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CENTERS FOR DISEASE CONTROL AND PREVENTION  
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

convenes the

SC&A REVIEW OF THE MALLINCKRODT TBD REV.0

JANUARY 18, 2005

The verbatim transcript of the above-mentioned meeting held at NIOSH, Cincinnati, Ohio, on January 18, 2005.

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-- "\*" denotes a spelling based on phonetics, without reference available.

-- (unintelligible) signifies speaker failure, usually failure to use a microphone.

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

(9:00 a.m.)

1  
2  
3 **DR. NETON:** I guess since Stu isn't here, I'll  
4 kick it off for him. Welcome. Welcome,  
5 everybody, to this review meeting. This is the  
6 first such meeting of a profile review. We  
7 didn't do this for Bethlehem Steel. We sort of  
8 did it by phone, I think, early on. And I  
9 guess -- it's my understanding of the cover  
10 letter that came with the report that this goes  
11 a little bit beyond factual accuracy, per --  
12 per the Board's recent deliberations.

13 A couple of housekeeping issues before we get  
14 started. There is a break room -- before you  
15 go through the big set of double doors into the  
16 main hallway, just to the right, there is a --  
17 two restrooms and a kitchenette area. And  
18 there is a coffee pot there. It's sort of  
19 catch as catch can. It's -- I guess offered  
20 up. I don't know whose coffee pot it is, but  
21 it's available.

22 If you do want refreshments, though, beyond  
23 that, if you go through the doors out into the  
24 hallway, about a third of the way down on the  
25 right is a regular vending area break room with

1 coffee machine and soda and snacks, that sort  
2 of thing. So that takes care of the comfort  
3 things, I think.

4 Emergency-wise, I think if the alarm goes off  
5 you will go right out this door, exit  
6 immediately left and go down the stairs, and  
7 the rally point is standing right on that hill  
8 behind these windows, so if the fire alarm  
9 should go off --

10 **DR. TOOHEY:** In case of an explosion.

11 **DR. NETON:** An explosion, yeah. Outside of  
12 that, I think maybe we should go around the  
13 table and introduce ourselves one pass for Ray  
14 Green. We are being -- and Ray Green is our  
15 court recorder and -- today and so we need to  
16 take some caution in not talking over each  
17 other and identifying ourselves when -- when  
18 possible so that he can capture this in its  
19 entirety. This will be published on our web  
20 site, for transparency, for the general public.  
21 I guess I'll start. I'm Jim Neton, NIOSH.

22 **MR. RUTHERFORD:** I'm LaVon Rutherford and I'm a  
23 health physicist for NIOSH.

24 **DR. TOOHEY:** I'm Dick Toohey, director of the  
25 ORAU team.

1           **MR. FLEMING:** Kenny Fleming, health physicist  
2           on the ORAU team.

3           **MR. ADLER:** Tim Adler, I work on the ORAU team.

4           **MR. SCALSKY:** Ed Scalsky, ORAU team.

5           **MS. WESTBROOK:** Janet Westbrook, ORAU team.

6           **MS. ROBERTSON-DEMERS:** Kathy Robertson-DeMers,  
7           Saliant, Inc.

8           **MR. FITZGERALD:** Yeah, Joe Fitzgerald. I  
9           manage the task one for SC&A.

10          **MS. MUNN:** Wanda Munn, the Advisory Board.

11          **MR. ESPINOSA:** Richard Espinosa, the Advisory  
12          Board.

13          **MR. GRIFFON:** Mark Griffon of the Advisory  
14          Board.

15          **MR. BELL:** Tom Bell, Saliant, Inc.

16          **DR. NETON:** Okay. Well, great. Now we have  
17          two full days scheduled and we certainly are  
18          going to take all the time it takes to get  
19          through this. We're not constrained to using  
20          all of both days, but if we need to, we will  
21          sit here and deliberate and discuss, as need  
22          be.

23          I'm not sure exactly what the format is. We  
24          did provide -- I think Stu provided on Friday  
25          some suggested topics for discussion. These

1 are not necessarily all-inclusive, but things  
2 that came to mind and that the team put  
3 together in a meeting prior to Friday.

4 I might suggest that we could start with these  
5 topics, could go through them and discuss --  
6 unless -- unless the SC&A team has another  
7 approach in mind -- go through those and then  
8 we may end up going back page by page to make  
9 sure that anybody that has comments that  
10 weren't addressed and those discussion topics  
11 were identified. That's just -- just a  
12 thought. I mean I'm not trying to force that  
13 on anybody, but --

14 **MR. FITZGERALD:** No, I think -- this -- this is  
15 Joe Fitzgerald. Certainly we're refining this  
16 process, and I thought the process last week  
17 with the dose reconstructions went fairly well,  
18 and we were able to go through the issues and  
19 we did get into, you know, other questions as  
20 we went. But I thought it was a pretty good  
21 exchange. I think that's what we're talking  
22 about here and I think that's what the Board  
23 was looking for was a more robust exchange  
24 between NIOSH and SC&A so that, you know, that  
25 -- that we have both the benefit of that

1 exchange as well as facilitating this report.  
2 And you know, clearly we want to be able to  
3 move this thing forward in time for the St.  
4 Louis meeting, so this'll help us on that.

