all called radiation monitoring protection. There's a series of 24 log books that are called the foreman log books, and they include the dates 1957 through 1975, so 24 log books for that.

Let's see, I've got two sets of dates here, interesting -- no, that's correct, 1957 through 1975, so -- so that's the bulk of the set.

Even though that -- those are called 1957 log books, that's the begin date. They actually are an 18-year period of radiation monitoring protection logs.

Now we -- we cross-checked this just to make sure that we understood that we had everything that Scott Raines, who's the records management fella who's been helping with this at -- at the Mountain View Records Center, and the list of

log books that he has extracted, either for us or for Kathy is the same list. So these are the logs that we have.

I've got another set of descriptions of those log books that Amy Dean had put together for me.

We have a set of log books that was a disk that just came in today, and I actually haven't seen that disk. I was in an airplane yesterday and haven't -- haven't seen that one yet, so as soon as we understand the contents of that disk, we'll -- we'll provide it to you.

Let's see -- oh, and Scott Raines, in looking for -- we've -- we've made approximately 100 requests to date for materials from the Mountain View Records Center based really almost entirely on your requests. I've asked Scott, just for the fun of it -- let's just see if he responded just now -- how many actual documents we've retrieved because we were interested in determining that -- and I don't have an answer yet. I'm guessing it's well in excess of 1,000 individual documents that we've physically retrieved based on requests related to the SEC petition and originally the SC&A

review of -- of the TBDs, but primarily that's SEC petition-related work.

So those are the log books that we have in our possession.

DR. ULSH: So just to summarize, we have about 40 --

MR. MEYER: 44 -- 46 (unintelligible).

DR. ULSH: -- 46 log books that we have in our possession that are -- that are scanned.

MR. MEYER: Yes.

DR. ULSH: And my first -- the top of my priority list next week is to get those up on the O drive so that you guys can see what we've got in hand.

Just to bring everyone up to date on other actions on this log book issue, Kathy has suggested that the Kittinger log -- I just looked at one of the Kittinger logs. There's a set of them that covered different time periods, had a lot -- it was -- it had a lot of information that was data rich, and that did indeed turn out to be the case. I presented my analysis of the first Kittinger log at the last working group meeting.

Now I want to hand a packet around the table

here -- maybe get this going both ways -- just to -- just to kind of give you a perspective. We had a short discussion on log books during the call on Monday, and I mentioned that some of my HP-- some of the HPs at -- at NIOSH had already looked through a couple of these log books, and I've just scanned the first five pages of -- of the three that we've looked at already. There are two decon dailies and one that is called a contamination control report. I just want -- I think it's just worthwhile to show you what these logs look like, what kind of information is and is not in them.

Now based only on these three -- only on these three -- we didn't find much in these three. These three are already posted on the O drive so if you're interested you can go look at the whole -- the whole log. But I think it's worthwhile just to get a perspective as to what we're talking about with these logs.

Now during Monday's conference call Mark and Kathy indicated that they had had some -- some better luck finding data that could be cross-checked against radiation files to -- just to see whether or not they -- to what extent they

agree. And I requested that -- you know, if you've had better luck, if you've gotten luckier than -- than I have so far, please send me those logs -- I mean just tell me which logs those are so that we can make sure that we include those in our analyses.

When we last spoke about this at the last working group meeting, we committed to provide a plan. The detailing of that plan is really kind of contingent on what we find in the logs. I mean it would be one thing for us to say we're going to look at this, that and the other log, and then once we look at it there's nothing in it. So we are looking through them right now, just taking a brief first-pass through to see whether particular types of log books turn out to be -- to have data that we can actually look at. So that piece will be coming as we take a look at these 48 log books that we have in our possession.

In addition, I don't know if maybe you called them by another name, Bob, the urinalysis log books were considered kind of a separate type of log book. That I think everyone -- I think it's pretty safe to say that those are going to

have of course pieces of data that we can check against the rad files, and we have located some of the urinalysis logs from -- in the '50s, I don't remember the exact dates.

MR. MEYER: Right, Gene actually has the exact dates. Gene, are you there?

MR. POTTER: Yes. That'd be '52 to '55, and then '60 through about '68.

DR. ULSH: All these musical chairs, I've lost the document I need.

MR. GRIFFON: And that -- is that it, Gene?

MR. POTTER: Yes, other than to say that --

MR. GRIFFON: Nothing in the '70s.

DR. ULSH: Well, we do have --

MR. GRIFFON: Nothing yet, anyway.

DR. ULSH: -- we do have a piece of information for you on that, Mark, as soon as I can find it in my matrix, which I just relocated.

Okay. We have both uranium and plutonium urinalysis logs for '52 through '55. We have both plutonium and uranium for '63 through '68. We are currently looking for urinalysis logs for '69 through '71. Now at some point --

MR. GRIFFON: You mean you know they exist but you just can't locate them, or --

DR. ULSH: We know that they exist; we have not yet located them.

At some point after 1971, we don't know the exact date, they went to an electronic reporting system, so these log books would have ceased to be prepared. That's after '71, but I don't know exactly when. So for the ones that we have, we're going to start going through them. As we agreed at the last working group meeting, I'm going to -- it will probably be me. I'll go through and pick out a handful of data points from representative logs -- urinalysis logs -- and we'll bounce that off of HIS-20 and see to what extent they do or do not agree.

MR. GRIFFON: So there's -- post-'71 they were entering directly from the laboratory --

DR. ULSH: At some --

MR. GRIFFON: -- to some sort of database, which then might have been merged with HIS-20 or whatever.

DR. ULSH: Exactly. At some point after 1971, I don't know the exact date. We know that there -- there should be log books up through at least 1971, and sometime after that there

won't be any, but we don't know exactly when that happened.

MR. GRIFFON: So there's no real paper record to check after -- after -- some point after '71. I mean after -- once they went to that electronic system, there's no real paper record to --

DR. ULSH: I'm going to --

MR. GRIFFON: -- check against.

DR. ULSH: I'm -- I'm going to say that there were -- those results were recorded electronically from the get-go. Now, Gene, is that correct?

MR. POTTER: Those -- those results that -- after that system went into effect would have been, you know, exchanged between databases and the printouts put in the folks' files, so the most direct evidence of a bioassay is in the individual files. And I was involved when they shut down the last LIMS system from Building 123 when we went to all off-site analyses, and this occurred early in '97. I think the LIMS system was checked and rechecked to make sure that all the data was gleaned from it, and then it was archived in some fashion, which you

know, we would have to further investigate as -- you know, probably the software that ran is no longer current. The platform it ran on is probably no longer available. And so the most direct evidence is -- is what was printed out and put into individual files.

MR. GRIFFON: Gene, can you clarify the LIMS system, what --

MR. POTTER: The Laboratory Information System or some such acronym for it. There were two -- there were two -- at least two versions of that. The last was called L-I-M-S, LIMS. The one before, I never remember what it was, certainly well before my time.

MR. GRIFFON: All right.

DR. ULSH: That's where we're at.

MR. GRIFFON: Okay.

MR. MEYER: And I did -- the list actually did just come in. We have ten additional log books in our possession on the disk that came in this morning or last night. They include 1964 to 1968 monitoring surveys; 1961 radiation history files, health physics log books, including urinalysis results; 1962 radiation history files including urinalysis results; 1962 -- the

first one was the first part of '62, the next one is late '62 to early '63, same thing, radiation history files including urinalysis results; the same type of log book for later in 1963; two -- one decontamination facility log book for 1996; one clean-up log book for 1969 -- 5/21/1969, which will be interesting, that's the second one of those that we've -- that we've found and it just -- just came in; and two more down here at the bottom that were radiation monitoring protection log books -- this is a full set, 1982 to 1990, two -- two sets. Those must be large files. I don't actually have the files in here yet, but I just requested the list. So what's happening is --

MR. GRIFFON: Yeah.

MR. MEYER: -- I meant to say earlier that Scott has been going back through their records using different types of keyword searches because that's the key to the whole thing with that large a record set, and this last week -- understanding what it is we've been looking for -- he's gone back and dug out some additional -- you know, they're not random sets, but things related to all of the requests that we've made

and that's what this disk contains.

DR. ULSH: The other piece to this, and I don't know if this is the right time to get into this, Mark, or not, but we've also posted a log from the 1969 fire. What kind of log book is that, do you remember?

MR. MEYER: It's -- it looks to be a foreman log. It -- it's -- it's difficult to tell actually who wrote it. It's one of those that's kind of scratchy --

MR. GRIFFON: Is -- is -- is it -- is it a log book from the fire or around the time of the fire?

MR. MEYER: It -- it actually covers --

MR. GRIFFON: Nothing that has dates that we're miss-- I --

MR. MEYER: It covers the period of the fire, and you can -- and I actually have it on here if you -- and it's available to be looked at. It covers the period of the fire up to the period. It's routine events, the night of the fire. It's -- it's a sort of --

MR. ELLIOTT: Catastrophe.

MR. MEYER: -- catastrophe event, and there is a period in the log book when there's just an

occasional note that they were in there again all night.

MR. GRIFFON: Oh, okay.

MR. MEYER: That sort of a note.

MR. GRIFFON: That's a different one than I saw then.

MR. MEYER: Okay, it's -- it's a -- real time during the -- during the event itself. It's an interesting log to read, and you can tell during that first couple of days he didn't have much time to write.

MR. GRIFFON: Right.

MR. MEYER: Mel has a lot more information on that period of the fire itself.

MR. GRIFFON: Yeah, and we can -- I won't -- I'll let you share that, too, Mel, but I -- I want to stay on this for a second, though. The -- Brant, I think to some extent your question might have been answered by those last entries that came in. By the titles of those it sounds like they have urinalysis records --

MR. MEYER: It does by the titles, yeah.

MR. GRIFFON: -- in several of those, so at least to some extent we -- maybe they're not data rich, but --

DR. ULSH: It could be that --
MR. GRIFFON: -- by the title it sounds like they might have something.
MR. ELLIOTT: But -- but your interest here is to cross-check the data from the log book for urinalysis with that that's in a database.
MR. GRIFFON: Right, right, right. Well --
MR. ELLIOTT: That's your interest here.
MR. GRIFFON: I guess -- you know, just to go back to, you know, why -- I mean the whole thing is -- the main thrust is is the data that's being used for the dose reconstruction reliable, and not only are -- is the workgroup and SC&A interested in that, but we've had the petitioners -- the sense of them is the -- you know, and not one individual allegation, but you know, we've heard that from several people. We even heard it from Jennifer Thompson saying that, you know, it's not my case, I'm just using mine as an example of what might have happened to others, so -- yeah, so we're trying to look at that broader issue and --
MR. FITZGERALD: And we -- and we -- when we interviewed the former RCTs, you know, and said, you know, where's the corroboration, we

kept hearing the allegation of, you know, really no documentation. And the response was well, you know, look in the safety concerns. There are safety -- this is coming from the union, of course, the safety concerns file -- and log books. The RCTs were pointing to the log books, so that -- that was the genesis of saying okay, if there's any corroboration it's going to be found in those two locations -- but nothing specific. That's probably part of the challenge is deciding how you look at it.

MR. GRIFFON: So that -- that's where this is coming from. That -- what you just said about sometime after '71 and going down electronics, this might -- that's the first I had heard of that, too, so that --

DR. ULSH: You mean (unintelligible) --

MR. GRIFFON: -- explains a lot of what we're seeing in the files 'cause you don't see the -- the raw data anymore after a certain time period there.

DR. ULSH: And it could be that these last ten things that we've got, Mark, maybe they're not called log books, maybe they're -- I don't know, maybe they're something else, but --

MR. MEYER: It looks as though something like that is happening that they're testifying (unintelligible) --

DR. ULSH: We'll have a better feel for it, though, after we take a look, but --

MR. GRIFFON: So I mean I'm -- I'm looking at this sort of like we did at Y-12. We -- we had multiple prongs and -- and it wasn't any -- any -- necessarily any neat, formal method, but by looking at a number of different sources, including monthly progress reports, quarterly progress reports, some urine cards in one case, you know, got enough corroboration with the database that we said, you know, it looks good. Now in this case I think we're -- it's a little bit different because I think we're less concerned about the database for use as a coworker model where at Y-12 that was the big thrust, you know. I think here we're more conc--

MR. MEYER: On an individual basis.

MR. GRIFFON: -- right, more concerned that the individual record is actually reliable.

DR. ULSH: And so what I see in the immediate future on this -- this particular item is that

next week I'm going to work to get as many of these log books that we have in our possession up on the O drive so that you and SC&A -- the workgroup and SC&A can look at them, and then we're going to do an initial -- an initial run-through on these log books and identify which ones contain data that we can actually compare and which ones don't.

To date -- and I want to make it clear, I've only looked at a very few log books. The Kittinger log books do have a lot of stuff in them. The two decon dailies and the contamination con-- one contamination control log book that I looked at didn't have much in them. But as I mentioned, you know, you found some stuff, Mark, and Kathy said she found some stuff, so if you guys could let me know which ones those are, we'll make sure to look at that, too.

MR. FITZGERALD: Yeah, it seems like the process is to -- to feed to each other. I mean if there are some entries that illustrate the possibility of useful information, we'll pass that on to you --

DR. ULSH: Absolutely.

MR. FITZGERALD: -- and you're going to pass on where, you know, hey, these log books are proving to be not too fruitful, which is the process I think we're looking at, trying to figure out if there's anything here that could corroborate the -- the people that are alleging falsification and other issues. If not, so be it.

MR. GRIFFON: Right. The -- the -- I was just going to say from our -- from my standpoint, I've looked at -- well, let me step back. The 46 you mentioned in your presentation, does that include the ones that were posted already? 'Cause we have about 16 or so --

DR. ULSH: Yeah, there's a bunch of foreman's logs up there now.

MR. GRIFFON: I can't remember the --

DR. ULSH: Yeah, they're mostly foreman's logs, there may be one Kittinger log on there.

MR. MEYER: And actually as of this morning, now it's 56.

MR. GRIFFON: Okay, so now it's 56, right.

DR. ULSH: But those do include the ones that are up --

MR. MEYER: Right.

MR. GRIFFON: Those do include --
MR. MEYER: Yes, it's everything we have.
MR. FITZGERALD: And we've (unintelligible) the foreman's logs are not very useful.
DR. ULSH: At think we agreed to that at the last --
MR. GRIFFON: Then let me just -- just say what I've sort of done spot check-wise was -- I started looking at some of these logs. I found some entries, and I did have an e-mail exchange with -- with you, Brant, on the -- I was finding -- a bunch of the logs had indications that people were sent for lung counts, and sometimes they gave the values in there, sometimes they just said, you know, had a potential incident, sent him for a lung count -- had the name, had the date. So I said I don't even care if -- if I have a count, I can at least corroborate that the individual --
MR. ELLIOTT: (Unintelligible)
MR. GRIFFON: -- right, right, that it occurred, right. And -- and I checked a number of these and I wasn't finding any matches, so I e-mailed Brant and said, you know, wha-- this seems like something's wrong here; is HIS-20

complete with regard to the data. And I think --

DR. ULSH: Well, the answer's no.

MR. GRIFFON: Well, if you can -- if you can tell me exactly -- you know, why -- maybe it's in the TBD, but if you can just give me a once-over what does it have in it, if it's not all of the in vivo for a certain time period.

DR. ULSH: Well, there are a number of --

MR. GRIFFON: 'Cause there's 147,000 points or something like that of lung count data.

DR. ULSH: I'm going to have to rely to some extent on -- on Roger and Gene to talk about the problems with the in vivo data in HIS-20. What I can tell you is that we don't use the in vivo data in HIS-20 for any -- any purpose because we know that there are problems with it. That doesn't apply to the urinalysis, it doesn't apply to the -- the external dosimetry results. And there are a number of issues that are way beyond my expertise.

Gene, maybe you can --

MR. GRIFFON: Well, maybe explain why it doesn't apply to the other two, too, if they can't -- like how do you know one's a problem

and the others aren't or...

DR. ULSH: Okay. Well, I think the rea-- to answer that question, Mark, the issues that we're talking about are specific to in vivo, that -- they're just not relevant for --

MR. GRIFFON: Okay.

DR. ULSH: -- for bioassay. But Gene, can you maybe start off with some of the problems that we know exist with the lung count data in HIS-20? And Roger, chip in.

MR. POTTER: Yeah, Roger probably does a better job on the earlier things, but to kind of summarize, there -- there was -- there's -- HIS-20 recorded all in vivo results in units of microcuries, for one thing. And so the previous databases used nanocuries, so a factor of a thousand different. Even in the -- you know, '95 on when we had Canberra software to run our lung counter and -- and Canberra -- HIS-20, the two systems were supposed to talk to each other and in fact they -- they did, but only in units of microcuries, so some of the results were so small that they wouldn't have shown up in -- in the database. And so I mean that's just one of a number of issues, so

basically all you can use, even for the modern, wonderful stuff, is either a positive count, which will be -- you know, that was well above detection. You can see those in there where the peak was identified, or it was above decision level. But other than that, for routine counts that were below, you're not going to see much more in HIS other than the fact that a lung count was taken on that date.

MR. GRIFFON: But you should see that a count was taken.

MR. POTTER: Yes, you should see that.

MR. GRIFFON: See, I don't even see that. That's -- that's my issue.

MR. POTTER: Yeah. Well, the earlier days relied --

MR. GRIFFON: This is the early days, yeah.

MR. POTTER: In the earlier databases -- from the very start of the -- of the lung counting program, it's been my observation that a hard copy report of the lung count was always placed in the individual records. And to get it into some sort of database initially required a hand entry, so therein lies probably some of the problems and, you know, depending on how many

people they had to do such things over the years. And in -- I know that when -- the end of the RHRS area -- era, which is the database that preceded HIS-20, we were still -- or my technicians were still making hand entries into RHRS that a lung count had been performed, up until the time we could do the electronic transfers. And I've already discussed that even those had problems. But just to maybe make one more point about HIS and -- it was originally procured and kind of rushed into production for Y2K issues, as well as access control. And as evidence of that, I offer the fact that it was originally given to rad engineering to implement and set up access control points and such. And then it became the bioassay database as well. So -- and of course it was implemented in the time of shrinking resources, the site was ready -- you know, designated for closing and so forth. So we inherited many of the problems of the databases where, you know, every time you change one of these things it's almost like pounding a square peg into a round hole. You have different field names. They mean different things. And so none of -- you

know, not all those problems were solved.