5 **MS. MUNN:** And this is Wanda. I'm assuming we  
6 have a copy of those talking points for us all?

7 **MR. RUTHERFORD:** Yes, I'm getting ready to pass  
8 those out. I apologize.

9 (Pause)

10 **MR. FITZGERALD:** And I agree -- I agree with  
11 the suggestion that we use that as a structure  
12 to begin with, but not let that limit the  
13 discussion if there's other issues. I think  
14 that, you know, this is a good place to start.  
15 And -- and Jim, at some point, we have this  
16 sort of an update on Rev. 1. Is that something  
17 you want to just interject at some point --

18 **DR. NETON:** Yeah.

19 **MR. FITZGERALD:** -- maybe pick up on that?

20 **DR. NETON:** On Rev. 1?

21 **MR. FITZGERALD:** That certainly would be of  
22 interest.

23 **DR. NETON:** Oh, of our Rev. 1?

24 **MR. FITZGERALD:** Yeah.

25 **DR. NETON:** Yes, that's the first thing on our

1 discussion points, I believe.

2 **MR. FITZGERALD:** Okay, sure.

3 **DR. NETON:** And we can go there. We are  
4 waiting -- our -- one of our OGC legal staff  
5 members just tried to call in and the phone was  
6 apparently unplugged, so they should be calling  
7 in -- calling in any second and they'll --  
8 they'll be participating, as well, as need be.  
9 But you're correct, we did have on the agenda  
10 here an update on status of Rev. 1. I'm trying  
11 to think if there's anything else I need to say  
12 before we get going. I don't think so.

13 So is anyone from ORAU prepared to talk about  
14 the status of where we are with Rev. 1? Janet  
15 or Ed?

16 **MR. SCALSKY:** Janet would be the best one.

17 **DR. NETON:** And in general terms, where are we,  
18 what's the time line, that sort of thing?

19 **MS. WESTBROOK:** I can't tell you about the  
20 schedule because those decisions are made above  
21 my level. But one thing that I did notice  
22 about this SC&A review is it's based on the  
23 Mallinckrodt revision of last October. And  
24 that was -- I think should have been regarded  
25 as an early draft, and NIOSH had not had time

1 to review it all and that's why the post-  
2 operations period -- that was all done, but it  
3 wasn't included in this vers-- in the version  
4 that you reviewed because NIOSH had not had  
5 time to review it by the time -- the October  
6 time frame.

7 I made a subsequent draft in March, but I was  
8 told to put that on hold until they had  
9 finished collecting the film badge data so that  
10 we could come up with the surrogate worker  
11 table.

12 In the meantime, also in the spring, a lot more  
13 data and information from the early years like  
14 1942 to '46, say, came on the O drive, and so I  
15 mined all of those documents for information  
16 and data.

17 And subsequently I was told that the schedule  
18 for collecting the film badge data and other  
19 data tabulation -- which is not done by the  
20 same task --

21 **DR. NETON:** Janet, could you hold on just --  
22 Hello?

23 **MS. HOMOKI-TITUS:** (Via telephone) Hey, it's  
24 Liz and Rob.

25 **DR. NETON:** Hi, Liz, Rob. Sorry the phone was

1 unplugged.

2 **MS. HOMOKI-TITUS:** That's all right.

3 **DR. NETON:** Okay, you're on.

4 **MS. HOMOKI-TITUS:** Okay. Do you have any of  
5 these documents electronically that somebody  
6 could send us at some point so we could look  
7 over them?

8 **DR. NETON:** Yes, we can.

9 **MS. HOMOKI-TITUS:** Good, thanks.

10 **DR. NETON:** Okay. Okay. Sorry, Janet, go  
11 ahead.

12 **MR. BELL:** Janet, before you start back in, can  
13 I ask a quick question? This is Tom Bell. You  
14 mentioned the O drive and all the data on the O  
15 drive.

16 **MS. WESTBROOK:** Yes.

17 **MR. BELL:** I don't believe we have access to  
18 the O drive.

19 **MS. WESTBROOK:** The O drive is the document  
20 library.

21 **MR. BELL:** Oh, is that what you call the  
22 database where all the documents are?

23 **DR. NETON:** Yes.

24 **MS. WESTBROOK:** Yes.

25 **MR. BELL:** Oh, okay, I didn't realize it was

1           synonymous -- the same thing. Thank you for  
2           the clarification.

3           **MS. WESTBROOK:** When -- and if I --

4           **MR. BELL:** It sounded like it was something  
5           different.

6           **MS. WESTBROOK:** For the rest of this meeting,  
7           if I refer to the O drive I am speaking only of  
8           the document library.

9           **MR. BELL:** The document database.

10          **MS. WESTBROOK:** Right.

11          **MR. BELL:** Super. Thank you for the  
12          clarification.

13          **MS. WESTBROOK:** See, I was confused in here by  
14          the references to ORAU database because I don't  
15          think of that document library as a database,  
16          although you can find the documents using a  
17          database search. Since the documents contain  
18          so much text and data and they're in the PDF  
19          format, the not really findable, searchable  
20          format, that's why I think of it as more of a  
21          library. You -- you go -- you can find the  
22          book that the database, but then when you open  
23          it up and you want to find data, you have to  
24          manually hunt down through the pages yourself  
25          and type the data in yourself, so whatever we

1 call it -- maybe we should just think of one  
2 term we're going to use throughout this whole  
3 meeting.

4 **DR. NETON:** That's a good point. I think it is  
5 the equivalent to what you guys would call the  
6 site research database.

7 **MR. BELL:** That's the one we were -- yeah, we  
8 have a little icon and we click on and --

9 **DR. NETON:** I think the site research database  
10 may have some, as Janet has indicated, front  
11 end associated with it that allows a little  
12 easier navigation, where the O drive is just  
13 files -- right? Files of PDFs, so --

14 **MR. BELL:** The SR interface icon is the way  
15 that we get into that, through that mechanism.  
16 Right? And then it goes to the O drive for the  
17 documents.

18 **DR. NETON:** The O drive -- it depends on where  
19 you reside, what -- what drive letter it might  
20 have. If you're working from NIOSH it may be a  
21 different number than if you're working from  
22 ORAU, but --

23 **MR. BELL:** I'm glad you clarified that 'cause I  
24 thought we were missing something I didn't  
25 have. That's good.

1           **DR. NETON:** Great.

2           **MR. BELL:** Thank you.

3           **MS. WESTBROOK:** Well, anyway, I think I was  
4 talking about the collection of the data and  
5 the tabulation of the data. And there's  
6 something called tools, which is probably --  
7 setting up the data in like maybe an Excel  
8 sheet with some macros to facilitate the use of  
9 the data by the dose reconstructors eventually.  
10 Okay. So all of that -- I have been told, and  
11 maybe somebody can correct me, but the  
12 finalization of the TBD for complete use  
13 essentially depends on the completion of that,  
14 which as I say is done by another task and so I  
15 can't even tell you about the schedule.  
16 When I put out the last -- the latest revision,  
17 which is the August 2004 revision -- so we're  
18 calling that Rev. 01, although I think it has  
19 no official status -- that is in internal  
20 review right now. I do not know whether or not  
21 it has gone to NIOSH.

22           **DR. NETON:** It has not.

23           **DR. TOOHEY:** This is Dick Toohey.

24           **MS. WESTBROOK:** It has not.

25           **DR. TOOHEY:** Let me make one comment on the

1 data. We recently got I think the last six  
2 boxes of Mallinckrodt data out of the Oak Ridge  
3 operations office vault after a lengthy  
4 classification and security review, which is  
5 unfortunately the nature of the business. And  
6 so we've got those now. They're being scanned  
7 and then data entered into the spreadsheets, so  
8 there's still some analysis to do to develop  
9 coworker exposure profiles and -- and that sort  
10 of thing before that data can actually be used  
11 to support dose reconstruction. But the  
12 description of the data and all that we've  
13 already got and that can be -- I think Janet's  
14 probably working on including that in the  
15 Technical Basis Document. But the actual  
16 tables in the document that says this year that  
17 job category used this number are still a  
18 little ways down the road.

19 **MS. WESTBROOK:** That's correct. However, we  
20 did make the -- because the August version is  
21 so much further forward in terms of maturity  
22 than the version that the SC&A people reviewed,  
23 I -- I think it's probably -- I mean we should  
24 -- we could talk about the deficiencies of that  
25 old one, but you should realize that a lot of

1 the things that were criticized there are moot  
2 now because they have been changed. They  
3 already were in the process of being changed,  
4 or even already had been changed when the SC&A  
5 comments were received.

6 **MR. BELL:** This is Tom Bell. I just want to  
7 comment -- we were aware of that, and the  
8 trouble is the Board wanted us to proceed  
9 anyway with the Rev. 0, so that's what we had  
10 to work with and --

11 **MS. WESTBROOK:** Right.

12 **MR. BELL:** -- that's what we're commenting on.

13 **DR. NETON:** I think that's totally fine -- this  
14 is Jim. You can only review what you have, and  
15 then -- and frankly, that's what's published on  
16 our web site and that's what we can officially  
17 use to do dose reconstructions, so that's  
18 reasonable.

19 **MR. BELL:** And we're very pleased to hear it's  
20 progressing.

21 **DR. NETON:** I just wonder -- I'm sorry, were  
22 you finished, Janet, or --

23 **MS. WESTBROOK:** Well, I just wanted to say  
24 briefly that upgrades between then and now,  
25 besides the early data and a -- many

1 clarifications -- for example, in the original  
2 one I'd had to say it is thought that or  
3 probably or whatever, I may have discovered a  
4 document that really nailed that down so then I  
5 can state that with certainty.

6 Also, we didn't have any neutron doses in  
7 there. This would arise from the alpha neutron  
8 reactions, so this was kind of a side trip  
9 while our task came up with a methodology for  
10 doing this and we reviewed it, and I did these  
11 calculations for the forms that were relevant  
12 at Mallinckrodt. And that included the thorium  
13 fluoride that they had as an intermediate  
14 product.

15 Also in those documents it was found that they  
16 had, for several years, a substantial radium  
17 beryllium source also producing neutrons, so  
18 that dose is now mentioned in there.