MR. GRIFFON: What -- I -- I -- I'm -- in the early days you said hard copy reports were put in the file. I -- I see that readily in the claims files I'm looking at.

MR. POTTER: Yes, I think that continued throughout the whole history of in vivo counting.

MR. GRIFFON: But we just -- I -- I just also heard a history of the urinalysis program where up through '69 the same thing was true with the urine records, you had a hard copy record put -- being put in the files. Why would that be any different than the -- I mean what -- was the intention to update HIS-20 based on the hard copy records of urine files and your in vivo files or was there more emphasis -- I -- I don't understand why...

MR. POTTER: Why urinalysis and lung counting would be any different?

MR. GRIFFON: Well, why -- why -- why you're -- why you're -- why -- why we're -- I mean I'm -- I'm coming away with the understanding that HIS-20 should be reliable for the urinalysis data all the way back to when -- '52 or

whatever, but now you're -- you're -- you're making a case for the fact that it's probably not as reliable for the early years for the in vivo because there would have been hand entry, but the same thing would have been true for the urine data, wouldn't it? I -- I'm getting a disconnect on that.

MR. POTTER: Uh-huh. Yeah, you have -- basically you have different people doing it. I think there was a whole records group and -- and I think we'd better maybe tap into Roger's expertise, but at one time there was, within the rad health organization, quite a large records group. And the bioassay results were hand -- the urine results were hand-entered by those folks. In fact, they went back and caught up all the data that was on the -- on the bioassay cards. I'm not saying that this was done 100 percent to perfection, but --

MR. GRIFFON: So you're saying --

MR. POTTER: -- I'm not -- I've never seen, you know, a big discrepancy there. For some reason or other, lung counting -- which was probably done by people -- you know, started in '65, relied on a -- the people in internal dosimetry

or lung -- the lung count area to provide that information in some sort of electronic form. We talked about, you know, there being a LIMS system, you know, sometime after '71 where the data then became electronically available for transfer whereas, you know, the lung counting did not reach a similar state of technology until '95.

DR. ULSH: And is it fair to say, Gene and -- and Roger, that priority would have been on the urinalysis data because that's -- that's what you use for regulatory compliance, so that's the primary means of detecting an intake. Is that fair to say?

MR. POTTER: I don't think we ever looked at it in those terms, per se. I think it was just two different groups, two different systems of doing things.

MR. GRIFFON: So -- but -- but the bottom line is your -- your experience is that the one is -- is much less -- has more flaws with it than the -- the in vivo has more flaws than the urinalysis.

DR. ULSH: And the analyses that we've done so far, Mark, tend to bear that -- bear that out.

You've seen yourself the problems with the in vivo. But Craig also presented -- you know, we talked about this earlier -- that analysis where he bounced the handwritten cards off of -- off of HIS and we found very good agreement -- handwritten bioassay cards.

MR. GRIFFON: Right, right. Okay, that was helpful -- the explanation.

DR. ULSH: Okay. So before we get off the log books -- are we still on log books?

MR. GRIFFON: Yeah, we're still on log books.

DR. ULSH: Joe, there was -- there was one thing that puzzled me. I want to make sure that I have -- I'm interpreting this correctly. This is the write-up that you sent out yesterday, and there was something that changed between yesterday's version and the one last week.

MR. FITZGERALD: Okay.

DR. ULSH: It's -- let me tell you where it is in the document. I've got it under section two, external dosimetry procedures, it's on the next page, the very bottom of the page.

MR. FITZGERALD: Uh-huh.

DR. ULSH: It's part of the paragraph that says

(reading) The field log books; e.g., contamination control and RCT log books, also have minimal discussions around specific external exposure investigations, indicating that this is not an appropriate reference for this type of information.

Can you just explain to me what -- what that means?

MS. ROBERTSON-DEMERS: Joe, you want me to take it?

MR. ELLIOTT: I'm sorry, where are you at?

MR. GRIFFON: Yeah (unintelligible) --

DR. ULSH: Oh, I'm sorry, this is -- this is --

MR. FITZGERALD: Page three on the bottom.

DR. ULSH: This is the document -- it's the write-up that Joe circulated yesterday -- yes, that the correct document.

MR. FITZGERALD: Yeah, why don't you take that, Kathy.

MS. ROBERTSON-DEMERS: Okay. Basically what I'm saying is after going through 30 log books -- meaning field log books, not dosimetry log books --

DR. ULSH: Right.

MS. ROBERTSON-DEMERS: -- that I found no

information -- or very minimal, actually -- on investigations in those log books about lost dosimetry, et cetera.

DR. ULSH: Okay. If you've looked through those kinds of log books, Kathy, the contamination control and the RCT log books, have you found information like -- well, like I was looking at in the Kittinger log, you know, things that we can bounce off of data in the rad files. Have you found that kind of thing in those log books?

MS. ROBERTSON-DEMERS: Yes.

DR. ULSH: Yes, you have.

MS. ROBERTSON-DEMERS: And I would highly recommend that you -- let me get the dates right here -- that you look at the log book for '57 --

DR. ULSH: Is that an RC-- is that an --

MS. ROBERTSON-DEMERS: -- through '60.

DR. ULSH: '57 through '60, is that a contamination control or an RCT or -- or what is that, Kathy?

MS. ROBERTSON-DEMERS: It's -- it's one of the original log books. I don't think it specifies whether it's foreman or RCT.

DR. ULSH: Okay.
MR. MEYER: Could you send us the cover page and a few specific pages from that one, just so it's easier for us to track back to it?
MR. GRIFFON: I can probably give you file references, too. I think that's one of the ones -- the same ones I looked at, Kathy.
MS. ROBERTSON-DEMERS: Yeah, it's the one that I think you're calling the uranium...
MR. GRIFFON: Right, right.
DR. ULSH: Okay. Well, that might be what I asked -- that might be the same thing -- might be the same thing we talked about Monday where you guys said that you had seen some --
MR. FITZGERALD: Yeah, I think --
MR. GRIFFON: Yeah.
MR. FITZGERALD: -- that's the same.
DR. ULSH: Okay. It would be very helpful for us if you could -- I mean if you've already looked through some of these log books and you know that some of them are useful --
MR. FITZGERALD: Right, I think we can agree to do that.
MR. GRIFFON: Yeah, we can narrow it down, right.

MS. ROBERTSON-DEMERS: Now the reason I'm picking on that log book is not only because of the urinalysis data, but because of several entries that state that badges were destroyed.

DR. ULSH: Okay.

MS. ROBERTSON-DEMERS: Which cannot be really compared back, or at least in the case of the population situation.

DR. ULSH: Okay.

MS. ROBERTSON-DEMERS: But that's also some of the stuff that we're coming across.

MR. GRIFFON: Yeah, and we -- at least, if my memory serves me on this, I -- the first reference I saw to that was that the badge appeared to be contaminated and therefore it was destroyed and they -- I think they even gave references to whose badge was destroyed. And my question was not so much the practice of destroying the badge, but -- but crosswalk it -- what did they assign this guy, you know --

MS. ROBERTSON-DEMERS: Whether they did (unintelligible).

MR. GRIFFON: -- how did they assign dose, or what did they do -- you know.

DR. ULSH: Well, if you've got a guy and if

you've --

MR. GRIFFON: And it happened -- it's more than one. It was several -- I'd say dozens, you know.

DR. ULSH: Well, if you've got particular instances where the individual's identified and we know which badge exchange cycle --

MR. GRIFFON: We can find --

DR. ULSH: -- we can find out at least what dose appears there probably.

MR. GRIFFON: Right.

MS. ROBERTSON-DEMERS: Well, you have a log book date --

MR. GRIFFON: That's right.

MS. ROBERTSON-DEMERS: -- is what you have.

DR. ULSH: You have a...

MR. GRIFFON: You have a log book date so you should be able to find the exch-- if it happens right on a exchange cycle, you might be unclear which quarter you're in or whatever, but you know, you have the date -- the log entry date.

DR. ULSH: Yeah, okay.

MR. GRIFFON: You don't necessarily know -- right.

DR. ULSH: Okay, yeah, it'd be -- okay, we've

already talked about that. Thanks.

MS. MUNN: And Mark, let me understand. Do you want to crosswalk that to see that some sort of indication that appears in the worker's personal file? Is that the crosswalking you're doing?

MR. GRIFFON: Well, see, this -- this is what I'm trying to grapple with is I was -- I was trying to find a way to test the reliability of the data without having to go back to the individual files like Brant did with the Kittinger log book all the time 'cause that's -- that's extensive work to go -- to pull the individual files, especially the non-claimant files, so I was trying to say let's check HIS-20, you know. Then -- then I run into this problem with the lung count data. I know you don't use the lung count data, but it's another way of saying --

DR. ULSH: Yeah.

MR. GRIFFON: -- is my record complete. That's what the -- that's what the workers care about, you know, so that was, you know, neither here nor there whether you use that data. But -- and -- and you know, I -- I am still kind of

surp-- you know, questioning the lung count data. I -- I randomly checked maybe 15 of them and didn't find any entries in there, so you know --

DR. ULSH: It may be that the --

MR. GRIFFON: -- all in the early years, I got to say, you know, but --

DR. ULSH: There are some peculiarities about the dates that appear --

MR. GRIFFON: Yeah, that's what I --

DR. ULSH: -- so that might (unintelligible) something, I don't know what.

MR. GRIFFON: But you know, that -- that's -- that's what I -- I'd like to do, Wanda, and then -- then you -- I mean really the end prod-- the end game here is, you know, do we -- can we demonstrate, to the extent possible over all time periods, that the data in -- in the individual files is reliable, and we've got -- I've got a much better understanding now of what's in the files because you do have raw records for urine, and it looks like up through '69 or somewhere thereabouts you have these urine cards and --

MS. MUNN: That's -- that's why I was

questioning. I wasn't really certain what crosswalk you wanted, whether you wanted it HIS-20 or whether you wanted it to the original records.

MR. GRIFFON: Right -- all right, I -- I think I would like to say let's do -- I -- I'd like to cross-- I mean that's why it's being put -- I'm answering this question -- why am I answering this question, that's a good -- that's the number one question. I mean that's what I asked Brant to lay out a methodology really, because I think -- you know, it's not the Advisory Board's role to kind of demonstrate that. We're asking the que-- you know, show us that the data you've got in these files is reliable and -- and give us some method by which you're going to demonstrate this and we'll weigh it and -- and, you know, considering all factors, you know, make -- make our recommendation. I think that's where I stand. I've got some thoughts on it, certainly, but I would rather -- I don't have access to all the logs, certainly I don't have access to all the documents and the materials that -- that NIOSH does, so that's sort of

where we -- you know, that's where I stand. And I would say my -- this is my personal opinion is I would first look to HIS-20, but then do even a smaller subset against the hard copy files and that would be -- that would make a strong argument, I think, if you did something along those lines, you know.

MS. ROBERTSON-DEMERS: This is Kathy DeMers. I actually did apparently crosswalk three people back to the external dosimetry database, and one individual had a dose -- a positive dose for the quarter in question, and the other two had zeroes. So it might be a good idea to track the zeroes back to the hard copy records.

DR. ULSH: Can you send me the specific information, Kathy? The --

MS. ROBERTSON-DEMERS: It's all in that log book, and the two individuals are actually on page 64 and (unintelligible).

EXTERNAL DATA

MR. GRIFFON: And now external dose is a little different because external dose you have -- from what I've seen, you have worksheets. You don't really have raw data of any sort. You don't have punch cards or anything like that.

You have worksheets which usually give annual or quarterly summary -- usually they're handwritten, from what I've seen, but -- but they're summary --

DR. ULSH: '57 to '60, I'm trying to --

MR. GRIFFON: I didn't see any -- you see any card data or anything like that?

UNIDENTIFIED: No.

DR. ULSH: I don't think there is --

MR. GRIFFON: Yeah.

MS. ROBERTSON-DEMERS: I'll have to send you the actual dates --

DR. ULSH: Yeah, that would --

MS. ROBERTSON-DEMERS: -- then you'll be able to find it.

DR. ULSH: That would be very helpful.

MR. GRIFFON: And now -- now -- again, just -- just to bring all my -- I mean just another part of this data reliability question, in -- in the -- Y-12, the other very powerful piece I think that we found was some of those quarterly reports, not only because they had individual data points in them with certain individuals identified, but the most convincing thing to me, quite frankly, was there were several -- I

think it was quarters in a row where they had summary urinalysis data showing the percentiles, the 50th percentile by month and the 90th percentile by month. And you could pull these number off the graph and say okay, let me pull the database over here and sort -- look at the 90th percentile in the database, compare it with the graph, and they were matching very, very closely. So that was like we don't have to worry about matching, you know --

UNIDENTIFIED: Individual (unintelligible).

MR. GRIFFON: -- Joe A. Smith to Joe A. Smith and one data point at a time, and this was great -- you know, that gave me a lot of confidence in that time period that -- that it was looking good. Now --

DR. ULSH: It kind of looked like --

MR. GRIFFON: -- Y-- Y-12 was a little different, but I didn't know -- you mentioned the other day these dosimetry summary reports, at least for one issue you were talking about --

DR. ULSH: Are you talking about the progress reports?

MR. GRIFFON: Maybe it's the progress reports (unintelligible) --

DR. ULSH: Dosimetry section progress reports.

MR. GRIFFON: Yeah. I don't know if they have that kind of information in them, though, but --

DR. ULSH: Those particular things -- those particular documents don't have --

MR. GRIFFON: Okay.

DR. ULSH: -- percentile values. They do have --

MR. GRIFFON: Or -- or anything useful for this kind of analysis.

DR. ULSH: They have a number of people wearing badges, I think, in them.

MR. GRIFFON: Yeah.

MR. MEYER: (Unintelligible)

DR. ULSH: I'm not sure on that, I'd have to go look at them.

MR. GRIFFON: So there -- there might be something to glean from those, and you say they're on the O drive. I'm not sure I know where.

DR. ULSH: No, I didn't. Kathy said they were on the O drive.

MR. GRIFFON: Oh, Kathy said they were on the O drive. Okay.

DR. ULSH: I have them on a disk. I don't know whether I've ever put them on the O drive. That hasn't been requested but I can -- I'll put them on.

MR. GRIFFON: That would -- that might be useful. If there's nothing there, there's nothing there we can use, but it might be useful even --

DR. ULSH: Dosimetry section progress reports.

MR. GRIFFON: It's a lot easier than going to the individual files all the -- if -- if we can corroborate that way, that's what I'm trying to achieve here.

DR. ULSH: Okay, that's an idea. That's about where we are with the log books. I don't -- is there anything else we want to talk about on that?

MR. GRIFFON: Let's see, I -- Joe, do you have any -- anything else on the log book section? I --

DR. MAKHIJANI: Did you bring up the -- the entries you didn't find for the bioassay (unintelligible) --

MR. GRIFFON: Yeah, well, I will provide these, Brant, but I -- I've done -- and that was from -- the main ones that I was able to crosswalk was the uranium log book that Kathy referenced and it's -- it covers that '59/'60 period, I think. I think we're talking about the same log book, Kathy, I'm not sure.

DR. ULSH: Kathy said '57 to '60, is that --

MS. ROBERTSON-DEMERS: I'm talking '57 to '60.

MR. GRIFFON: '57 to '60? Well, maybe I looked mainly at '59 measurements, but it might cover back to '57, too. But '59 and '60 I looked in and I -- I focused on the -- the -- and I think these log entries focus on the higher entries 'cause they're -- you know, that's -- that's sort of what they did. We had an incident, you know, someone still got a sample, they mention later that his analysis came out at 330 percent of the MPL or what-- what-- however it's recorded. Sometimes it's in dpm, sometimes it's in percentages of the MPL. And looking at these high values for that '59 to '60 time period I -- I know it was -- it was more than a third of them were not in the database. I know it might have been as --

DR. MAKHIJANI: I -- I count-- I counted the ones -- when you showed me your spreadsheet this morning --

MR. GRIFFON: Yeah.

DR. MAKHIJANI: -- you'd looked at 76 cases, and you didn't find anything in 33 of them.

MR. GRIFFON: Right, so 33 out of 76 --

DR. MAKHIJANI: About 40 percent.

MR. GRIFFON: -- were not in HIS-20. That doesn't mean it's not in the individual record, so there might be a sub-tier level that for some of these -- because a number of these people -- you see the name again and again. It's the same guys that were getting high exposures, same men and women -- probably men, but -- so you know, that's just a snapshot of one very tiny period, but it -- it raises some questions. And these were all on the high end of the distribution, you know, when you -- you know, these were the higher readings that were not there, so -- and again, I'll share this -- these log books to save time. We don't want to duplicate efforts, for sure.

DR. MAKHIJANI: And Joyce also found --

MR. GRIFFON: Yeah.

DR. MAKHIJANI: -- high value missing, as she said earlier.

DR. ULSH: She was going to send those to us, too. Right?

MR. GRIFFON: Right. She's got some other information that we're going to -- that you're going to --

DR. MAKHIJANI: Yes.

MR. GRIFFON: -- share in your report --

DR. MAKHIJANI: Right, I just --

MR. GRIFFON: -- about some of the writ--

DR. MAKHIJANI: -- I just have to arrange to get the privacy stuff -- it's in a funny form so I have to get all the stuff typed up and the privacy information taken out.

DR. ULSH: I'm not sure I understand that. I mean if you're giving it to us --

MR. ELLIOTT: Why do you have to take the privacy information out?

DR. MAKHIJANI: Presumably this will be a memorandum that will become part of the report --

MR. GRIFFON: If it -- if it gets shared in the meeting, that would -- I guess that's what they're concerned --

DR. MAKHIJANI: Also this is part of a report that Joyce hadn't quite finished, so I thought --

DR. ULSH: Well, I understand that part.

DR. MAKHIJANI: -- while we were -- as we were doing that --

MR. GRIFFON: Yeah.

DR. MAKHIJANI: -- but we can certainly send you the --

MR. GRIFFON: I would say send the version first and then try to --

DR. MAKHIJANI: We can do --

DR. ULSH: We're going to need that.

MR. GRIFFON: -- try to clean it up before the Nevada meeting, but send it -- yeah.

MR. FITZGERALD: I think all the input we're talking about directly to you is not going to be influenced by privacy issues (unintelligible) --

DR. MAKHIJANI: Sure, of course.

MR. FITZGERALD: -- names, everything --

DR. ULSH: That's my point, yeah.

DR. MAKHIJANI: I'll just correspond with Joyce and -- and get that sent to you.

DR. ULSH: Okay.

MR. FITZGERALD: To answer your question, I think that's pretty much -- just items two and three are log book items on the safety concerns.

MR. GRIFFON: The only other -- the only other question I have on the -- not so much really the log books, but back to this crosswalk question and the -- just understanding HIS-20. I mean I -- we -- we threw that question out. I don't know -- I don't expect an answer on the spot unless you know right off, but that question of HIS-20 clearly was missing a lot of high values. When we looked in the CEDR version, the piece that was used for the coworker model, some of those high values were in the CEDR. I'm not sure if it had all of them. I didn't do that kind of crosswalk. But you know, it raised in my mind -- I -- I always sort of thought that CEDR was derived from HIS-20, and even if -- if you look at Craig Little's piece, I pulled it up before the break, and -- and -- you know, he starts off his defense -- or his comparison of the model saying, you know, assuming that -- that -- that HIS-20 is a valid model -- or a valid database,

you know, and if it's missing all these high data points, I wonder if the rest of the analysis --

DR. ULSH: Well, I'm going to have to --

MR. GRIFFON: -- sort of is questionable. But anyway --

DR. ULSH: Yeah, I can't comment on that because I don't know what the high values are. If you send those over, we'll -- we'll look into it.

MR. GRIFFON: Oh, we -- yeah. I mean does anybody know the derivation of CEDR, where -- where --

MR. ELLIOTT: Are we talking the Comprehensive Epidemiologic --

MR. GRIFFON: Yes.

MR. ELLIOTT: -- Data --

MR. GRIFFON: Yes.

MR. ELLIOTT: -- Resource?

MR. GRIFFON: Right.

MR. ELLIOTT: Okay.

MR. GRIFFON: And that database --

MR. ELLIOTT: And isn't that database generated --

MR. POTTER: This is -- this is Gene.

MR. ELLIOTT: -- by all of the study results that have been used in the epidemiologic studies? No?

MR. GRIFFON: No, I'll -- I'll catch you up on the -- the history. I mean -- mean we -- we first saw that the coworker model was -- was derived from CEDR and immediately raised, in my mind, the same questions we had been down with Y-12. Well, what's the -- what's the pedigree, where -- where -- you know, is this the full database, and they said really the primary source was HIS-20, and then they said but rather than do -- redo the coworker model, Craig Little offered an analysis that said basically if we used HIS-20 or --

DR. ULSH: No, that was (unintelligible).

MR. GRIFFON: Oh, I'm sorry. All right, I got the wrong person. I apologize. There -- an analysis was offered that it wouldn't matter if you used HIS-20 or -- or the CEDR database to do the coworker model, little fluctuations but basically the intakes derived would be the same. That was the -- the piece that was offered to the workgroup 'cause -- 'cause we raised that question, you know, what -- you

know -- so then I said okay, HIS-20's the primary source. So then if you go back and say well --

MR. ELLIOTT: No, it's not.

MR. GRIFFON: -- how does CEDR have more data, and it was suggested in the write-up that most of the additional data in CEDR were zero values, and I forget the reasoning behind that, but we clearly found a lot of the high values were in CEDR but not in HIS-20.

DR. ULSH: Okay --

MR. GRIFFON: So --

DR. ULSH: -- it is Comprehensive Epidemiologic Data Resource, Larry. The reason we're calling it the CEDR data is it is a data set that was pulled out of CEDR. As far as the pedigree, I'm a little fuzzy on this and Gene started to jump in, I hope he's got some more details, more than I do. I know that some of the data was taken by Los Alamos, and then it was obtained by Colorado Department of Public Health -- maybe -- maybe Ruttenberger, I don't know.

MR. ELLIOTT: I'm fairly familiar with all of this, so --

DR. ULSH: Gene, do you have more details to offer on that?

MR. POTTER: I just was going to jump in with the observation that it wouldn't technically be correct to call it derived from HIS-20. It would have been a prior -- a predecessor of HIS-20, probably the health sciences database, given the timing of when the CEDR studies were done. But that still doesn't explain why high results would not be in there.

MS. BRACKETT: This is Liz Brackett. I actually have the CEDR catalog in my lap. It says that annual readings of whole body penetrating dose for external ionizing radiation are available from 1961 to 1989. The data from August 1976 through December 1989 were taken from computerized dosimetry badge readings provided by RFP. Data from 1952 to 1978 were abstracted from microfiche records also provided by the RFP. I -- there must be another place for internal because what it says here -- well, it doesn't say exactly where it came from, it just says the second file contains internal exposure data for americium and plutonium but not uranium. Exposures are

listed by sample date and percent of maximum permissible body burden -- which we have more than that, so I'm going to see if I can find another study in here. But it indicates that not all of the external data were taken from a database. The early years were from microfiche.

MR. ELLIOTT: I wonder if it wouldn't be beneficial to have Donna Kragle* speak to the working group about CEDR and the contents of the data for Rocky Flats, because -- I could speak to it, but I'm not confident that I know all there is to know about it. I will share what I know here, and that is that I believe it to be the case that all of the protocoled epi studies that were done on a given site, like Rocky Flats, when Laurie Wiggs* was at Los Alamos doing these kinds of studies, the data that she used in a study had to be entered into CEDR. So right there I have a problem because typically those studies only looked at white males. They didn't look at everybody. They didn't even bother to identify, in most cases, who was not monitored. They looked at monitored people. Okay? So that's my

perception -- that's what I think I understand about CEDR.

I also think that CEDR -- there's two versions of CEDR. There's a de-identified version of CEDR that anybody in the general public can get access to if they get a password and get approval from -- from -- I guess it's DOE and ORAU -- to use this information, publicly. And then there is identified data. The identified data, I believe -- and Donna would have to, you know, correct me if I'm wrong here or expound upon this, bring accuracy to it, but I believe there's more -- they put more information from a given site in a de-i-- in an identified form in the identified database. And so what the public only sees is the protocoled study data. And I think what you're seeing -- I think what we're seeing, what we're tapping into in the identified -- identifiable database is perhaps more than the study protocol, but I don't know how much more. So maybe we need to get Donna to speak about this.

MS. BRACKETT: Actually I can speak to this a little bit more. This is Liz Brackett again. You're right, and when we say CEDR, we're

actually not being technically correct. What we're using is the --

MR. GRIFFON: CER.

MS. BRACKETT: -- CER database, which is --

MR. ELLIOTT: CER database, which is the --

MS. BRACKETT: Right, which is the one you're talking about that still has the identifiers. That's the original one collected by the epidemiologists. It's not the one that actually ended up in the CEDR database that was de-identified.

MR. ELLIOTT: I would say we should be careful with the term CEDR because pe-- to CEDR -- to people on the outside, that means something different than CER.

MS. BRACKETT: Right -- you're right.

MR. ELLIOTT: We should probably stick with CER, and we should have Donna Kragle speak to us about the contents of CER.

MR. GRIFFON: Right, yeah, we probably got a little sloppy with that early on and we just kept it through the matrices, but yeah, we know it's CER. The real question is why would CER -- the CER database ever have more than HIS-20, and that's the one we can't -- that's the --

MR. ELLIOTT: Well, maybe she could help us out with that, I don't know.

MR. GRIFFON: Maybe, yeah. I could see it having less if it were only white males or only -- you know. I could certainly see it being truncated, but I can't --

MR. ELLIOTT: Does HIS-20 proclaim to have all of the data ever, or does CER proclaim to have more than --

MR. GRIFFON: HIS-20 was -- was presented to me as the prim-- more primary source. Now Gene's saying that -- that the predecessor of that might have been really where CER was derived from, but you know, the reason -- going down that path, the reasoning was -- the coworker model's based on CER, probably because you had access to that more readily than the other one. It took a little longer to get in the door or whatever. So then instead of redoing the whole model, they -- they -- NIOSH/ORAU team made an argument that it doesn't really matter, we don't need to redo all this, they're pretty close in what they're going to end up with as results. So --

MS. BRACKETT: When we started on this project

we were told that we could not have access to site databases.

MR. GRIFFON: Right.

MS. BRACKETT: That's why we were using --

MR. GRIFFON: Right.

MS. BRACKETT: -- what we could from CER.

MR. GRIFFON: Right, so I understand why that happened, but then when we asked about it, people told me fine, we'll compare it to the primary source, which was presented to me as HIS-20. Now if that's the primary source, how is it missing -- you know, so I -- I think we've been over this ground, but --

MR. ELLIOTT: Well, would it help to have Donna?

MR. GRIFFON: It may if we ask her that specific question. Maybe Brant can -- you know.

DR. ULSH: Maybe I'll just talk to Donna and --

MR. GRIFFON: Yeah.

MR. ELLIOTT: Just talk to Donna and if she can give us something -- give the working group something --

MR. GRIFFON: If she can shed some light, that'd be great, yeah, yeah.

MR. ELLIOTT: -- that'd be fine. She doesn't have to be physically present and verbalizing answers.

MR. GRIFFON: Okay.

DR. ULSH: Where are we, Mark?

MR. GRIFFON: Yeah, where are we. I think we're done with log books. Right?

UNIDENTIFIED: Bio-break.

DR. ULSH: Oh, we've got a request for a bio-break.

MR. GRIFFON: Oh, okay. All right. We're all going to go leave some bio-- no. Why don't we take a ten-minute break if that's okay -- comfort break, ten minutes. Be back at --

DR. WADE: Yeah, we'll stay on the line.

MR. GRIFFON: -- 3:25.

(Whereupon, a recess was taken from 3:15 p.m. to 3:25 p.m.)

DR. WADE: This is the conference room. We're just about ready to start. Let me ask what Board members are on the call -- on the line.

MR. GIBSON: Mike Gibson.

DR. WADE: Any other Board members?

(No responses)

Is Wanda with us?

(No response)

Okay.

MR. GRIFFON: We're back live?

DR. WADE: We're ready, we're live.

MR. GRIFFON: Okay. I think -- one thing I wanted to mention before we -- we've got hopefully just a -- just a few items left. They might be fairly large, but just a few items left. Before I -- I go into -- I just wanted to -- to touch on one point. Arjun reminded me on the break, the -- the analys-- I wanted to at least put this out as an action for SC&A that the analysis that was done on the percentages that Brant mentioned, the percentages of raw records, the number of data points you matched against the HIS-20 database, the raw records, et cetera --

DR. ULSH: This is Craig Little's?

MR. GRIFFON: Is that Craig Little's analysis where --

MR. FITZGERALD: That was mentioned earlier.

MR. GRIFFON: It's also mentioned in your -- in your SEC evaluation report. I don't know if --

DR. ULSH: Yeah, I think you're right. I think we did pull stuff out of Craig's analysis and

put it into there.

MR. GRIFFON: Right, so I would -- I would ask if SC&A can, you know, re-look at that in light of what we know now about the claimants' files and -- between last meeting and this meeting I know SC&A has spent a little time, and I -- I looked at some of the claimants' files to understand better what -- what kind of data covered different time periods and, you know, I was curious how much raw data for the urinalysis side was in the claimants' files. And it -- you know, as I said earlier, I -- I generally concluded that, you know, in the late '60s it kind of all went to printout data, which is what we're hear-- you know, it makes sense now that we're hearing from Gene that's the -- sort of what happened. They rolled over into an electronic system. So we -- we had some questions about those claimants' files, but I'd ask you to include that with your analysis. You know, re-look at that issue and see if you -- you know, I think that's one piece that NIOSH is offering for the reliability of the -- the data.

MR. FITZGERALD: Completeness of claimant

files.

MR. GRIFFON: Yeah, yeah.

DR. MAKHIJANI: Is Craig Little's report on the O drive somewhere or in a site?

MR. GRIFFON: I think it was presented at the March workgroup meeting, but I --

DR. ULSH: I know I talked --

MR. FITZGERALD: (Unintelligible) handout or what.

DR. MAKHIJANI: Could you e-mail it to me, please?

DR. ULSH: Yeah, yeah.

UNIDENTIFIED: I'm sorry, what --

DR. ULSH: I've got to e-mail Craig Little's analysis to --

MR. FITZGERALD: If you could send it to (unintelligible).

DR. ULSH: -- SC&A.

DR. MAKHIJANI: Thank you.

SAFETY REPORTS

MR. GRIFFON: And then -- so now we can move on to another item, under data reliability still, but this is the review of the safety reports, and I think --

DR. ULSH: Mark, if I could make a brief

request. Before we get into that, this will make sense in a little bit, I think -- I just wanted to go over something that I got from the petitioners. It was an e-mail from the petitioners back in February. This was after one of our working group meetings and they sent a list of 13 questions, one of which dealt with coworker data -- the question specifically asked about extremity data, but this would also apply I think to deep dose, and I'd like to just maybe discuss this for just a second. Coworker data for extrem-- this is the question that the petitioners asked. (Reading) Coworker data for extremities is not an accurate way to estimate a person's dose. In particular with plutonium, proximity is the key. One worker may get a lot of exposure during a work evolution and others may get minimal, and you have no way of telling -- telling this much later, whether the worker you are looking at had this -- had his hands in the gloves or was closest to the source, or if he was sitting in a chair around the corner writing work notes. In D&D sometimes the coworker in the same job class was not even in the pod area of the

building but was assigned the responsibility of being on the outside to get the tools, materials, parts and run paperwork approvals for the job.

So the point that they're making here -- and actually I think they're very good points -- you can't -- you have to be very careful when -- if you've got an unmonitored worker or a worker for whom the monitoring is suspect, you have to be very careful about assigning another individual worker's dose to that person. I'm not saying it can't ever be done, but you have to really be careful about how you do that. And so I thought that was a good point.

Now I think that this demonstrates a misunderstanding of how we do coworker data, and that was my response to the question, that that's -- these are good points, that's exactly the reason that NIOSH doesn't take individual coworker data. We take a claimant-favorable percentile of all the monitored workers at the site. I mean I think -- I think everyone around the table can agree that these are valid points that the petitioner is raising. I mean I don't hear any disagreements with that.

Right? And so I think it makes sense that, you know, we also acknowledge that and -- and that's why we take, you know, the 95th percentile of the entire monitored population. Now --

MR. GRIFFON: Part -- part of that is just expediency, too. I mean you're --

DR. ULSH: Exactly. Yeah, if --

MR. GRIFFON: If you had a good -- you know, if you had a larger group of all pipe fitters from one building, I think you might consider that population --

DR. ULSH: Exactly.

MR. GRIFFON: -- as more representative, so --

DR. ULSH: Exactly, sure, we could do that.

DR. MAURO: But on a one-on-one, that's --

MR. GRIFFON: I don't want to be led -- I don't want to be led down a path too far here.

DR. ULSH: Like I'm saying --

MR. GRIFFON: I got a feel -- leading --

DR. ULSH: Yeah, yeah, yeah, a little bit.

MR. GRIFFON: I was going to object to leading here.

DR. ULSH: There's a reason -- and you're right, Mark, there's a reason --

MR. GRIFFON: Yeah, I know.

DR. ULSH: But I do think that these are valid points. You've got to be very, very cautious about assigning one particular worker's dose to another worker.

And now here's the leading part, Mark. Moving on into the safety concerns, we have -- just to give you a brief history on these safety concerns and how these developed, SC&A originally became aware of these documents, these safety concern documents -- and this was a mechanism for workers to raise particular issues that they were concerned about and get management response from them. And the earliest date that we can find -- we think this mechanism came into existence in about 1970, so SC&A originally identified six or seven --

MR. FITZGERALD: Seven.

DR. ULSH: -- seven that they were initially interested in and I performed an analysis on those -- an evaluation of those, and then it was also suggested that we get the database of all the safety concerns that we could find, go through and look at the brief descriptions of those and identify other safety concerns that

might be of interest.
Well, there were about 5,000 we found, spanning 1970 up through -- I don't even know when the last one was, 2000 something-or-other. But I went through an initial pass and identified 33 of them that I thought looked to be of interest from a data integrity/data reliability standpoint. And I prepared an analysis of most of those 33, I think there might be one or two still left outstanding, and I sent that over -- sent that out to the distribution, the working group and SC&A -- oh, I think it was earlier this week, maybe Monday.
MR. FITZGERALD: A few days ago.
DR. ULSH: Yeah, a few days ago. But in the meantime, SC&A has looked at my evaluations for the first six or seven that they were initially concerned with, and I think SC&A concurred with my evaluation on five of those, but there were two that they had some problems with my evaluation. And so I'd like to maybe address those -- those two particular ones.
Okay, let me make sure I've got the right ones here.
MR. FITZGERALD: This is on page two of this

handout --

DR. ULSH: Thank you, that's a big help.

MS. MUNN: Are these the issues that were covered in your e-mail day before yesterday, Brant?

DR. ULSH: Day before yesterday -- I think it was actually Monday, Wanda, Mon--

MR. FITZGERALD: Monday, yeah.

MS. MUNN: Anyway.

DR. ULSH: Yeah, this is matrix item 30.

MS. MUNN: Ah, okay.