19 We've made some refinements, based on more  
20 knowledge, to the post-operations period. And  
21 I think that is pretty well complete. However,  
22 we gave the methodology for the alpha neutron  
23 stuff and the post-operations stuff to NIOSH  
24 many moons ago and we haven't had an official  
25 word from NIOSH as to whether that's been

1           blessed by them yet.

2           So in terms of your approval now or in the  
3           future of that methodology, I have to say I  
4           don't know what NIOSH's position is and so I  
5           don't know the direction that the TBD will go  
6           on that in the future.

7           Okay, I think that basically sums --

8           **MR. FITZGERALD:** Let me raise one question --  
9           this is Joe. This is really for the Board and,  
10          you know, you know what I'm going to ask  
11          because this is going to be a little  
12          complicated in terms of how we present this.  
13          And I think it's a very valid -- and of course  
14          we want -- you know, bent over backwards trying  
15          to figure out how to put this in context and to  
16          reflect exactly what Janet's talking about,  
17          which is we're shooting at a moving target.  
18          And actually the target's sort of way back  
19          there, but you know, I think it's going to be  
20          very legitimate for ORAU and NIOSH to raise  
21          issues of, you know, this is moot because --  
22          and we're going to certainly hear things that  
23          we can't see officially. And yet I think in  
24          terms of reflecting the body of information  
25          accurately, we probably need somehow to

1           acknowledge that, you know, the data reflects  
2           something other than what we were able to  
3           review. And this won't be the first time this  
4           will happen, I suspect. So in terms of how to,  
5           you know, advise the Board and reflect what  
6           currently is the circumstance, I guess I --  
7           we're looking for a little guidance because  
8           we're doing a snapshot of what we have. But  
9           what we're probably going to hear is analyses  
10          and data which has in fact superseded that  
11          original document. And when we produce this  
12          review -- and we've already drafted it -- but  
13          present it, would that necessarily be perhaps a  
14          supplement, an appendix, perhaps something that  
15          would be reflected in the preface of saying,  
16          you know, even though this is the snapshot, we  
17          understand -- and we have to say that; I doubt  
18          we're going to actually see anything officially  
19          if it hasn't been blessed by NIOSH. So we're  
20          going to need to do something. Otherwise it's  
21          going to be a little -- I suspect it's going to  
22          be a little hackneyed in a sense because we'll  
23          hear things that will be very good and  
24          legitimate responses to our issues, but we  
25          won't have anything -- anything on -- in

1 writing or in paper to actually demonstrate in  
2 public, as you will need to do in St. Louis.  
3 So it's sort of -- I don't know how one deals  
4 with that issue, and I guess that's -- this is  
5 going to be something we'll have to grapple  
6 with, what to do if there's not an official --  
7 something withstanding that is in the public  
8 arena. But yet in terms of having a valid and  
9 good discussion of the technical issues, we're  
10 going to hear things that will be, in a sense,  
11 conveyed to us in this form.  
12 Now this is on the record, so in a lot of  
13 respects this does have standing from that  
14 standpoint. So we certainly can have a part of  
15 the report say this is not reflective of Rev. 0  
16 but is reflective of what has been said to us  
17 on the record with the Board present in this  
18 particular form, which might be the way out.

19 **MS. MUNN:** This is Wanda Munn. I've been  
20 concerned about this for a little while. And I  
21 think we're all feeling our way along with this  
22 process and don't know exactly how to address  
23 that in a firm manner so everybody's  
24 comfortable with it. But it's clear to me that  
25 it's key that these discussions are of record

1           and that Board members are present when these  
2           discussions are held.

3           My personal preference would be to have perhaps  
4           a very brief supplement to existing documents  
5           that are in the public arena available for the  
6           Board and for the public prior to the time we  
7           have real public input on these things, simply  
8           because without it -- were I a member of the  
9           public and not privy to these discussions -- I  
10          would find the information given to be suspect,  
11          without some written evidence that other  
12          information is available and is in the works.  
13          How we go about and when we go about providing  
14          that supplement it seems to me would be very  
15          difficult for you. Maybe you have some feel as  
16          to how that might best be done.

17          **MR. FITZGERALD:** Well, I -- you know, I think  
18          this record will provide an ORAU/NIOSH  
19          perspective, will refer to documents and data  
20          that have been collected but not published,  
21          which sort of get-- which is sort of a halfway  
22          house of providing information on a site, which  
23          certainly we can respond to and acknowledge,  
24          but with an asterisk, which is that there is no  
25          Rev. 1 -- no actual document that -- of

1 standing that's been approved by NIOSH that we  
2 can actually point to. So it will sort of be a  
3 -- again, it'll be an interim dialogue, which I  
4 think is valuable; don't get me wrong, I think  
5 it's valuable -- which we might reflect in that  
6 context in the -- in our rep-- our review. You  
7 know, we prefaced our review with enough  
8 qualifiers that we know this is all going on.  
9 This takes it a step further and will have an  
10 exchange on issues which reflect what's been  
11 done even though it hasn't been published, and  
12 that would have to go into the report in that  
13 context that, you know, this does not -- this  
14 does not reflect a formal document. It  
15 reflects a discussion which is founded on  
16 NIOSH's and ORAU's knowledge of that -- what's  
17 in the document, but the document's not there  
18 yet. It could change. It might not be the  
19 final -- but this is where things stand right  
20 now.