DR. ULSH: Okay. I'm going to go a little bit out of order. Concern -- safety concern 71-4 is one of the ones that SC&A had a problem with my evaluation on. Here is the concern as expressed by the worker. (Reading) My film badge results for December of 1970 did not show the high level of neutron exposure which, according to instrument readings and film badge results of other monitor on the same special job, should have been expected.

Okay. Now this is a concern that we have heard not only here, but it's been expressed often. This is one of the reasons that we frequently hear cited for workers distrusting their

dosimetry results. They have an impression from working in the field, based on postings of, you know, areas with dose rates, some of the doses that their coworkers got, that their dosimetry results don't accurately reflect the conditions that they experienced in the field. Now, as -- as the petitioner so eloquently laid out for us -- and I -- I've discussed this on a number of occasions in previous working group meetings, it is not reasonable to assume de novo that my film badge results should be the same as a coworker's results. It's simply not reasonable to assume that under all conditions. Now we don't have a lot of specifics in this safety concern. We don't know the particular details about where these people were working when this concern arose. We don't know a lot of that -- a lot of those factors. The only way to determine whether or not you would expect two particular workers who worked on the same job to have similar dosimetry results would be a detailed time and motion study, and there is simply no way that we can go back and do that some 30, 35 years later.

And so in my response to this safety concern,

71-4, I -- I laid out the arguments for this, that you wouldn't necessarily expect these two -- these two workers to have similar results. The fact that they had dissimilar results is not sufficient in and of itself to demonstrate a data integrity concern. And the petitioner themselves have made this point. You can't assign an individual coworker's -- I would say you have to be very careful about assigning an individual coworker's dosimetry results to an individual who has let's say suspect dosimetry results for exactly the reasons that the petitioner laid out. They may not be even in the same room. They may be different distances from the source. They may be doing entirely different duties, particularly for neutrons, which is what this one concerns. A very good shield for neutrons is any material that contains a lot of hydrogen, like human bodies. If -- if one worker is between another worker and the source, you cannot expect that both of those workers are going to have the same neutron doses. You simply cannot make that assumption without knowing the specific details.

MR. FITZGERALD: On the other hand, though, I -- I, you know, certainly agree with you in terms of -- relatively speaking, if somebody has a -- you know, say has half the neutron dose or whatever of a fellow worker, but if somebody shows up with a zero -- this is kind of the issue we've been wrestling with -- if somebody shows up with a zero reading when a coworker has a positive reading or where there's a high area readings, that's a more -- seems a more difficult proposition, one that isn't sort of a question of maybe it was geometry, maybe it was, you know, shielding. But it sort of suggests that, you know, if this person has -- is working in the same work environment -- of course that's the issue is are you in the same work environment -- how could one have a zero versus a -- presumably a positive reading through dosimetry or from area monitoring. And we have enough cases like that that that's -- I think that's the reason -- Kathy, jump in any time you want -- that's the reason we're hesitant on this one because we've heard it before and we've heard the explanation. But in the case of a -- you know,

we're looking at the systemic question, you know, the question of not any particular individual but in general if you have a number of repeated readings where you have a high area reading and a high coworker reading but an individual has zero, not just simply a portion of that reading, and we're giving the worker the benefit of the doubt, I just think somehow there's got to be a way to corroborate that -- you know, this series of readings can be attributed, as you're saying, to simply a circumstance where you would expect to have different readings. Different, yes. Zero, I -- I guess I -- I kind of pause when that -- when we're talking about zeroes. That doesn't seem credible or plausible --

DR. ULSH: Well, you make --

MR. FITZGERALD: -- although there might be some specific instances where it's possible.

DR. ULSH: You're making a number of assumptions there, Joe, that I think go beyond the information that we have in this safety concern. It doesn't say that he had zero, and it doesn't really say what dose -- what neutron exposure his coworker had. It could have been

-- I don't know what the -- what the limit of detection on neutron dosimeters was at that time. I don't know, but let's throw out a number, let's just say 40 millirem.

MR. FITZGERALD: Yeah.

DR. ULSH: One guy has 40 -- 45 millirem. The coworker's -- the guy with the concern comes back zero. All you know is that it's less than the detection limit. It could be 38. We don't know.

DR. MAKHIJANI: Do we have -- we don't have the names of these people?

DR. ULSH: Yes, we do. I don't want to say them out loud.

DR. MAKHIJANI: Yeah, no, but I'm just saying I think -- I think --

DR. ULSH: We have the name of the individual who filed the safety concern.

DR. MAKHIJANI: Filed the safety concern --

DR. ULSH: We don't have the name of the coworker.

DR. MAKHIJANI: -- and do we have some tracking on that safety concern and the job that they did. A couple of the explanations that you gave, Brant, are not applicable to this safety

concern 'cause they said it was the same job at the same place. So the shielding part may be -- they said it was the same job. Right?

MR. ELLIOTT: But that may be interpreted, Arjun, as they were working on the same project. Maybe not -- they didn't have the same functions.

DR. MAKHIJANI: It says the same special job.

DR. ULSH: It says (reading) My film badge results of other monitor -- I assume that's a typo -- other monitors on the same special job should have been expected.

DR. MAKHIJANI: Right.

DR. ULSH: But again, you don't know the details of -- of this in terms of --

DR. MAKHIJANI: No, I don't know the details. All I'm saying is that -- that the -- the two things -- and this -- this should be done in the other cases, too, the -- the famous eight rad stacker thing --

DR. ULSH: Yeah, we'll get to him.

DR. MAKHIJANI: -- where we've come across the same issue, is we -- we need to -- we need to go back to the original record, if possible, of the people involved and look at their doses --

especially here -- and then if possible just talk to the person as to -- as to what they were doing. It -- it should -- if -- if that is possible.

DR. MAURO: I would take a different tact. If I were trying to -- to convince this person that everything is fine, I would go back and say well, we -- we looked at your exposure records for these five or six months -- let's say it's a monthly -- were these monthly? -- or whatever they were, and then -- and his -- and his friend, his buddy, and look at him. And say by the way, the previous month you got the dose and he didn't.

DR. ULSH: We don't know who his buddy is.

DR. MAURO: He -- he won't tell us?

DR. ULSH: Well, all I'm saying is the safety concern -- we don't have -- we don't know who it is, it's not named.

MR. FITZGERALD: It's not in the documentation.

DR. MAURO: You see what I'm getting at? Again, it's -- it's sort of like if I were him and I -- I could easily see me being that person, and if -- and if you -- I asked you is this -- what do you do to convince me that

everything's okay, I would say oh, yeah, and the month before that it went the other way. Other words, we -- you weren't --

MR. FITZGERALD: Yeah.

DR. MAURO: You know, and I would say oh, okay, and that would be the end of it -- if I was him. I would be convinced with that. Now I don't know whether that's true, but that's something that could be done.

DR. ULSH: Well, yeah.

DR. MAURO: The thing (unintelligible) we're trying to convince him that everything's okay, and if we can convince him, then for all intents and purposes, we have also convinced ourselves.

DR. ULSH: Well, again, the only way to answer this definitively is, like I said, to have a detailed time and motion study so you would know whether or not to expect them to have the same results. It could be that the month before they were doing totally different jobs.

DR. MAURO: I don't think you can do that.

DR. ULSH: I know you can't. That's my point.

DR. MAURO: I wouldn't even try to do that.

MS. MUNN: Brant -- Brant --

DR. MAKHIJANI: (Unintelligible) a detailed time and motion study (unintelligible) straw man. We know it can't be done. The -- but -- but you can try to locate this person and -- pick up the phone and call them and see who the buddy was --

DR. MAURO: Yeah.

DR. MAKHIJANI: -- and what was the evolution of this and go back -- try to go back to their records. Now if you can't, you can't, and you can't actually take it farther than the argument that you've done -- that we're doing at this table. But I think it is possible to take it considerably farther, simply by identifying these two people and going to their dose records.

MS. MUNN: I can hardly hear you, Arjun.

DR. ULSH: Oh, you're in the -- you're in the (unintelligible) now, too.

DR. MAKHIJANI: Can you hear me now?

MS. MUNN: Yes, I can hear you better now.

DR. MAKHIJANI: I'm sorry, I was hiding behind my computer screen. I said that most of this can be addressed by identifying the two people and going to their dose records. We know who

one of them is, so --

DR. ULSH: Yeah, I -- we can look at the -- I can very easily go to this particular badge exchange cycle and tell you what the dose was for this individual named in the safety concern. In terms of identifying his buddy, well, number one -- I mean yeah, we -- it's a question of how far we're going to pull the string here, and I think we need to look further down the road and see what these things that you're proposing are going to get us. Let's say we talk to the guy who filed the safety concern -- if he's still alive and we can locate him, we could try to contact him. We could say tell me where you were in 1970 when you filed this, tell me who -- who this person is that you're concerned about. Then we track -- try to locate that person. At the end of it, you might be left with -- you've got -- okay, best case scenario, you've got two rad files. Now what are you going to find in the rad file? You're going to find the individual's dosimetry results for these time periods. It might be exactly what you say, John. The month before, they were --

DR. MAURO: Reversed.

DR. ULSH: -- they were reversed. But even there we don't know if they were on the same jobs at that time.

DR. MAURO: It may turn out they're not reversed.

MS. MUNN: The bottom line is, no one can make a valid assessment without more information than is given in the safety concern.

DR. ULSH: And given that, I think then -- I think we can all agree with that point. Given that, my question is how far does the working group want us to pursue this, particular -- this particular example.

MR. FITZGERALD: If I could make one comment on this, it strikes me we're -- we're sort of in that boat (unintelligible) reminds me of the discussion on the '69 data -- missing data. You know, certainly on one end of the scale you can deal with reasoned hypotheses. Okay, we've gone through a series of hypotheses to explain why we're seeing the phenomena or the zeroes that we're seeing in '69, for example. You can go to the other extreme. In this case we're talking about, you know, the impractical time

and motion studies. In '69 I'm sure there's another very comparable extreme you could go to to nail that to the ground. But I don't think any of us are talking about that. We're saying is there anything beyond a reasoned hypothesis as the response to some of these fundamental issues raised in data reliability. And if you can take it, you know, one step further than the hypothesis, meaning a reasoned judgment without any corroborating facts, then I think, you know, we should take a hard look at what is that intermediary step or something that's further than the hypothesis. And in this case I think it's certainly possible maybe to go and get a little bit additional data. Otherwise I agree with what Wanda's saying. You know, if you are operating in the confines of the safety concern, all you have is a hypothesis, which, you know, for purposes of the context of an SEC discussion, you know, I think we have to really scratch our heads and decide if that's sufficient. It may be necessary, but is it sufficient. So I don't know.

MS. MUNN: But Joe, my -- my concern with SC&A's failure to accept this explanation lies

partly in the resolution that was given at the time, that the employee's supervisor talked to the employee about this and the indication is that the employee was satisfied with the discussion afterwards and understood what had likely transpired. Then it's difficult for me to understand why this is becoming a flashpoint for us in disagreement now, especially since I -- I do not even know whether this individual is a claimant.

MR. GRIFFON: Again, I don't -- that's why I -- I asked that we consider some of this stuff in aggregate rather than one -- picking apart one case at a time. That -- you know, we can pick apart most of these cases individually, but I think if you've got -- we've got a number of -- of concerns expressed in different forms, in safety reports and affidavits, et cetera --

MR. FITZGERALD: Right.

MR. GRIFFON: -- about the data and the fact that their -- their record was less than they believed they received. And you know, I -- I think my -- you know, this question of -- I think you have to go back to -- I do like the -- the -- and I know you're going to get to the

stacker-loader case, but I mean I think that the workers do have -- did have a sense of the, quote/unquote, hot areas when they were working in them. And --

MS. MUNN: They certainly should have.

MR. GRIFFON: Right, and especially the RCTs, so you know, when -- when -- when that RCT expressed a concern about their exposure and gave some very specifics about the fields in the area, I think just to kind of pick that one apart and dispose of it, I wonder if that's appropriate, especially if we're getting a number of these. So I would -- I would say let's -- that's why my approach more is to step back, given all these concerns expressed. We've laid out this methodology to test the reliability of the data used in all the claims cases, and -- and you're not necessarily responding to any individual claimant's file when you're testing the claimant data available for the Rocky Flats site in general. You know, that -- that's how I've been kind of envisioning it instead of -- I can -- you know, again, I agree with Joe that, you know, you can hypothesize what might have transpired in each

individual case, why a dose might be different for two coworkers, et cetera. But given -- given the level of interest expressed in the petition and elsewhere on this issue, I think the answer is NIOSH is taking this very seriously and wants to address the overall reliability of all data being used in -- in all claims cases -- in a general sense, to make sure there's no systemic problems.

MR. ELLIOTT: I'm glad to hear you say that.

MR. GRIFFON: Well, yeah, yeah, I think --

MR. ELLIOTT: 'Cause we can have infinite scenarios, we're running around trying to figure out what happened.

MR. GRIFFON: These were useful to express the -- the -- the specifics of the concerns.

MR. ELLIOTT: I think -- you know, the tension here, as I see it, we -- we want to be responsive and address the affidavit allegations that have come forward.

MR. GRIFFON: Right.

MR. ELLIOTT: But --

MR. GRIFFON: We can't answer each case.

MR. ELLIOTT: -- we can't answer every one because there'll be a host behind each one of

those --

MR. GRIFFON: I agree.

MR. ELLIOTT: -- that are going to expect a similar amount of effort. What -- what I hope we could do, same as what you just said your vision was, can we identify the salient issues here, the --

MR. GRIFFON: Right.

MR. ELLIOTT: -- categorically can we put those together --

MR. GRIFFON: Yeah.

MR. ELLIOTT: -- and knock them down as a category or say no, there is something there, there's a problem there, and the problem -- and it goes back to we have to rub off what we are doing here against the -- the acid test is there -- is there a data reliability issue that prevents NIOSH from achieving sufficiently accurate dose reconstruction. Is there -- is there a data reliability issue here that presents an inability for us to cap the dose --

MR. GRIFFON: Right.

MS. MUNN: Is there --

MR. ELLIOTT: -- for an SEC petition --

MS. MUNN: -- a pervasive --

MR. GRIFFON: And it goes --
MR. ELLIOTT: -- or for a group of workers.
MS. MUNN: -- systemic (unintelligible).
MR. GRIFFON: -- it goes back to -- I mean I -- maybe -- maybe in the workgroup process we've -- we've missed -- misled -- I don't know, I didn't think --
MR. ELLIOTT: No, no, I don't --
MR. GRIFFON: -- but I think we wanted to be responsive to all the concerns expressed in the petition, but that didn't mean that each one had to have an individual response, you know, that you can -- some of these are very similar, and I think grouping them makes sense. And you know, I think a response that a lot of these people -- I mean, you know, we -- we had Jennifer Thompson on the phone -- I'm getting confused now what day, but about her particular case, and basically she said, again, this is not about me and my 54 millirem that I think was missed or whatever -- or missing or whatever was the issue with the 54 millirem. I just bring this up as an example of what I've heard from other people that were represen-- you know, that she has named petitioners

representing. So I think NIOSH's response should address the broad issue, not every specific claim. And hopefully you can -- you can sort of -- in those -- in those responses you can reference the individual affidavits that were brought out in the petition and say, you know, this is in response to, you know, this list of people that have, you know, concerns about this kind of issue, not that you're looking at each individual case -- 'cause I think you could go down that path forever and you're never going to satisfy those, either, so...

DR. ULSH: So -- so Mark, just to clarify then, I -- I understand what you're saying. With regard to this particular safety concern, Mark and Wanda and Mike and Bob, if you're out there, do you want to see more action on this or do --

MS. ROBERTSON-DEMERS: We want to see more action -- this is Kathy -- from a general sense, and that's why I felt it was applicable to the SEC petition. If you -- if the workers don't believe that their -- their dosimetry results, in general, then explain to them why

they were zero. And you -- and -- and you've got the explanation in your head because you just stated it at the beginning of this issue.

DR. ULSH: It's in the evaluation that I prepared for the -- for the safety concerns. I mean I -- I laid this out in my evaluation of this particular safety concern. And so my question then is --

MR. GRIFFON: Right.

DR. ULSH: -- given what you've just said, do you want me to pursue this further or just address the more general issues. That's what I'm asking.

MR. GRIFFON: And I --

MS. ROBERTSON-DEMERS: You want me to vote, Mark?

DR. WADE: No, this is not your question.

DR. MAURO: No, this is -- this is a Board question.

MR. GRIFFON: Yeah.

MS. MUNN: My personal preference would be to address the general issue, because this is not even a site-specific issue. This is a complex-wide issue, and the issue is essentially always the same. My badge doesn't look like -- my

badge readings do not give me the same report as I believe my coworker received. And this is not going to be an issue that's going to go away. If we cannot adequately address it, then we need to say we can't adequately address it. I believe that we can, and I believe that --

MR. GRIFFON: You believe that we can -- can't hear you, Wanda.

MS. MUNN: -- (unintelligible) reasonably good job of beginning to do that.

DR. WADE: Say we believe she -- we can and we're doing a reasonably good job of beginning that.

MR. GRIFFON: Yeah, I -- my opinion is I don't want you to look at all these individual cases to prove back -- I don't know that I would say don't look at any of them, but I would say don't look -- certainly we don't want to look at all.

DR. ULSH: Well, the --

MR. ELLIOTT: So we may look at -- we may -- Brant may look at some --

MR. GRIFFON: Pull the string on a few --

MR. ELLIOTT: -- in order to --

MR. GRIFFON: -- on a few that -- that --

MR. ELLIOTT: -- to show other -- in defense of -- of what we've done or to support --

MR. GRIFFON: Right.

MR. ELLIOTT: -- what is being alleged.

MR. GRIFFON: Right.

DR. ULSH: Okay. So given then that -- I know you guys haven't had time to review this yet --

MR. GRIFFON: And you may have done that to some extent already, the -- the stacker-retriever person, that string has been pulled quite a bit, so that -- that's a -- that's a prime example I think 'cause there's a lot of rich information in that affidavit and --

DR. ULSH: Very specific information we can check.

MR. GRIFFON: Very specific, right, right. So that's the kind of one that I think might be fruitful to pull the string a little bit. But otherwise, I agree with Wanda. I want to -- we have to answer the general question. You know, is the data reliable, as best as we can check and determine, you know, over the course of time at Rocky 'cause this covers the whole span in Rocky Flats, the petition, over the course of time for all areas, is the data reliable.

That's the question we have to focus on.

DR. ULSH: And when you're saying address that more general issue, it deals with the things we've already talked about --

MR. GRIFFON: All those --

DR. ULSH: -- the log books, things --

MR. GRIFFON: -- all those columns that we're talking about, log books, urinalysis books, et cetera.

DR. ULSH: And I know you haven't had a chance to review the evaluation of the first 33 safety concerns. I will prepare a similar evaluation for the next 16 that SC&A -- have we already talked about that today?

MR. GRIFFON: Yeah -- no, those --

DR. ULSH: SC&A also proposed 16 additional ones to look at in a similar manner to the way that we've done the first 33, and I'll go ahead and do that.

MR. GRIFFON: And if -- I don't know -- I asked this during the break, but is there -- are there categories of these things? I mean one category here is -- is they don't believe the dose they were assigned.

MR. FITZGERALD: Well, another one --

MR. GRIFFON: That probably covers several people.

MR. FITZGERALD: -- neutron blackening, what -- I think that's something he actually sent us a e-mail on.

DR. MAURO: This is a very, very important conversation we're having right now.

MR. ELLIOTT: Yes, it is.

DR. MAURO: I think -- I think we're finally star-- it's emerging from the process and this is the way it's supposed to be. What's emerged from this process is the realization that we're not going to chase -- and we really -- there is no -- there's no great value to chase every allegation on a particular case. When they come in, we -- the process is to use that as a way to start to categorize areas of inquiry that have broad-base implications regarding data reliability. It's a process. We actually are now building a process. The light just went on, 'cause I don't know if you recall, there was a time that I was sort of thinking different. I was thinking well, you know, we have an obligation to these individuals to try to help -- no, I -- I was just convinced the

way you said -- use these individual cases --
MR. GRIFFON: I think we have a obligation to be responsive, but --
DR. MAURO: Yeah -- yeah, but --
MR. GRIFFON: -- the way you respond is different, right.
DR. MAURO: -- I mean -- yeah, responsive, but not the way --
MR. GRIFFON: And I apologize if I haven't been clear with that. That's kind of the way I've been seeing it for a while.
DR. MAURO: Yeah -- no, no, I -- I think that there's a process that just emerged from here which is -- which will satisfy the individual affidavit, but in the process of satisfying that, we're going to satisfy the other thousand that go along with that, that are -- that -- and I think that that's how it -- you know, that's how we'll build -- this emerged right from this conversation when a light just started to go off in my head.
MR. MEYER: You know, if this is a complex-wide issue -- which a lot of these probably are, a number of them are, as Wanda had said -- it's probably up to the Board to establish the

category --

DR. MAURO: Absolutely.

MR. MEYER: -- and the specific example that maybe each group has to track on their own, but -- or maybe it's just track once, I'm not sure.

DR. WADE: And the Board has -- to the Board -- the Board did have a work-- working group that looked at this -- this broad issue of criteria to be considered when evaluating an SEC petition, and it was NIOSH's burden then to present. So I think that work has already been done. I think in each individual petition, based upon the petition itself and based upon the digging that SC&A does, certain issues emerge. Clearly for Rocky Flats, data reliability is an issue, and these are some of the characteristics of the issue and it needs to be addressed. The Board has provided guidance and the working group guidance. In some cases it doesn't raise as high as an issue, but in this case it has, and the petition does it and the SC&A report did it. And I think now it needs to be put to bed, but it needs to be put to bed systemically. You can't chase these things.

MR. ELLIOTT: If it's a general issue across sites, but it's not -- in the context of its issue at a given site, it can be different.

MR. GRIFFON: Yeah.

MR. ELLIOTT: You've already pointed that out. Y-12 was substantially different in doing what we were doing than we are here at Rocky.

MR. GRIFFON: I was going to say it takes a little different form on each -- each place we go. Mallinckrodt --

MS. MUNN: It was, but the basic question was the same.

MR. GRIFFON: Yeah.

MR. FITZGERALD: And I would say at Rocky you're going to have certain categories that'll be very distinct and you're going to hear those issues perhaps more frequently. I think this one about zeroes and presumed places of high exposure and blackening of badges, for example, are two that you hear repeated fairly often.

MR. GRIFFON: I agree.

MR. FITZGERALD: And there's going to be some others that will be very infrequently you'll -- you know, so I think certainly those broad areas need to be --

MR. ELLIOTT: And certainly those broad areas have perhaps the most impact if -- if they become, you know, an issue -- in capping dose or in reconstructing dose -- that -- that covers a breadth of the claimant population.

DR. MAURO: And this is going to carry over to other sites.

MR. ELLIOTT: Yeah.

DR. MAURO: This process we're building right now is going to carry over to other sites. This is -- this is important.

DR. MAKHIJANI: I have a procedural question about -- and maybe Dr. Wade or Lar-- Larry, you could illuminate this -- is the -- in the specific instance, NIOSH, in the process of, you know, evalu-- qualifying the SEC petition, elicited more information from the petitioners. And a very large part of what we're dealing with is -- it's 500 or 700-odd pages -- is the information that was given by the petitioner in response to NIOSH's request, which consists primarily of these affidavits. And I agree, you know, some of these individual things at the anecdotal level don't resolve the larger issue, even if you trace them down. But if you

do it in the reverse, if you say okay, we've looked at the 90 percentiles and that was okay for Y-12; in Y-12 we didn't have affidavits from individual petitioners, what is -- what's the bar in terms of responding to the petition, especially procedurally. So I may be, as a scientist, satisfied that the quantity of data available is okay and the integrity of the data, you know, it matches in sufficient numbers. How do you go back from that and speak to the SEC petition, especially when NIOSH has elicited the information? That's -- that's part of the reason why I've been feeling a value in this process in this particular case, whereas it didn't come up in Y-12, is because we've got these affidavits in the petition. And so it's a little bit procedurally difficult.

MR. GRIFFON: Well, I think -- isn't -- isn't part of the reason you have all these affidavits is 'cause you did go back -- I mean went back and asked for more information to support certain claims within the original petition -- right? Is that -- is that correct, or -- I'm not sure of the history --

MS. JESSEN: Can I step in here?
MR. GRIFFON: Yeah.
MS. JESSEN: This is Karin. In the original petition there were statements from different workers that had made their statements, but in the rule it does say that if you're going to make those statements you do have to provide an affidavit. So in the second group of things that came in from the petitioner, the 500 pages, most of those pieces of information from the workers that were in the first petition, if you will, showed up in the second petition as an affidavit.
MR. GRIFFON: Okay.
MS. JESSEN: So a lot of the information was the same, it was just the behind-the-scenes paperwork --
MR. ELLIOTT: The formality of it.
MS. JESSEN: -- the formality that we needed the affidavit. There were several additional items that were provided regarding the second petition that came in, or the piece of information that came in, but there -- there was some overlap.
MR. ELLIOTT: That's absolutely --

MR. GRIFFON: That's a good clarification, yeah.

MR. ELLIOTT: -- right on, but I think Arjun raises a very good point, because this petition and the fact that we have these affidavits -- heavily loaded with affidavit concerns --

MS. JESSEN: I think there's like 22.

MR. ELLIOTT: Yeah -- how do we go about, you know, responding to those -- to those individuals. They've had -- they have some ownership here. They've vested themselves this way.

MR. GRIFFON: That's a good point.

MS. JESSEN: And one of the things that I would like to clarify, in the evaluation report we did respond generically, if you will, to the concerns that were brought up by the petitioner in the affidavits. That was responded to in the petition (sic). One of them was lead aprons, the other one -- I don't remember all of them -- inaccurate exposure, but you know, the whole thing. All of the issues were addressed as presented in the petition, and we did respond to that in a general way, which was NIOSH's job to do -- because remember, we're

looking at a class and we're not looking at individuals. And we have pulled the thread and gone a little bit more with these 41 examples in the data integrity. We have -- we have done that. We have tracked back to that. So I think with regards to our discussion here, the evaluation report was presented in a way that NIOSH felt it should be presented based on the rule, and then with the working board, you know, requests, we have gone back and pulled some of the strings and answered those questions specifically.

DR. WADE: All right. Do you want to answer Arjun's -- or you want me to --

MR. ELLIOTT: Well, I'd like to go on a little bit and add to what Karin just said. I certainly think that our evaluation report had to take a stand or establish a position, and was already late. We were overdue. As we go into future evalua-- wasn't it late?

MS. JESSEN: No, it was --

MR. ELLIOTT: No, it was not?

MS. JESSEN: -- it was early.

MR. ELLIOTT: It was early, okay. My -- I'm getting it mixed up with another one --

DR. WADE: We've been late enough.
MR. ELLIOTT: I'm getting to the 180-day thing. As we get into petitions -- as we get into petitions with a 180-day time frame to turn around, we're not going to be able to dig as deeply as this working group has dug --
MS. JESSEN: That's true.
MR. ELLIOTT: -- and SC&A has dug.
MS. JESSEN: That's true.
MR. ELLIOTT: Okay? So that's up front. Now how do we respond to these affida-- I'm sorry, I got this one mixed up with another one in my mind that -- you know. Just to let y'all know, I'm monitoring this 180-day thing pretty closely, but I'm not on top of which ones are going through the system (unintelligible). But how do we respond? You know, I think certainly this -- this whole deliberation of the working group -- and SC&A's efforts as well contributing to that -- is one way that we -- we speak to these issues. We have a transcript. We are on the record. But that doesn't get back, in my opinion. These folks are not going to pick up these transcripts. They're not going to listen in, as you can

tell, every day to these working group discussions. And so I think we owe -- at the end of the trail here, we owe the petitioners and those who contributed to the petition an explanation of what has been developed through this deliberative process and what understanding has been arrived at, whether it's the position we originally took in the evaluation report or whether that -- on a -- on a given issue, or whether that position has been modified because of the deliberative process. I think we have to go back. Now how that happens, I don't know that we have a clear sense -- in my mind or anybody else's mind -- yet how we -- how we make that happen.

DR. WADE: Yeah, I mean I would add a little bit. I mean it -- and they're two separate issues. They're both important, but they're very separate. The primary issue that NIOSH is concerned with and the Board is concerned with now is that we have an SEC petition. We presented an evaluation report. We need to be sure that that evaluation report scientifically addresses the concerns as well as they can, and the Board will comment upon that. And that's

the primary activity.
NIOSH is left with another burden, which is the burden of good communication to the people that it serves. That's even -- may be a greater challenge that we face is to -- how do we deal with these people who have raised these issues. How do we -- how do we allay their concerns and fears, and we need to work very hard on that, but it's separate and apart from the evaluation process. And I mean I think we have to -- we have to keep --
And the Board has to realize that its responsibility is to oversee the scientific quality of what NIOSH does and make a recommendation to the Secretary, and -- and that needs to be the focus of the Board's activity.
We welcome all the advice that you'll give us on how to deal with this communications dilemma that we have, but that's a separate issue than the issue of coming to the right evaluation report and the Board coming to its judgment.
MR. ELLIOTT: We may never be responsive to everybody or allay anyone's concerns or fears, but we at least owe them an honest, frank,

candid communication about what has happened, what -- where we're at at the end of that trail.

DR. WADE: And I would also then add a little bit of editorializing. I think SC&A and the working group has served the process extremely well on both fronts, and yet you have to keep the issues separate.

DR. MAURO: I've got one other -- another facet to this, and that is -- a model just took form in my head and I like when this happens. The idea that the --

MR. GRIFFON: I think we do, too, John. We'll let you know in a second.

DR. MAURO: Well, what I see is okay, good --

MR. GRIFFON: Is this a tree with balloons?

DR. MAURO: What we have here is that okay, these affidavits come out, the petition's out, and somehow imbedded in that we allow -- form -- something to take form. Okay. We're going to have to -- like -- as you pointed out, the blackened film badges, the lost film badges -- other words, you can start to just start to see -- what emerges -- you just have to sort them into categories, you've got a bunch of bins

now. Okay? And you say now if we could put each one of these bins to bed -- you know, we do two things. One, we've convinced ourselves that the data's reliable and second, probably in the process have convinced the -- the person who filed the affidavit there's good reason to believe that we've got this thing -- we understand it. But here's where we really are right now, and I don't think we realize we're at this place. We think somehow these -- these different categories of documents, these log books, the foreman's reports, these -- or the Kittinger report -- other words, we've got -- we -- what we have now is -- the real dilemma we have now is there's all of these categories of information that are recorded away, apparently vast amounts of information, and what we're -- I could see that we're struggling with is my God, how do we get at that stuff to help us say something intelligent about -- about each of the bins and where -- is there -- is there information in there is not -- I -- I think we're -- we're in a pro-- we're in what I would call a chaotic phase. I like -- I like -- we're in a chaotic phase right now. That's

okay. Whereby we're pulling -- we're pulling scope -- you know, different log books and we're looking at them, we try this, we see a title, let's pull it and see what it tells us and -- and it's almost like we -- we're not quite sure whether or not it's going to serve us well. And I think that's the part of the process we're in right now, and that's okay. I'll be frank, I think we're a little bit lost at sea in there somewhere. That is, where is this stu-- you know, is it going to help us. We don't know yet. But I think that when we're through with the process that you're in the middle of right now, and I guess, you know, some degree of frustration trying to find the gold inside this mountain. But when we're through with that, we're going to have -- we are going to have built a process that's going -- that -- that probably has an -- is going to be analogous to many other sites. So even though it's -- it's painful right now, I think we've got to go through this process and find out where -- where it takes us.

MR. GRIFFON: I don't see this data validation -- at least -- other than the individual cases,

I see it very similar to what we did at Y-12, for those of you who dug through records. I mean I -- you know, we did a lot of the same (unintelligible).

(Whereupon, transcription of comments by speakers at the table was rendered impossible due to telephone interference.)

DR. WADE: Okay, it went away. Wanda, are you there?

MS. MUNN: Yes, I am.

DR. WADE: Mike, are you there?

MR. GIBSON: Yes.

DR. WADE: Good. Thank you.

MR. GRIFFON: You know, it's not like you have, you know, okay, here's our master set of raw records here and here's our electronic database here and we just have to samp-- you know, come up with a sampling strategy -- stratified sampling strategy and do it that way. It's not -- it's not -- we don't have that, so you have -- you have little bits and pieces and you get at it that way. We did the same thing at Y-12.

MR. FITZGERALD: I was going to say, it wasn't clean in the beginning, though. Each site's a little different, and this site differs from Y-

12 because when we went to the petitioners and went to the people that had the affidavits and allegations and said, you know, this did-- you know, we understand what you're saying, but there doesn't seem to be any corroborating evidence, where can we find this -- they weren't giving us anything, no documentation to back it up. They (unintelligible) the safety concerns log books, but not with any specific references. So to some extent we had a sampling issue from the very get-go, and I think that's where -- you know, where we are now. How do we sample this vast amount of information when they did not have a specific date, reference -- nothing, which is kind of surprising, but that's kind of where we are.

DR. WADE: But the other thing -- you know, I agree with everything except that it's okay. I mean you have to look at some other things. I mean there -- there's a great deal of pressure on us all to act in a timely way. I don't have to tell you that every week I'm reminded that people are dying while we do this. So we have to -- we have to decide how we want to approach this and it's -- it's not an easy process, and

I applaud the work that's been done to this point. But we just can't do it forever, so --

MR. GRIFFON: That's what I'm saying. We -- we may -- you know, we may -- I guess we're -- you know, we learn as we go, but we may get a generic lesson out of this, which is that, you know, we really have to, you know, focus on the class and those issues rather than -- you know, these examples are great 'cause they're very -- well, you know, they sort of define the problem, you know. But then you have to step back and say okay, how does that affect the whole class, and I think we might have spent a little too much energy on -- on each individual -- maybe not -- maybe not.

DR. WADE: Three things happened --

MR. GRIFFON: Anyway --

DR. WADE: Three things happened at Rocky Flats, it seems to me, but -- the nature of the petition itself, the history of the site in terms of the FBI and raids and all of the concerns. NIO-- I mean SC&A's initial digging in where they said there -- there's something here -- I mean that elevated it to the level where it's taken the attention that we've

brought to it, but we need to realize that while we're doing this, you know, literally there are people dying and -- and that's a concern --

MR. ELLIOTT: It seems to me that if you look at our evaluation report and you look at Section 7.5 where we attend -- or attempt to attend and address the affidavit issues, the issues that are raised not only in the original petition, but then those that are -- come back and supported by affidavit, can we -- can we look at those in the context of -- of has anything changed from where we're at, from our evaluation report, to the work that has been done, the deliberation that's been given, would we modify anything that we have to say now, would we augment it, would we add to it, would we -- would we change our -- our thought, our position that is stated in that evaluation report.

MR. GRIFFON: See, that -- that's -- that's part of where I was going with the too much time spent on individual cases 'cause I think we've neglected the broader issues for a while and that's a little bit of my frustration

coming into this meeting is that some of the -- the tasks that I thought would be moved quite a bit further along have sat idle while other tasks have mushroomed into much bigger things than I ever thought they would be, so I -- I -- I don't know that we've changed. I'd have to look at that, but I -- I know a lot -- the other way --

MR. ELLIOTT: Well, I'm not saying that for you. I'm --

MR. GRIFFON: No, no, I -- yeah, yeah --

MR. ELLIOTT: -- saying that for NIOSH and the ORAU team.

MR. GRIFFON: I mean I don't know that we would have made a persuasive argument to make you cha-- you know, for you to want to change that section yet, but I mean I think one big issue is the other radionuclides and we're still -- at this point haven't seen a report in front of us and that's a little bit of frustration on my -- you know, 'cause I feel that time pressure, too, especially coming into the Nevada meeting, you know, and having to face the petitioners again.