21 It seems to move the ball forward as far as  
22 providing information, but I think it's -- it  
23 falls short of what you're talking about, which  
24 is something that's out there, can be reviewed,  
25 evaluated, has standing. That's -- that hasn't

1           happened yet. It may not happen for a little  
2           bit more time, apparently.

3           **DR. NETON:** I was going to suggest a couple of  
4           things. I think -- we were talking a little  
5           bit about process here, and we've -- it's been  
6           our position all along that we're going to  
7           release a document, a profile, as soon as we  
8           believe it's ready to start performing dose  
9           reconstructions, whether it can do all cases or  
10          not. And that's essentially what we've done.  
11          I was just thinking when Dick was commenting  
12          that they've uncovered six more boxes that just  
13          got through classification review, that's going  
14          to delay the next revision. But I would  
15          suggest that we probably shouldn't delay any  
16          revision that's been refined thus far from  
17          being published because it provides additional  
18          information that may be useful to do dose  
19          reconstructions.

20          So the way this works then is -- this is one of  
21          the comments I had -- a global issue that I was  
22          going to bring up. When we issue the profile  
23          we use it to the extent possible. Then as it  
24          expands and grows and becomes more complete, we  
25          bring on board more and more cases. So to --

1           and I appreciate SC&A's caveat that they put in  
2           the review. It was very clear that, you know,  
3           this profile has been used principally to  
4           compensate -- provide cases that were over 50  
5           percent to the Department of Labor. I believe  
6           there is one case that has been processed that  
7           was not compensated. But then again, one needs  
8           to look at that case in the context of what  
9           information was in the profile and was that  
10          sufficient information.

11          So there's an iterative process here, and I'm  
12          not sure how that falls into the SC&A review  
13          and the task itself because I think the intent  
14          of the task order was to do a once review and  
15          then say okay, that's good, move forward. And  
16          in fact that's not what's happening in  
17          practice, from NIOSH's perspective, as far as  
18          issuing complete documents that cover all the  
19          waterfront. So I don't know how to address  
20          that other than to acknowledge that that's  
21          what's happened. And we do believe, though,  
22          that the review is valuable. I mean certainly  
23          there's a lot of issues that have been raised  
24          that we may have not covered. But again, I  
25          think the next revision will cover a

1 substantial portion of the issues raised.  
2 That being said, I do agree that we can only  
3 review what we've done, so we can move forward  
4 and --

5 **MR. GRIFFON:** I think I -- my initial reaction  
6 when I read the front cover was when did we as  
7 a Board vote on moving forward with the  
8 Mallinckrodt site profile review? But I think  
9 in generic terms we probably did say we need to  
10 expedite these things. Having known more of  
11 these details, we might have decided maybe to  
12 hold off. But then we have another issue at  
13 Mallinckrodt which is we were expecting SEC  
14 petitions, or I think we knew that there was  
15 petitions coming down the line so we thought it  
16 might be good to expedite this for that reason.  
17 So we were -- we were in a box there.

18 **DR. NETON:** Right.

19 **MR. GRIFFON:** Having said that, I think I agree  
20 with Joe is that if this meeting can take us,  
21 with a transcript, slightly further than the  
22 response that we're making -- you know, I saw  
23 some findings that basically said however,  
24 we've discussed this with NIOSH and this seems  
25 to be -- is in process and being addressed in

1 Rev. 1.

2 I think we need to take it just a little  
3 further so that at least everybody's  
4 comfortable with the resolution process. And  
5 then the final step might be this addendum  
6 where you have the hard -- the hard document  
7 down the line. But at least the approach is  
8 agree-- you know, in -- in theory and  
9 discussion, is agreeable to everyone.

10 **MR. FITZGERALD:** Yeah, this is Joe again. I  
11 think the intent was a snapshot. I think  
12 you're quite right. But you know, what's  
13 apparent is, you know, you're moving  
14 progressively forward, so that snapshot is  
15 always going to be behind where you actually  
16 are. And for the sake of the Board and the  
17 public, we should have -- to the extent we can,  
18 and it's a process issue, I agree -- the best  
19 snapshot in this review and it should reflect  
20 what -- where you are, even if we have to  
21 qualify and say that there's not a Rev. 1 out  
22 there, but this is what came out of the  
23 discussion and -- and qualify it in the sense  
24 that it doesn't paint you in a corner, either,  
25 'cause you haven't finalized it and approved

1           it. So it's going to have to have that context  
2           and it may be a separate part of our review  
3           that reflects this discussion and says, you  
4           know, this is -- seems to be where things are,  
5           but not necessarily where the -- will it be in  
6           the ultimate document, and leave it go at that  
7           and do something that would be a supplement  
8           once Rev. 1 is issued at some point.

9           And I only say that because it seems like --  
10          I'm not so sure, given how outdated this is,  
11          that that would stand as the review for  
12          Mallinckrodt just because it leave so many  
13          questions not answered between loose ends, and  
14          somebody can come back and say well, this  
15          review was outdated the moment it was issued,  
16          and that would be difficult to --

17         **MR. BELL:** Joe, could we explore maybe whether  
18         NIOSH might be willing to provide a summary of  
19         those things that are going to be done in Rev.  
20         1 that kind of says we are working on those  
21         issues and the new Rev. 1 will address those,  
22         so that as people begin to read this or as  
23         we're in the public arena there's some evidence  
24         supporting the fact that you're actually  
25         working on some of those issues?

1 I mean obviously there's the post period we  
2 know is being worked on and now you have new  
3 data out of ORAU that's there in the ORISE  
4 vault that's going to help. It would just seem  
5 to me that would be a good way to start, say we  
6 are -- we are working on these major areas and  
7 we will have more information in Rev. 1, and  
8 that will assure people that we're not leaving  
9 this alone. And it appears, from what you're  
10 saying, you're going to have a lot of new data  
11 in the early period that's going to resolve a  
12 lot of our concern about the early period dose.  
13 And that's just significant to know that's  
14 coming.

15 **DR. NETON:** Yeah, I -- we're going to formally  
16 respond, anyway. I mean I don't think this  
17 meeting is the end of the day. We will, after  
18 our discussion, have some formal comments on  
19 this. And I suspect very strongly that  
20 included in those comments will be the areas  
21 where we identify movement, you know, we're  
22 going to cover in the future issues.  
23 One thing, in looking at the discussion topics,  
24 that we did -- and we will do that.  
25 In the discussion topics, by the way, we've

1 identified -- and I think this is good. In  
2 perusing these briefly, I think that most of  
3 these are issues that we're not covering in the  
4 Rev. and they're issues where we have some  
5 concerns about either philosophy or -- or  
6 specific instances that -- issues that you  
7 raise that would be good for discussion,  
8 because even if we do complete Rev. 1, I  
9 believe these issues will still be outstanding.  
10 So that, in a sense, is a good thing.

11 **MR. FITZGERALD:** So just to sort of tie it all  
12 together, we would perhaps use your response  
13 after this session to address not only, you  
14 know, issue by issue sort of where things --  
15 where you see things, but also what Rev. 1, at  
16 least at this point, would address in the  
17 context of these kinds of issues, so that if we  
18 were to put that as an addendum to the report,  
19 that could be referred to as, you know, your  
20 status as far as treating these issues in a --  
21 in this case, Rev. 1, rather than trying to put  
22 words in your mouth and saying this is what we  
23 heard and pointing to a transcript. Perhaps  
24 that would be this interim piece that would say  
25 here's how Rev. 1 would address these issues,

1 and you can use whatever words you want and  
2 qualify it any way you want. That seems to be  
3 a cleaner way. And I agree with Tom that that  
4 would be how we deal with this in terms of  
5 issuing this report at this point.

6 **DR. NETON:** In a sense. I mean that -- what we  
7 would end up saying is we are in actual  
8 agreement with your comment. We agree that  
9 that area, whatever it may be, is lacking  
10 clarity or definition and we will certainly  
11 address that. That's good.

12 **DR. TOOHEY:** Yeah, if I may -- Dick Toohey for  
13 the ORAU team. It's certainly our take on it -  
14 - in an ideal world, all the comments you made  
15 on Rev. 0 would like to have addressed in Rev.  
16 1. But reality always leaves the paper trail  
17 and we may find six more boxes of data next  
18 week. So what I would hope to do in our  
19 response to the comments and in Rev. 1, address  
20 as many of these things as we can now --  
21 hopefully enable us to do more dose  
22 reconstructions than we can now -- but I  
23 wouldn't be surprised if there are some things  
24 that we can't resolve right now that may have  
25 to be deferred to Rev. 2, and we'll identify

1           those. 'Cause as Jim mentioned, it's certainly  
2           a moving target, and any time we look at  
3           anything it's just a snapshot in time. So it's  
4           just going to be very much an iterative  
5           process.

6           **DR. NETON:** Yeah, we may --

7           **DR. TOOHEY:** I was -- just say then I assume  
8           when Rev. 1 is issued, the Board would want you  
9           guys to formally go over it and say okay, does  
10          it address these issues that were previously  
11          raised.

12          **DR. NETON:** Well, that's certainly for the  
13          Board to decide. We don't want to speak for  
14          the Board or anybody, but --

15          **MR. FITZGERALD:** This is a generic issue, so  
16          maybe it's something that would be useful to --  
17          for you to give us advice and direction on as  
18          how you want to handle that issue. It's going  
19          to be something that'll come up with probably  
20          almost every review.

21          **DR. NETON:** For example, when Rev. 1 -- if we  
22          issue Rev. 1 before incorporating say these six  
23          boxes of records, I suspect there are a number  
24          of dose reconstructions that we can do,  
25          particularly people who worked in the more

1 recent time frames. And we hate to hold those  
2 in the balance until, you know, the number of  
3 months it took to go through those boxes and  
4 get the pedigree down and put them into Rev. 1.  
5 We wouldn't want to wait that long. So I think  
6 that's -- you're starting to see how we sort of  
7 perceive these Technical Basis Documents as not  
8 necessarily the be-all/end-all from the first  
9 pass. But the real question is, is there  
10 anything in there currently that is just -- the  
11 technical approach is off base or could be more  
12 claimant favorable, or we think it is and you  
13 guys think it's not -- those kind of issues,  
14 which I think is what's covered in some of  
15 these discussion points.