MR. ELLIOTT: Well, my -- my pressure is not

only hearing people say, you know, people dying all the time --

MR. GRIFFON: Yeah.

MR. ELLIOTT: -- you guys are debating this, but the other pressure I feel is making sure that we apply the resources that we have in NIOSH and the ORAU team appropriately and -- and I'm concerned, too, about the other radionuclides and where we're at and how much time can we spend on that given we're, you know, chasing down log books here, there and -- and trying to figure out what benefit or merit they have to answering a question on reliability. So you know, I think we need to have very clear guidance from the working group, from the Advisory Board, on how you want to approach this. How do you want us to proceed. What -- what -- you know, what focus do you want us to give a particular over-arching issue, like data reliability. How do you want us to tackle that. How do you want us to tackle some of the other issues. That's where I'm at today. That's why I thought I'd better attend the meeting and see where we were going.

MR. GRIFFON: Well, I think we've -- I -- I feel like we have a reasonable path forward for the data reliability question. I feel like we shouldn't -- we haven't reviewed this safety concerns report, but I would say, as far as pulling the string on any individual case, I would definitely hold off on that at this point. If SC&A reviews this and finds one or two or something that, you know, they see some merit in pursuing further, then that -- you know, I would leave it open for that. But otherwise I would say we need to focus on the -- the log books and these other checks -- to check the reliability of the -- of the data within the claims files.

MR. ELLIOTT: Speaks in a general sense to data reliability --

MR. GRIFFON: Right.

MR. ELLIOTT: -- but in a --

MR. GRIFFON: And we haven't had --

MR. ELLIOTT: -- specific sense to an individual's concern.

MR. GRIFFON: I mean I -- you know, I hear people asking me well, what do you want us to do. Well, at the last meeting it was agreed

that NIOSH would come back and propose a methodology, and I was hoping that the methodology proposal would come between these two meetings via e-mail and then -- you know, so we wouldn't hold those up, but we haven't even got a methodology -- and I know Brant -- Brant's saying partially because, you know, they just haven't found a lot in the log books so they -- you know.

DR. MAURO: Well, where we are now, we've got a thousand documents -- at least a thousand -- I mean --

MR. MEYER: It is, I just got the estimate back from Scott.

DR. MAURO: Okay, now we've got a thousand (unintelligible) this important place, we're at a milestone as far as that, but we have a thousand documents that cover a broad range of activities and time periods at the facility. And in theory, imbedded in this -- and I don't even know how many pages a thousand documents are, it maybe 10,000 pages, maybe 100,000, I don't know, but we're operating from a perception that someplace imbedded in that -- in those -- those pages is information that's

going to give us some insight into each of those bins that we've created in our minds. We don't know if it -- it does or it doesn't --

MR. GRIFFON: But -- but -- but we do, to some extent. I mean I --

DR. MAURO: To some extent, okay. I guess I --

MR. GRIFFON: Yeah, I mean we have examples. It's not like we're (unintelligible) at this point. We have examples that some logs have information in them and we're going to provide that to NIOSH, titles that Bob read off the spreadsheet said, you know -- some of those at least said urinalysis records. That -- that gives me an indication that yeah, there might be something there -- there, you know, it's not a worthless goose -- you know, a wild goose chase on (unintelligible).

DR. ULSH: It's clear that the urinalysis logs --

MR. GRIFFON: Right.

DR. ULSH: -- but no one I think would say that those are going to lack value, that's -- that's clear.

MR. GRIFFON: But -- if -- he was talking about other records that contain urinalysis data, I

think --

DR. ULSH: It may not be log books.

MR. GRIFFON: Yeah.

DR. ULSH: It may just be other raw records of urinalysis. That's -- that's clear.

MR. GRIFFON: So I think if we can cover the time periods with these urinalysis raw records, then -- then you -- you've got this semblance of a methodology --

DR. MAURO: Yeah.

MR. GRIFFON: -- there, you know.

MS. MUNN: But folks, this -- this basic question has not changed from the outset, and the basic question still is how much is enough to satisfy this Advisory Board on the verifiable nature of the data that's available. It's never going to be perfect. The information that we have is never going to be perfect. There are always going to be single instances that we can find where things don't match perfectly because none of the information that I have ever seen anywhere about anything is ever going to be perfect. So our job, as I see it, is an enormously difficult one. It's to answer the question how much is enough. We

can go on with this forever, but someone -- and I think it has to be the Board -- must say this is enough. This is adequate. The job can be done with the information we have.

DR. WADE: Or correspondingly, there are enough open issues that we can't make that judgment. So the Board has to come to a decision. I mean I -- just again, to get over -- slightly beyond my role, I mean I think this overview of data reliability and how it's put to rest, and I think the other radionuclides issue, those are -- those are the big issues that are left before this working group, and we need to tee them up as quickly as you can.

The other things we've been talking about are interesting --

MR. GRIFFON: It shouldn't have been a surprise, given our Y-12 deliberations.

DR. ULSH: Well, I would like to clarify that the first time that -- that I recall, at least -- the other radionuclides issue being asked was in a write-up by SC&A two working group meetings ago, I don't know, I don't -- I don't remember the exact date.

MS. MUNN: Three working group meetings ago.

DR. ULSH: Okay. At the last working group meeting we gave the oral presentation. The written report is going to be in your hands -- barring classification issues -- very, very soon. So at least on that one, I think --

MR. GRIFFON: Right, right.

DR. WADE: Well, no need to be defensive. I mean this is really --

MR. GRIFFON: No, no, I'm not pointing -- I'm -- also -- Wanda, to your point, I mean I just think, you know, how much is enough, we do have to keep that in mind all the time, but --

MS. MUNN: We do.

MR. GRIFFON: -- we also have to -- my -- I guess my approach in this has been to sort of go where the data takes me, too. And when we -- when we see new pieces of data, you know -- you know, you -- you have to sort of follow that to some extent, you know, and -- so we don't know, you know, on every site how much is going to be enough unti-- you know, until you look at the data, you just don't know, so you don't know --

MS. MUNN: But we're not going to come up with perfect data, no matter what we do.

MR. GRIFFON: You're not going to come up with perfect data, but you know -- I mean we're lucky -- you know, we're just starting to see any raw data so, you know, that -- that's --

MS. MUNN: We have to weigh that against our responsibility not only to the claimants, but to the taxpayers and to the rest of our colleagues, as well.

MR. GRIFFON: Right, right, right.

MS. MUNN: So it's not an easy question to answer.

DR. MAURO: It took us a long time to get to this point.

MR. GRIFFON: Yes. And let me just note that it took us a long time to get to thorium at Y-12, as well.

DR. MAURO: And I -- and I -- I --

MR. GRIFFON: So I don't think this is a wasted effort.

DR. MAURO: No, I -- I'm -- I'm optimistic now --

MR. GRIFFON: Yeah.

DR. MAURO: -- that we have a path that we -- there's this thousand documents that some type of process is going to be used to cull through

that to address the different bins. So in other words -- I almost -- see, I have to say, before listening to all the conference calls I felt as if we were lost in the woods. You know, I -- I don't feel that way right now. I feel as if we've got a -- we've got a path now and we're going to -- and we're going to close this --

MR. GRIFFON: And can I help you find yourself a little more on that? I don't think -- I don't think it's a thousand documents. I'd love to see --

DR. MAURO: Well, that's --

MR. GRIFFON: I mean I believe you've obtained a thousand documents in this process.

DR. MAURO: Those are going on the O drive. Right?

DR. ULSH: Whoa, whoa, whoa --

DR. MAURO: No, no, no --

MR. FITZGERALD: There were 46 that were.

MR. GRIFFON: I think we're focused down to about 46 plus urinalysis logs, plus some other pieces, you know. You -- you've obtained a thousand documents --

DR. ULSH: A thousand documents, John --

MR. GRIFFON: -- through this whole process.
DR. ULSH: -- we have asked Scott Raines to retrieve for us. That includes individual rad files --
MR. GRIFFON: Individual rad files is --
DR. ULSH: -- which are not going to go on the O drive, right.
DR. MAURO: Oh, okay, so -- so the process is a thousand documents is something you identified by titles -- is that what it -- I'm --
DR. ULSH: Well, throughout the course of the working group meetings over the past year or whatever it's been, in response to some of these requests, we've requested from Mountain View about a thousand documents.
DR. MAURO: Okay.
DR. ULSH: We include log books --
DR. MAURO: That came in, these --
DR. ULSH: -- and rad files --
MR. MEYER: We've looked over probably 5,000 summaries and had him extract -- I would guess -- and I had him extract about a thousand from the records that --
DR. ULSH: Now not all of those are going to be on the O drive.

DR. MAURO: And out of that, based on your judgment of looking at that, there's some subset of that that you feel is going -- might be of value, might --

DR. ULSH: Forty-six.

DR. MAURO: It's important to --

MR. FITZGERALD: Forty-six.

MR. MEYER: Forty-six.

DR. MAURO: I didn't hear you.

MR. MEYER: Forty-six.

DR. MAURO: Okay. And -- and those 46 are going to be your holy grail -- in theory.

DR. ULSH: I'm going to look at them first before I commit to that.

MR. FITZGERALD: Yeah, I'd just say --

MR. GRIFFON: I've got to say, I think -- a thousand documents, I've been waiting for a while for these log books and -- you know, if I could have put on hold those 950 and -- and had the 50 up front about three meetings ago, I would have been much happier, you know, so I don't know what those thousand --

MR. MEYER: Those included responses to a lot of other queries, too, the -- the JT files, for example, are included in that thousand, among

other things that we've talked about, so it's --

MR. GRIFFON: Yeah, and a lot of them were the individual rad files for the individual cases that you pulled -- that you tracked back --

DR. WADE: Let's get back to the task. Everyone around the table can feel proud of what they've done and what they're doing, but it's more about tomorrow than it is yesterday, so we need to just go on.

DR. ULSH: Mark, there are a couple of data integrity things. The safety concerns -- I don't think I'll say anything more about that right now, let you guys have time to review it.

MR. GRIFFON: Right.

DR. ULSH: The two things that I propose to you -- and agree or don't -- that we should maybe cover is let Karin give a brief summary of the data integrity write-up that she has prepared. One of the issues that is commonly heard in terms of the data integrity issue is film blackening and --

MR. GRIFFON: So this is a -- let me just -- just step in for a second, Brant. This is a summary of the -- Karin went through and -- and

pulled out all the affidavits or individual assertions from the petition --

MS. JESSEN: Well --

MR. GRIFFON: -- and did you -- did you -- do you have those? 'Cause we've been waiting for that, or was that -- that was delivered. Right? Yeah.

MS. JESSEN: Brant put -- Brant put that on the O drive on Monday --

MR. GRIFFON: That was the 70-page document or whatever --

DR. ULSH: Yes.

MR. GRIFFON: Okay.

MS. JESSEN: Yes.

MR. GRIFFON: I got that. I haven't looked at it.

DR. ULSH: To clarify, it's the -- it's the affidavits from the petition, it's the public comments that we've heard at the Denver Advisory Board meeting primarily, and other concerns that were expressed by members of the public and the petitioner throughout the course of our working group meetings. All of the -- I hope all of those are captured in this document.

MR. GRIFFON: Okay.
MS. JESSEN: Yeah, I do, too.
DR. ULSH: So maybe we can just let Karin give a brief summary of that and then, if the Board so desires, then I'll talk a little bit about the blackened film issue. Does that sound...
MR. GRIFFON: Yeah.
DR. ULSH: Oh, wait, wait, wait, we forgot the '69 fire.
MR. GRIFFON: We want to get to the fire -- we want to get to the fire, yeah.
DR. ULSH: I'll skip the blackened film, unless you guys really want to hear it.
MR. GRIFFON: Do you have something in writing?
DR. ULSH: I have written it.
MR. FITZGERALD: We have the memo and --
MR. GRIFFON: Do you have something in memo form?
DR. ULSH: Yes, it's been e-mailed to you.
MR. GRIFFON: Why don't we --
MS. MUNN: Your memo's pretty thorough, Brant.
DR. ULSH: Okay, I'll skip that off the table.
MR. GRIFFON: Yeah, let's hear the summary --
DR. ULSH: Karin and Mel.
MR. GRIFFON: -- and cover the plutonium fire

and (unintelligible) planes to catch, yeah.

INDIVIDUAL STATEMENTS IN PETITION

MS. JESSEN: Basically -- basically Brant just covered it, and that -- and what we have right here are 41 examples that, as Brant stated, were pulled from the petition, conversations between the petitioner and Brant, public comment meeting -- I went through the notes from the public comment meeting, both on Wednesday, April 26th in the evening, plus Thursday, April 27th during the day where individuals had made statements regarding their issues. And all of the -- all of that information has been pulled together into this 70-some-odd-page document.

Basically there are issues that come out that are a little bit more reoccurring than -- than others, but the -- the two most reoccurring in -- in all the information that we've gathered so far has been the inaccurate records and the recording of zeroes. The other thing covered are blackened badges and lost crystals and the lead apron issue, and no current data available. And so we have addressed all these issues in this document via the individual. In

other words, we've gone back to their personal rad files and --

DR. ULSH: Where appropriate.

MS. JESSEN: -- where appropriate and pulled that information and followed that back to try and answer those concerns, and that's all in this document here.

MR. GRIFFON: I think -- Karin, I missed one of yours I think -- inaccurate records, recording zeroes, blackened badges, lead aprons -- I missed --

MS. JESSEN: Lost crystals.

MR. GRIFFON: Lost crystals, okay.

MS. JESSEN: And no current data available.

MR. GRIFFON: Right.

MS. JESSEN: And as far as the evaluation report, some of these issues were covered in the evaluation report, some of them were covered generally. In the evaluation report I didn't cov-- I have statements from the affidavits pulled out in the evaluation report and have addressed those, without the identifiers, but those issues have been discussed in the evaluation report and in -- in this document here. And in answer to the

question, have we made more progress since the evaluation report and what was discussed in the evaluation report and in the data integrity issues that we have, there have been -- there has been some good information that we have discovered. I mean it hasn't been a lost cause, it's been very informative.

DR. WADE: Thank you. Does -- do -- do you feel it necessary to modify the evaluation report, based upon what you've done at this point?

DR. ULSH: I think I should probably answer that one.

MS. JESSEN: Feel free.

DR. ULSH: No.

DR. WADE: Okay, that's fine. Thank you.

MR. ELLIOTT: Would this document serve as a supplement to the evaluation report to explain, when we have to find ourselves communicating to individuals who submitted an affidavit, what happened with their -- with their concern?

DR. ULSH: If you desire, Larry, or if the Board desires, we would certainly be willing to do that. I mean it's -- it does address the individual affidavits in the petition, plus a

lot more, so --

DR. WADE: Something for NIOSH to consider.

MS. JESSEN: And I would like to say --

MR. GRIFFON: I'd like to read it first.

MS. JESSEN: -- that -- yeah, the issues that were covered in the evaluation report -- I have no problems with what NIOSH wrote in the evaluation report. I mean I think those issues have been addressed and I think they've been addressed adequately, without doing these 41 examples. However, the 41 examples have provided some additional insight -- for me, for one -- to, you know, to better understand what the issues were, but -- but I do believe that the evaluation report did cover these adequately.

MR. ELLIOTT: I of course haven't read this yet, but I would like to read it in that -- in that frame of mind, is this something that can be shown as a supplement to the evaluation report that can then aid in our communication to these folks.

DR. ULSH: It goes into the issues in more detail than we covered in the evaluation.

MR. GRIFFON: You mentioned a couple of times,

you know, you learned something from doing this or you got some insights -- for examp-- can you give an example of -- comes to mind?

MS. JESSEN: A specific example?

MR. GRIFFON: Just -- we can -- we can read the (unintelligible).

MR. ELLIOTT: Like zeroes.

MS. JESSEN: Zeroes is a good one, blackened badges is another one. Inaccurate records I would say is probably a good insight that -- that I learned --

DR. ULSH: What the concerns were.

MS. JESSEN: -- what the concerns were --

MR. GRIFFON: Right, okay, okay.

MS. JESSEN: -- yeah. And -- and doing some research on -- on those particular issues.

DR. WADE: Now just -- I mean as the Secretary's representative, it's entirely possible that such a supplement would be of benefit to the Secretary to make the record complete. That's a judgment that NIOSH needs to make. The Board and the working group can offer an opinion on it.

MS. JESSEN: One of the things that I would like to add, in the original petition that came

in there were seven bases for the petition, which was discussed in the evaluation report. And then the affidavits, if you will, were little fingers of those seven bases, and so I believe the seven bases were covered in the evaluation report, as well as the general issues that were brought up. And -- and I believe everything was answered in the evaluation report based on both parts of the petition that came in, which is well over 700 pages.

DR. WADE: Good, thank you.

MR. GRIFFON: Right.

DR. WADE: Move on.

MR. ELLIOTT: Can we -- before we go on to the next one, can we just take one step back in -- in a moment of time here when I said this evaluation report came to us late. I don't know what you were thinking about --

MS. JESSEN: Yeah, I wanted to --

MR. ELLIOTT: -- but the evaluation report (sic) was qualified in June of 2000 or whatever that date --

MS. JESSEN: 2005.

MR. ELLIOTT: -- 2005. If you mark 180 days

from that, it would have been due in December -- or January sometime, and we provided the report in --

MS. JESSEN: It was April, and when I said that, I was thinking of my time to NIOSH.

DR. ULSH: Right, I would start yelling at you (unintelligible).

MR. ELLIOTT: So -- so we -- just so we cleared --

MR. GRIFFON: Thank you for correcting the record.

MR. ELLIOTT: -- correct the record, because not only do I not want to be wrong when I'm right, I want the petitioners who have made it very clear to me that this report took too much -- too long in its coming, so...

DR. WADE: And our friends in the Colorado delegation have made that very clear.

MR. GRIFFON: Thank you for clarifying that.

MS. JESSEN: That's okay, but let's talk afterwards 'cause I want to ask you something about (unintelligible).

MR. ELLIOTT: Sure.

MS. JESSEN: Clarify that issue.

'69 DOSIMETRY GAPS

MR. GRIFFON: And -- and purposefully I've saved Mel for last 'cause I knew he'd have --
DR. WADE: The crowd would --
MR. GRIFFON: -- great insight on the plutonium fire and --
DR. WADE: -- stay to hear Mel. I wouldn't (unintelligible).
MR. GRIFFON: -- he's a very good presenter so --
MR. CHEW: Well, thank you --
MR. GRIFFON: -- (unintelligible) --
MR. CHEW: -- very much, Mark, for the introduction. I just want to clarify -- go back to the exotic -- one before (unintelligible) -- we do know your report. I'm glad we had that discussion today because what I had in a report in draft form would not have answered some of the questions that Arjun brought up about how it links to dose reconstruction, so it will give us a little bit of time to improve the document to answer those specific questions to minimize your going back and forth (unintelligible). Okay?
MR. GRIFFON: Fine.
MR. CHEW: With that I'm going to -- I was

thinking about how to make this presentation. I was asked just last week -- I think it was on Wednesday when Brant sent me a kind of a cryptic message on e-mail says "should you choose this mission," it was almost a little bit of like Mission Impossible, and he said the message would self-destruct, could you track down a little bit about the Rocky Flats fire and try to glean some information, if there's any, that could possibly even answer some of the issues about the -- the data gap. This was some of the discussion about, you know, some badges were lost because they got contaminated and the (unintelligible) was in there. And so this led us -- I'm thinking about how to make this presentation. I'm going to try to keep it down to a reasonable time because we're all getting late and tired.

I'm going to pass something out first. I think it's -- picture shows a thousand words. If you can read the report on the Rocky Flats fire, I don't think you fully realize what it looks like and what the impact until you see pictures. I have two sets of color photographs in here.

First it starts off with the (unintelligible) -- I'm going to pass it down to you, Lew and Ray, if you folks would share that, and I'm going to pass this one to -- this one to you folks. I'm going to come back (unintelligible) and you can just flip through the pictures here because it will say.

The first one talks about the benelex, some description of benelex. Then there's a color photograph -- just flip through it so you can get an idea when I talk about the -- the report, you will get a feel for what we're looking at, especially the last couple of pictures which shows the actual glovebox in question that actually blew -- the initiating event of the fire. Okay? Just (unintelligible) that. I just want to give you a moment.

Then I think you heard about -- I mentioned the benelex. I've been carrying this around for quite a few years, at least probably 30 or 40 years. I've had a piece of benelex in my office. I just want to show you -- this did not come from the fire -- and so I will pass a piece of benelex so you can feel -- feel a

little bit what it looks like and this is probably one of the mechanisms that really was part of the cause of the fire.

Wanda, I apologize. I was going to -- hoping that you'd be there 'cause you always know I bring something to show and tell.

MS. MUNN: Well, yes, and I am so sorry that you don't have this in electronic form.

MR. CHEW: Thank you, Wanda. All right, as we pass around these pictures and it gives you a feeling for what we're talking about, let me just talk about the fire itself and I will start -- this happened 37 years ago -- 37, 1969. You know, the only thing about -- we talk about how we've been spanning Rocky Flats for about the last 50 years, but this happened 37 years ago. All right? And at that time it was still the Atomic Energy Commission. And the -- the fire has -- I want to clearly -- Brant gave me some clear direction. He says Mel, don't downplay the fire -- like it was a little small fire and everybody went back to work the next day, but also making sure that you give it proper perspective as far as the fire is concerned.

The fire, I would like to say, had a major -- it was a significant fire in the history of the U.S. government. I'm taking that privilege to say that. I was told that several times, because its total impact to not only Rocky Flats, its workers, the production, but to the Atomic Energy Commission, the national laboratories and the Defense Department was great. Okay? It was great. There was no question about it. Right? It was the height of the Cold War, remember -- us -- many of us don't even remember what that is anymore. Okay? It was the height of the Cold War. And many, many production units were in full production at Rocky Flats. There was significant increase of the quantities of plutonium that had to be required to be processed and -- and to supply the weapons -- to supply the weapons complex.

To that note, Hanford and Savannah River was trying to continually to produce as many and much plutonium supplied to Rocky Flats to -- to make the necessary weapons components. But that didn't even do the job as part of the requi-- meeting the demand.

The other side of it that -- there was a lot of machining operations and chip operations that went on that many -- much of the plutonium could be recovered. I'm just giving you a little bit of background of what was some of the leading reasons for what (unintelligible). Arjun, I think you're going to enjoy my first statement here. Let me put my reading glasses on. Because of the -- of certain -- well, additional quantities of -- of the plutonium needed -- right? -- in the system here, they had to basically process and try to make some new material, using a foundry process, to -- to supply materials into -- into the -- into making plutonium -- to reprocess plutonium for the machining operations and chip and -- and because of that -- because of that, additional neutron shielding had to be needed. Okay? And this is why you see a piece of benelex being passed around.

Well, the -- the concern for the -- concerns for the increased levels of penetrating radiation, like neutrons, for employees led to significant amount of increased shielding, not only in front of the gloveboxes to reduce the

exposures -- this talks about installing lead -- lead glass, lead glass, benelex and -- and -- and plexiglass in various thicknesses on the gloveboxes and in the conveyors. But that didn't still do the job because that's -- tried to be too -- an exterior. And when you add exterior shielding to the outside of the glovebox, it makes it very difficult for the workers to work. They can't reach in there. So at the time, as you saw -- there's some pictures of -- here and I want to -- want to share -- share -- show a picture of the -- of the cans inside the benelex shield. (Unintelligible) so we can focus on what's happening here.

They -- there was briquets that were made, briquets they made from the machining operation. What those briquets and chips were -- and you can see them -- was that as the machining operations were taking place, the chips are now brought into a -- a press and pressed into a briquet. Well, the machining takes a -- requirement -- uses oil for -- as (unintelligible) machine, and there's a considerable amount of oil. Oil -- then the

chips are dropped into carbon tetrachloride and to -- to try to remove as much of the oil as possible, and then dried, and then -- and then mal-- the material was pressed, as best as they can. But there's still enough residual oil. Okay? I'm leading to the mechanism of what started the fire so we can all understand that. These oil that -- during the pressing operation the oil drips from the press and then there were rags that was used to wipe up the chips. There was two theories of how this -- the fire started. It was because they have the oily rags and the chips containing plutonium -- that is a slightly exothermic -- that potentially started the fire and start that initial fire, that's the initial mechanism -- mechanism that started the fire.

There's another theory, probably less theory. There's some annealing furnaces nearby and the oil rags was still by, there was just enough heat to basically start that fire going.

But be it so, the actual mechanism is probably focusing on the combination of the plutonium and chips along with the oily rags. In turn it set some of the briquets on fire -- okay? -- on

fire, some of the plutonium briquets, as you can see some of the pictures here. And in turn it started the plexiglass -- the plexiglass and the gloves -- those gloves that was inside a glovebox. They were probably the most vulnerable (unintelligible) start on fire. The fire -- the smoke from the fire was primarily from the plexiglass.

The benelex, as you see -- there was a large cabinet built into the -- into that particular glovebox that you will see -- in the pictures you will see, and I'd like to bring back and so I can hold the picture up and you can see it -- thank you. Now you see, these are -- these are the benelex cabinets in here. This is in the well-known glovebox 134.24, and I showed you a couple of pictures here of what the -- of this -- of what the -- in part of the line, the box -- Wanda, I'm sorry you can't see some of these pictures here, but it shows how -- where the north wall was and which box -- this is box 134.24 in this particular area. And I gave you folks a little bit of an artist's perception of -- artist's conception of what the box line looked like. Okay? You can see -- you can see

that -- that's why I showed it around first, you can see the box line. This is the box line that had the benelex box in it.

This box was about 14 feet long -- okay? -- and it was about two and a half inches high and about 12 inches thick. Because they could not shield it from the outside, they decided to make -- modify the box to put the benelex cabinets inside the box. Right? So now you can see the scenario. We have some large -- we have large gloveboxes here with a large cabinet -- basically a cabinet, a drawer, full of these benelex -- layers of benelex for additional -- for neutron shielding, and the cans that held these briquets and chips while it's either waiting to be pressed or waiting to be -- after it was pressed -- to go back into the foundry and to -- to be -- to be made into ingots for plutonium. So you can see the scenario going there. Okay?

Well, I think we all know that this particular fire -- and now I will now talk specifically about the fire (unintelligible). Okay, thank you very much for your patience here. I mentioned about the briqueting operation. I'll

just now go directly to the fire.
It happened on Mother's Day, May 11th, 1969, about 2:30 in the afternoon. Many of the shifts that -- that the -- the majority of the work was not -- there was no work being done in 776. There was a little bit of packaging work that was being done in 77, even on Sunday. There was quite a bit of work being done on Saturday to actually help produce some of these particular chips and make these briquets to go into these storage cabinets.
At about 2:30 in the -- even early in the afternoon the people who were the roaming guards and there are people who are the -- what they called the operators who maint -- maintenance operator of the -- the building itself. These are not like the process operators. These are people worrying about -- to make sure the ventilation is working and things like this was making their normal rounds and did not see anything unusual.
The first alarm came in at about 2:27 in the afternoon. Right? And the first alarm was basically a heat detector from underneath box 134.24. Interesting sight -- in hindsight and

going back into some of the -- some of the issues here, these heat detectors in the past was put on top of the cans where the chips were. But because they had to put the benelex cabin inside, the cans were put inside the cabinetry, the heat detectors were placed underneath the box -- underneath the benelex, so there was a significant amount of shielding from the heat detector -- from the -- from the chips itself. So that's probably -- in fact it probably smoldered for a while before the heat detector even start to sense it for any initiate -- enunciation.

Well -- put my reading glasses on, this is (unintelligible). Thank you.

At about -- the -- the alarm came in to the fire department and -- and they immediately responded. There were several alarms. It turns out that there is a -- there was two alarms that came in from the same enunciator just becau-- the times were slightly different, but that was resolved because the clocks on the dispatcher and the enunciate panels were slightly off sync, but they were the same alarm.

Then at about 2:33 another alarm came in, and that was the operator who was upstairs on the second floor, had smelled some smoke and he decided to initiate the alarm.

By that time the fire captain on duty, along with three fireman -- four people -- responded to the fire in building 776 right about 2:29 -- okay? -- about two minutes after -- after the -- the alarm came in. They saw smoke coming out of the -- of the -- of the corridor in the box line here, and one of the firemen or the captain said that out of the top of the glovebox line there was about 18 inches of (unintelligible) flames.

Now I know I'm talking about this -- this is doc-- I'm pulling everything -- this is going to save me from writing you a report, Mark, I'm going to make this little humor here, because everything I'm taking from -- is on a -- is on the full report that you folks now have, which is the redacted version. Okay? You actually see that. And I'll tell you the little difference between the classified version and the unclassified version of the -- of the fire, because we did look at the classified version.

Okay. The fire captain directed the people to fight the fire with the CO2 extinguisher, man-- manual one, and even the 50-pound extinguisher really, but to not much avail here. Shortly after, you know, the -- the captain -- at about 2:34, as been in a document, which was only about less than seven, eight minutes after he -- they re-- responded or saw the alarm, they decided to attack the fire with water. And now this is significant because it was his decision, even though they were told very clearly because of -- you can all understand, because of criticality issues, you know, fire was not to be used and that's probably one of the issues of why sprink-- that facility was not sprinklered. You know, from now on, they all are, but at that particular time that was not the criteria, and so they decided to fight the fire with -- with water, a very, very important decision based on the captain and his heroism and decision was clearly commended by the Atomic Energy Commission -- I'm getting feedback here.

Okay? The -- now the -- the -- when he took the initial -- they actually tried to even

fight some -- the fire with magnesium fluoride, and there's some stories and anecdotal stories, but documented also in the report, the firemen actually started to put some water directly even on the plutonium. The plutonium sparks when it did that, and surprisingly enough, this is something that they found afterwards, the fire actually helped the amount of plutonium being dispersed easily because it actually helped crust the plutonium.

UNIDENTIFIED: You mean the water.

UNIDENTIFIED: You mean the water.

MR. CHEW: What the water did, yeah, contrary to what they even have thought, and -- and that was a surprise and I directly had that message at -- remember the last time we mentioned Dr. Roland Felt and we had called Roland? He was one of the consultant that was part of the investigating board, and he made sure that he mentioned that. That was his finding as being a metallurgist that -- how interestingly the thought to now put water on -- on plutonium was completely contrary to what they ever thought, and that probably helped a lot.

So I'm going to try to run by the story very

quickly (unintelligible). The firemen did go up to the roof. The -- I'm going to draw to one picture, I thought it was important and I'm going to pull this out of the -- the (unintelligible) report here because it has a nice picture of the -- of the (unintelligible). Give me a second, sir, to pull the report out.

(Pause)

I'm just going to show a picture here because you will see a -- a picture that shows the -- where in -- in -- in diagram form of -- the fire started this particular point, worked down this particular box line, came down this way and went this -- down this particular machining line. This particular fan that was pulling on the exhausts of these particular gloveboxes plugged almost immediately and -- and so the fire that was being pulled -- that's why it came down -- this line was pulled by this particular exhaust fan. The significant of this is that the roof stayed very much intact. The building structure never was compromised in the fire here. And matter of fact, thank to the alertness of the fire department to go up and actually spray to keep the roof cool

probably helped that situation entirely. But also the smoke was coming out of the -- of the filters of the -- the ventilation system that is pulling the air out of this particular line here.

This goes through about between four to six -- four to six stages of HEPA filter before it's released. All right? This is the glovebox line here. The room filters only go through one -- if one or about two stages of filter, but the -- the glovebox line is the one that they saw some of the smoke from, and the majority of the releases of plutonium to the environment did come from this particular box line.

Well, I think I've talked a little bit about the fire here. Let's talk about some of the -- the initial response and the -- what I consider the -- the health physics implications here. Okay? We'll go directly to that.

A total of 33 firemen and security guards were utilizes different times and -- of the fire during that particular day. There was some fortuitous here. It was right about during a shift change that happened, so there was a

maximum amount of fire department was able to -- was -- happened to be on-site at that particular time, something maybe fortuitous we looking back. No outside fire department units were -- came to -- to have to help assist in fighting the fire. In -- in all, about 41 people was involved within the first 20 -- one -- 24 hours that -- that help responded to -- to the initiating of -- for help in fighting the fire, and -- and out of that 41, the people and -- and I'm going to add onto that, there was an additional -- about 70 additional people, a total about 110 people, that was counted for lung counting for -- for possible intake or possible inhalation due to the -- responding to the fire. But the 41 people were counted within the 24-hour period. And these were lung counts. All right? I'll just mention about --

MR. GRIFFON: Who -- who were the ten people, 'cause I'm reading the 41. You said ten is a subset?

MR. CHEW: There was a -- there was a -- 41, you're --

MR. GRIFFON: Yeah.

MR. CHEW: -- well, there was 33 firemen. There were 41 that was counted within the first 24 hours, but a total of about 110 were counted --

MR. GRIFFON: Oh, 110.

MR. CHEW: 110, I'm sorry, I added some --

MR. GRIFFON: I'm reading (unintelligible) --

MR. CHEW: Oh, you're reading the same report, that's good.

MR. GRIFFON: Yeah.

MR. CHEW: That's good. As you can see the pictures that I showed you, the -- most of the plutonium -- and it was a large quantity of plutonium. The val-- the difference, Mark, between the unclassified report and the classified report is the total quantities of plutonium that were either in any one location or totally involved with the fire, or was totally involved in the buildings themselves. Right? And the only other -- other thing that is -- was redacted that we have seen that's in the classified report, there's a little bit of -- talking about the different shapes or the different phases of the plutonium, and that's about the only difference that you see. So

pretty much what you see here is -- is a pretty complete report. Okay? I want to make sure that you -- you know that.

The -- the fire -- the fire was basically put out about -- they -- they av-- they said in the report, pretty much by about 5:00, 6:00 o'clock, late in the afternoon, and pretty much what they would consider under cont-- in control at about 8:00 o'clock time period.

The RAC* report has -- had -- went back and several people have -- went back and re-analyzed exactly how much plutonium and how much material might have escaped from the -- from the roof and from the ventilation system.

A nominal value has been chosen to be around 20 millicuries. And weapons grade plutonium at that particular time, that would represent something in the order about 200 milligrams of plutonium escaped (unintelligible).

Now this is probably where -- the part that Brant wanted me to talk about here is what after the -- the report that you will be seeing really focusing in -- really focuses on what caused the fire and probably just a few -- a few days apart of initiation of the -- of the

event itself, the fire itself. Now I have been interviewing several of the people who helped to -- helped decontaminate due to the fire. I have not personally talked to any people who were the initial first responders. I did talk to Dr. Roland Felt himself, and Mr. Ken Caukins*, and I would like to just share what they had to say about what the significant to -- what -- for this particular discussion here. The -- the building -- the investigating team stayed on-site until about the June time frame, late June time frame. They were doing the investigation, so no work was being done inside 776. But you can picture now -- why I -- why I showed you the pictures earlier -- we have quite a bit of burned plutonium and plutonium in oxide form laying on -- on -- inside the conveyers and --

MS. MUNN: Mel?

MR. CHEW: Yes, ma'am.

MS. MUNN: I understand you have triangulation problems, but I -- my ear is just about to fall off I've been pressing my phone against it so hard trying to hear you.

MR. CHEW: Oh, thank you, Wanda.

MS. MUNN: Is there any way you can -- I don't know what -- part of it may be your whole system --

MR. GRIFFON: We -- we just moved you, Wanda.

MR. CHEW: Wanda, can you hear me? Is that a little bit better?

MS. MUNN: That's much better.

MR. GRIFFON: You're sitting next to Mel now.

MS. MUNN: Thank you.

MR. CHEW: I was -- I was trying to look at Arjun when I was talking because I know he would take great interest in what we're trying to discuss here.