16 **MS. WESTBROOK:** I have a question. This is  
17 Janet. What is in those six boxes? Is it  
18 actual -- I thought you said data. Is it like  
19 film badge data, urinalysis data that just  
20 requires somebody to go through and tabulate  
21 the numbers? Or are they things like memos,  
22 letters, procedures, stuff like that that  
23 provide background data, dates and stuff  
24 like... Okay. So the digestion of the six  
25 boxes, so to speak, depends on what it is.

1           **MR. BELL:** Can I add to that? I'd like to know  
2 whether they're raw data cards for people's  
3 uranium dust exposure levels in the early  
4 periods. That would be very helpful.

5           **DR. TOOHEY:** My understanding is it's mostly  
6 individual monitoring data.

7           **MR. FLEMING:** This is Kenny Fleming. I've not  
8 seen -- I've seen three boxes of data that came  
9 out, but I don't believe they're a part of this  
10 six that Jack Beck\* picked up. What we've been  
11 able to see is some breath radon results back  
12 in '46, '47, '48. We've seen external  
13 dosimetry information. And again, I guess it's  
14 on a weekly basis. But there's very little air  
15 dust information --

16           **DR. TOOHEY:** Very little of that.

17           **MR. FLEMING:** -- that we found back in the '46,  
18 '47 time frame -- right now.

19           **MS. WESTBROOK:** Well, my point -- this is  
20 Janet. My point was going to be, in terms of  
21 putting Rev. 1 on hold and going --

22           **DR. TOOHEY:** No, we're not going to put Rev. 1  
23 on hold --

24           **MS. WESTBROOK:** Just hear me out, hear me out.  
25 My going through those and seeing if there's

1 anything that makes a difference to any  
2 conclusion that I reached in there. Now the  
3 film badge data won't make any difference  
4 because I'm not dealing with that. I'm not  
5 tabulating and analyzing that. And urinalysis,  
6 breath radon data, except as -- if I said well,  
7 we have the data for these years but this  
8 year's missing and there it is in the box, then  
9 I can now say hey, it's not missing anymore,  
10 you know, we have -- so I -- my feeling is it  
11 would be more cost-effective -- and this is the  
12 engineer in me speaking -- for me, before I do  
13 anything more to this revision, to -- to find  
14 out what's in those boxes and see if it would -  
15 - if it only took me a couple of weeks to  
16 incorporate that, would that not be worth it?  
17 **DR. NETON:** Yeah. I think we're not really  
18 here to flesh out that whole process at this  
19 point. I mean we --  
20 **MS. WESTBROOK:** Sure, but I'm --  
21 **DR. NETON:** -- need to deliberate --  
22 **MS. WESTBROOK:** -- just pointing out --  
23 **DR. NETON:** -- behind the scenes and figure out  
24 what makes most sense for us to get out the  
25 door and when.

1           **MS. WESTBROOK:** Terms of when Rev. 1 actually  
2 emerges for use.

3           **DR. NETON:** Yeah, and we'll certainly discuss  
4 that, you know, among ourselves as to where --  
5 where we -- you know, where we want to make the  
6 cut point on Rev. 1 versus another. You make a  
7 good point.

8           **MR. GRIFFON:** Just one thing. As far as the  
9 comment resolution part of this, just to get  
10 back to that --

11          **MS. MUNN:** Identify yourself, Mark.

12          **MR. GRIFFON:** I think everybody knows me. Mark  
13 Griffon.

14 I guess -- I guess what we -- from the Board's  
15 standpoint, I hope that on these comments --  
16 we're going to have to think about tracking  
17 them, as well. So if there's not comment  
18 resolution right away during this first review,  
19 what happens to them? And I think to the  
20 extent we can, it would be nice if -- if your  
21 written reply, you know, was complete enough  
22 that SCA could say we agree with that -- you  
23 know, that -- that resolves that problem and --  
24 and their approach will be included in -- you  
25 know, more than just to say it's going to be

1           addressed in Rev. 1. We can't just leave that  
2           hanging out there. Either we have to track it  
3           through and do an addendum report, or -- or you  
4           have to have a complete reply to the comments  
5           and say it's going to be addressed in Rev. 1 by  
6           doing the following, and then SCA has to say we  
7           agree with this approach or don't agree or  
8           whatever, you know.

9           **DR. NETON:** But we may or may not know exactly  
10          what the following is.

11          **MR. GRIFFON:** I know.

12          **DR. NETON:** We may agree with the concept --

13          **MR. GRIFFON:** So we may have to follow some of  
14          these.

15          **DR. NETON:** Sure.

16          **MR. GRIFFON:** Right. Right.