MS. MUNN: Thank you.

MR. CHEW: I apologize for that, though, Wanda. Let me pick it up here. I'm going to talk about what happened -- well, shortly thereafter to the building itself, and this is what is not in the report, Mark, and basically on interviews and discussion of some of the chronology of some of the events that may be important to -- to some of the things that -- issue are -- the discussion.

Many people in the whole plant helped -- responded to help -- help with the fire. They

didn't have to help fight the fire, but help decontaminate as a result of the fire, so you will talk to a lot of people says yes, we helped the decon of the -- of the -- of the Rocky Flats fire. That's true. They pulled people from everywhere.

Then what they did was, because there was significant amount of contamination to the adjacent buildings, like the other parts of 777 that wasn't affected by the fire, but it was contaminated because the smoke -- 70-- 771 included. There's some adjacent quarters that attach to each other, some tunnels. The water that was used to fight the fire probably is the one that spread the majority of the contamination, that once the water was dried or picked up, you know, it had to be decontaminated, so there was a lot of people. And everyone I talked to said yes, they were suited up. They only had to work for limited time 'cause it was hot. The ventilation was not on. But they were clearly monitored, as you -- as I was -- and that was a clear question I will make sure that I asked them, that they were monitored as they went back in

to help decontaminate.
But I want to make a point that not until the investigating team released the building 776 where the fire that you see started and where the majority of the plutonium was did -- did anyone go back in to do anything in that particular building. Okay? But now, as you can see, Arjun, the -- many of the shielding is gone because the benelex, you know, has been burned and -- and the plexiglass is burned. The benelex pretty much stayed, as you can see, even fairly intact, still providing some neutron shield, but now the -- the cover, including the windows, including the plexiglass windows and the plexiglass windows that is sitting in front of the containers are also been burnt out. Okay? So it does offers a source, there's no question of that.
So after the -- the investigating group released the building so the recovery of the material took place. There was significant amount of material that needed to be recovered, to be retrieved, actually. Now there has been several reports that you will see, and in the order of about 1,000 KGs was potentially in

that particular area, and in the later reports that only about 300 to 400 kilograms of it really needed to be reprocessed. Must -- much of it actually -- the chips and -- and -- and the metal stayed fairly good, and so they were able to put that right back into the foundries. So that just gives you a -- some -- a feeling of magnitude.

A key point was that -- I talked to the gentleman that was responsible for leading the attempt to go back in to recover the material. I'm going to spend a little bit of time there. The recovery of the material was taken with a tremendous amount of caution, mainly because there was great concern for criticality, and because the conditions of the water and -- and only salaried people was asked to -- volunteered to go back in to help recover the material. I think that's a -- that's a -- was a key point that I wanted to bring up under that discussion here -- the discussion with Mr. Caukins here, Mark, that the salaried people were asked to do that, and they were the professionals -- mainly because there was -- they were coming into conditions that they were

unknown, and so therefore they had to make on-the-spot decisions and that's why they were working directly with the criticality people. And what the process -- what -- they literally went in with a little brush and -- and a dust pan and -- and basically picked up the oxide and put it into cans -- these are the cans that you see pictures of -- and then passed -- and bagged that out and then pass it on to some counters that counted the material right away and -- and so they can keep track of -- from an accountability what they pulled out of the -- of the -- of the fire and then they went into building 771 to -- to be recovered. Right? This process took quite a bit of time in -- in the September/October time frame that was used quite a few of the professional staff to actually remove all the material out of -- that was involved with the fire. The dec-- the decontamination was still going on --

MR. GRIFFON: When you're talking about professional staff, are -- how many -- how extensive was this -- was this --

MR. CHEW: The number of people?

MR. GRIFFON: -- tens of people or was it --

MR. CHEW: You know, I didn't --
MR. GRIFFON: -- 25?
MR. CHEW: -- ask Ken --
MR. GRIFFON: I'm just curious.
MR. CHEW: -- that question and I forgot, I apologize, I didn't ask him --
MR. GRIFFON: That's okay.
MR. CHEW: -- how many people were involved, but that's a very good question, but it was the professional staff, Mark, and I think that's a -- that's worthy of note here. Okay. Again. Okay?
Well, as you know, the -- the decontamination, even of the surrounding building to get it back into -- into operation even took quite a while. Decontamination even had lasted for several years. But much of the operation after the shops were processed and recovered and to make useable was back into operation shortly after, within the six to seven-month time frame.
I'm going to stop at this particular point to see if there's any questions and see if I have basically discussed the fire and -- and Kathy, I'd just like to say, yes, there was a fire, and thank you for that particular comment in

the log book. The -- Bryce Rich and myself went to the Denver (unintelligible) Center. We reviewed four boxes of classified documents, of which the redacted versions you have. We also reviewed all 90 of the personnel interviews that was part of the investigation. And out of the 90, many of those were the first responders and -- and also people who -- who have knowledge of what was going -- what was going on that would potentially contribute to the initiation of the fire here. Okay?

UNIDENTIFIED: Thank you.

MR. CHEW: Any questions? I'm going to stop at the particular point, Mark, (unintelligible).

MR. GRIFFON: Yeah, I -- I think I'm -- I'm just gleaning through volume one of five or whatever it is.

MR. CHEW: Right, I was going to mention that --

MR. GRIFFON: It's interesting that there's -- I see this last section, fire experience, from '66 to May of '69, you know, that have been a total of 164 fires, 31 involved plutonium. I didn't -- I didn't realize there were that many.

MR. CHEW: Well, smaller --
MR. GRIFFON: Smaller magnitude, I'm sure.
MR. CHEW: Plutonium fire chips was quite common.
MR. GRIFFON: Right.
MR. CHEW: Matter of fact, everything --
MR. GRIFFON: Not unlike uranium -- right.
MR. CHEW: Right, plutonium chips -- you know, even though we know about the pyrophorescity* -- and that's quite a word here, but pyrophorescity of the material, of plutonium, I'd like to make a good comment -- that's a very good comment -- and they went back -- when they actually recovered the plutonium, they actually found them in nice little piles. All right? Now plutonium burns -- I think all of us recognize -- like -- pretty much like a charcoal briquet, and it smolders, and it just burns down like a charcoal briquet. And that makes it easier to recover. And on top of that, when they put the water on it, it actually even formed a little crust, so going back to recover it was actually not a very difficult process -- difficult from the logistics standpoint, but the actually recovery

of material and put them in can was not difficult.

I just only mention two or three -- four more things for the record here. Volume two contains some of the pictures and the maps and the ben-- and the discussion about the benelex which I brought for you, and this is the -- why. I thought the pictures in color was a little bit better. When you look at the redacted version, you can see that -- the picture, but you cannot make it out like I brought the pictures, and that's why I asked -- I was -- I chose to make a decision to bring the pictures to show you that directly here.

Volume three is the con-- some of the conclusions that led to the fire, but everything is pretty much spelled out in volume one. It's just a very summary of the conclusions that led to the fire.

Number -- volume four is the organizational aspects, what are some of the organizational responsibility, some of the decisions made by the organization responsibility that might have contributed to some of the issues that was brought forth in the fire.

And the last one is a discussion of some of the management issues, and that's volume five of the report. But the majority of the int-- things that we're interested in as far as potential for -- add to the people involved and the dose reconstruction really is contained in volume number one.

MR. GRIFFON: Did they -- did they say anything about -- for the responders, was there any special dosimetry, was -- were they using --

MR. CHEW: The initial responder --

MR. GRIFFON: -- their regular badges or --

MR. CHEW: -- had what they had on.

MR. GRIFFON: -- yeah.

MR. CHEW: They had what they had on, and all those people, you know, were obviously externally monitored and they carry -- the -- when the -- when the people went back for recovery -- very good question -- then obviously the additional concern -- I talked to Mr. Caukins directly and says oh, yes, we're obviously very concerned about criticality, and so there were additional things that even they monitored just in case there was a criticality. I don't know if there was any double-badging

involved, but they -- they -- he mentioned -- volunteered they were very carefully monitored because of -- of the potentially safety issues regarding to a criticality (unintelligible) --

DR. ULSH: I think we actually talked to Wayne Jesser*, the fire captain at the time, the guy that also made the decision to use water, and he said that they were double-- didn't he say they were double-monitored?

MR. MEYER: Yeah, he specifically said they were double-badged. They had one inside the protective gear, basically this SCUBA -- self-contained breathing apparatus they were using, and one mounted externally, and he recalled that clearly. He was -- he escorted all of the investigators during the early period.

MR. CHEW: When he did the original response, was -- were they -- do you know if they were double-monitored? I know what you're saying is that when they brought in the investigating people, they did that. What is that -- is that a normal thing that they were during daily --

MR. MEYER: I didn't ask him that.

MR. CHEW: Ah, okay.

MR. MEYER: I assumed this because they did it

during the entire investigation, but I didn't ask him that.

MR. CHEW: Sure, sure.

MR. GRIFFON: Are you -- a bunch of people I think are --

MR. CHEW: Right --

MR. GRIFFON: -- fighting the clock with planes --

DR. MAKHIJANI: I have a --

MR. GRIFFON: -- yeah, yeah.

DR. MAKHIJANI: -- quick question.

MR. GRIFFON: Go ahead, quick question.

DR. MAKHIJANI: How complete are the monitoring records of the people who were -- went for recovery operations?

MR. CHEW: Good question. I knew you were going to ask that, Arjun. The 110 -- the (unintelligible) -- the 110 people that were lung-counted -- okay? -- I didn't get into the detail -- there was probably -- as you will -- probably will see the report, there was one person, one fireman, that they feel that had what they consider significant lung counts. Right? And his lung count showed, Arjun, he had about 1.4 times the maximum permissible

lung burden at that particular time.

DR. MAKHIJANI: Yeah.

MR. CHEW: His initial counts showed it much higher, but it looks like he inhaled the material rather than -- I mean --

DR. MAKHIJANI: Ingested it.

MR. CHEW: -- ingested it rather than inhaled it, I should say correctly, 'cause it showed up very highly in his fecal sample. And so that was the only one that they showed that was above the permissible lung burden by lung counting. And I want to clar-- clar-- that the minim-- the detectable -- minimum detection at that particular time was about a half a lung burden. Okay?

MR. MEYER: Jesser, the fire -- the fire --

MR. GRIFFON: 7.5 rem, whatever. Do they -- do they -- do they credit this to -- I'm wondering why '65 had so many heavier lung burdens than the '69 fire, the '65 fire that they're using for our super S model, is this -- it just dawned on me why -- why not some of these cases for the super S model, but it seems that they had higher ingestion and less lung burdens and --

MR. CHEW: Well, I think because I think there were --

MR. GRIFFON: (Unintelligible) it a super S (unintelligible).

MR. CHEW: -- there were people there --

DR. ULSH: Yeah, exactly.

MR. CHEW: -- and there was nothing -- nobody there when the fire occurred in 776.

MR. GRIFFON: Okay.

MR. CHEW: And by the time they responded, it was --

MR. GRIFFON: (Unintelligible) proximity (unintelligible) proximity to that.

MR. CHEW: Yeah, well, they were -- they were there and present when the fire -- when the -- happened with the earlier one.

MR. GRIFFON: When it happened with the glovebox in '65, right?

MR. CHEW: Right.

MR. GRIFFON: Yeah, yeah, yeah.

MR. CHEW: In the '69 fire they responded with gear on.

MR. GRIFFON: Right. So there was nobody in the area --

MR. CHEW: Exactly right.

MR. GRIFFON: -- evacuated and getting exposed.

MR. CHEW: There was nobody there.

(Pause for telephone interference to be resolved.)

MR. MEYER: He did -- Jesser, the fire captain, did specifically say that the exposure occurred, best of his recollection, when they were removing their protective gear afterwards. There -- there was --

MR. CHEW: Exactly right.

MR. MEYER: -- contamination that moved and -- and that -- lost control of it once or twice.

DR. MAKHIJANI: We do have these records. They're not part of the destroyed '69 records or --

MR. GRIFFON: Well, this is the question -- I -- you had the same question I had, was did you crosswalk these -- do we have these 110 names and does -- does this in any way explain this data gap. I -- you know.

DR. ULSH: I know that we're trying to wrap it up --

MR. GRIFFON: Yeah, I know --

DR. WADE: But this is important. We should spend time on important things.

DR. ULSH: Okay. The 110 people -- the

accounts that we've heard was that they were all monitored, externally monitored. Correct? Am I correct?

MR. CHEW: Uh-huh.

DR. ULSH: Okay. In terms of -- I mean we -- Mel just found this out like a couple of days ago so we haven't gone and pulled the rad files to see if they were monitored.

MR. GRIFFON: Right, right, right.

DR. ULSH: Now the other piece of this puzzle is that -- that progress report that I mentioned to you, Mark, the dosim-- monthly dosimetry progress report, where it was stated that people who were stationed in non-plutonium areas and on quarterly badge exchange cycles -- and those people are the ones that were thought to be, you know, at low risk -- they would continue to wear film badges, but those film badges would not be read unless circumstances warranted.

Now this decision was made before the fire. It was like in April, I think, of '69. All right? So you've got people working over in the uranium buildings and the administrative buildings that -- their badges were not read.

Now the fire happens, and they call people in from all over the site to respond, but that is only after the plutonium had been secured by the -- what did you call them, Mel, the materials recovery group?

MR. CHEW: Well, come of the people came in earlier to decontaminate, you know, peripheral areas of the buildings, not in-- not involved with 776.

DR. ULSH: Right.

MR. CHEW: Yeah, so that did happen at the same (unintelligible) -- sorry, go ahead (unintelligible).

DR. ULSH: So we're thinking that the data gap is largely explained by that decision to -- that those other people -- not to read their film badges. Those are essentially unmonitored people in 1969.

MR. CHEW: Yeah, I -- say it again -- well, I -- I'm just going to add onto what you say. Clearly there could have been people who was part of that quarterly exchange and not have to be read that was asked to come in and help decontaminate, because they were only looking for small traces of alpha contamination, like

either on a walkway or something like that.
MR. GRIFFON: But in those other areas, it would have been the professionals, the --
MR. CHEW: Right. Yeah, and -- and -- and there would -- probably there was no expo-- external exposure, and so I don't think they would have said okay, well, now we've got to put on badges because he's going to be -- have an increased external exposure. They could have been the same people and have been -- still stayed on the same quarterly exchange.
MR. GRIFFON: (Unintelligible) same badges, okay.
MR. CHEW: Sure.
MR. GRIFFON: Yeah, yeah, okay. That seems reasonable, but I -- I don't know that it gets -- I think we need time to digest this issue.
DR. MAKHIJANI: Yeah, and you have to obviously have time to go back and see if these records are there and they're not part of the missing records.
MR. MEYER: Something that may be important, Scott Raines had indicated last week that they will be relocating their records offices -- he said last week -- in a month or two, date not

specific. They have to --
MR. GRIFFON: (Unintelligible)
MR. MEYER: -- send most of their stored records -- they have 100 boxes of our records there right now. They have to send most of those back, he hasn't quite said how many, and there certainly will be a hiccup here in retrieval during that period.
DR. ULSH: Let's get our log books before they (unintelligible).
MR. GRIFFON: All the more reason to get what we need quickly -- yeah.
MR. CHEW: Mark, I would have no problem if we have some additional dialogue if necessary because --
MR. GRIFFON: Yeah, yeah.
MR. CHEW: -- (unintelligible) chance to ask some questions to people, what their roles were -- specifically. I mean they say I helped decon the fire. Well, where would you decon fire, were you inside that particular building where the material was? No, I --
MR. GRIFFON: I think that's (unintelligible) --
MR. CHEW: -- wasn't I was outside, some things

like this.

MR. GRIFFON: -- becomes important because of that '69 data gap question.

DR. ULSH: Uh-huh.

MR. GRIFFON: We've got hypothesis, but it seems like we have different hypotheses each time we count, so --

DR. ULSH: Well, actually this one's holding up.

MR. GRIFFON: Yeah, well --

DR. ULSH: This one's holding up though.

MR. GRIFFON: At least through this workgroup meeting. Let -- let -- I mean I think this might be worth-- but we have -- rich -- rich dataset here, too, that we don't have to, you know, go very far to dig in, you know, I would think, so -- anyway, let's leave it there for now I think but --

MR. CHEW: Okay.

MR. GRIFFON: -- the last thing I would say, just -- just as a follow-up, I don't know if we specified that as an action, but Brant, you said you -- you will post these monthly dosimetry progress reports, can you --

DR. ULSH: Yes.

MR. GRIFFON: -- put those on the O drive.
DR. ULSH: It's on my to-do list.
MR. GRIFFON: All right, I didn't know if I got that or not. Okay.
Any -- I think we may need some informal calls, at least between now and the meeting.
DR. WADE: I think so.
MR. GRIFFON: I'm also going to work with Lew on -- the first day we have a subcommittee meeting, but we also probably need to schedule a workgroup -- some workgroup time --
DR. WADE: Right.
MR. GRIFFON: -- so that we can present on the next day to the full Board.
MR. MEYER: I also think some calls between would be --
MR. GRIFFON: Yeah, I expect those to happen and we'll -- we'll e-mail back and forth. We know how to get ahold of each other, so -- but thanks for all your work.
DR. WADE: Thank you for your leadership. Thank you all very much for your time.
We're going to end the call now. Thank you --
MR. GRIFFON: Thanks, everybody.
DR. WADE: -- all on the call for your patience

in trying to hear through --

(Whereupon, the meeting was adjourned at 5:15 p.m.)

CERTIFICATE OF COURT REPORTER

STATE OF GEORGIA

COUNTY OF FULTON

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the day of August 31, 2006; and it is a true and accurate transcript of the testimony captioned herein.

I further certify that I am neither kin nor counsel to any of the parties herein, nor have any interest in the cause named herein.

WITNESS my hand and official seal this the 30th day of September, 2006.

_____

STEVEN RAY GREEN, CCR

CERTIFIED MERIT COURT REPORTER

CERTIFICATE NUMBER: A-2102