17          **DR. NETON:** Yeah, my thought process here was  
18          that if we did come to some resolution in this  
19          meeting, then SC&A would go back and revise the  
20          report accordingly to remove that issue or  
21          modify that issue. But yeah, where we still  
22          have issues and disagreements, then we will --  
23          I think that's what we need to do, identify the  
24          issues that are outstanding and when what we --  
25          what our path forward's going to be to take

1 care of --

2 **MR. FITZGERALD:** Yeah. This is Joe, and I  
3 think as we experienced last week with the dose  
4 reconstruction review, we have to be real clear  
5 with each issue what the disposition of that  
6 issue is. Either we agree that we can accept  
7 that comment, change it -- either way -- or  
8 somebody's going to go back and get more  
9 information and do more analysis and then make  
10 a decision. And that's where I think, you  
11 know, one has to track well, what was the  
12 decision ultimately on that -- or we just don't  
13 know, but we'll figure it out. So last week I  
14 got the impression that we had a yes, we agree;  
15 we'll change it. No, we don't agree; we'll  
16 agree to disagree. Or we need more information  
17 or we need to think this -- think about it  
18 more, and that was actually a response to a  
19 number of the issues last week. And that's  
20 where I think you have to, you know, find out  
21 what the ultimate disposition would be. And as  
22 we said, we're kind of (inaudible) this  
23 process, but I think that's where I got the  
24 sense that as long as we're very crisp with  
25 each issue as to what happened with that issue,

1           then I think we come out of it with a pretty  
2           good idea.  But I think that ought to be  
3           documented and perhaps be on this record that  
4           would be something that when we get the NIOSH,  
5           you know, reply, perhaps that could be  
6           reflected in the reply is that, you know, sort  
7           of each issue went where.  And then -- but I  
8           think that would satisfy your comment, that  
9           that would be a record.  And also it would be a  
10          means by which the review can reflect this  
11          discussion so that there's no -- people look at  
12          the transcript and they say well, that went  
13          somewhere.  What happened to it?  Well, I think  
14          that'll be covered I think in the NIOSH reply  
15          as far as whether it was accepted, not  
16          accepted, dispositioned.

17         **DR. NETON:**  It's not clear to me whether this  
18         can all be done prior to the next Board  
19         meeting, though.  That -- I mean we're  
20         certainly going to strive for that, but I don't  
21         even know if we're on the agenda at this point  
22         to discuss our comments on the profile review.  
23         I don't know.

24         **MS. MUNN:**  Well, this is Wanda.  If you're not  
25         on board, then my personal feeling is you

1           should be on the agenda to do that because I  
2           cannot imagine that the Board members who are  
3           not here would not want to be brought up to  
4           speed.

5           **MR. FITZGERALD:** This is Joe again. Just I  
6           might also add that Mallinckrodt isn't,  
7           hopefully, reflective of the process. Because  
8           of the St. Louis meeting coming up as fast as  
9           it is, there isn't as much time I think for  
10          this disposition process. And my  
11          understanding, I guess from our discussions  
12          with Lew Wade on this disposition process, is  
13          that there would be a few weeks, if not even a  
14          month, to go through this, which would provide  
15          the kind of leeway I think that you're talking  
16          about, Jim, which is we need to have this  
17          exchange and need to have some documentation  
18          afterwards. That takes time. I think -- the  
19          understanding I have is that that time will be  
20          afforded for the future ones, but for MCW it's  
21          certainly a unique situation where we're  
22          playing catch-up and adding this thing in --  
23          this process in, shoehorning it in -- in order  
24          to be able to come back to the Board in time  
25          for the February meeting. So this is a little

1 bit tight and I understand what you're saying,  
2 that maybe we can't get everything we want this  
3 time, but for the record it would be useful to  
4 have that dispositioning and -- even if it  
5 comes after the meeting, we just need to have  
6 that somewhere.

7 **DR. NETON:** Oh, yeah, we're committed to doing  
8 that as soon as possible. I'm not sure exactly  
9 where this disposition -- when's this going to  
10 occur, before the Board meeting or not.

11 **MS. MUNN:** This is Wanda. If, at a minimum, we  
12 could get a clear definition of exactly what  
13 NIOSH agrees are issues, that in itself, in my  
14 view, would be immensely helpful.

15 **DR. NETON:** I think we can do that. We can do  
16 that. Remember that we also have the Bethlehem  
17 Steel --

18 **MS. MUNN:** Yes.

19 **DR. NETON:** -- issue and we are --

20 **MS. MUNN:** We're painfully aware of that.

21 **DR. NETON:** -- we are committed to having our  
22 responses worked out by the next Board meeting,  
23 even though at the last Board meeting it was  
24 agreed we could have some leeway in carrying  
25 over to the subsequent one, but we intend to

1           have that issue addressed at the Board meeting  
2           in St. Louis.

3           Okay. I just got a note handed to me that the  
4           recording equipment is here, and we had talked  
5           about taking a quick break where it made sense.  
6           And unless there's any other generic  
7           discussions, we'll take a ten-minute break.  
8           Ray can get his recording equipment in place  
9           and then maybe we can start with the discussion  
10          topics after the break. So around -- a little  
11          after 10:00 o'clock if we reconvene -- five  
12          after 10:00, maybe.

13          (Whereupon, a recess was taken from 9:55 a.m.  
14          to 10:15 a.m.)

15          **DR. NETON:** We had one person come in after we  
16          started and that's Mike down at the end. Mike,  
17          would you identify yourself and your  
18          affiliation for the record?

19          **MR. GIBSON:** Mike Gibson, a member of the  
20          Advisory Board on Radiation and Worker Health.

21          **DR. NETON:** Welcome, Mike. Okay. As we left  
22          it, we had some generic discussion about the  
23          process. I think we're in some agreement on  
24          that. And for the record, we have agreed that  
25          we're -- NIOSH is going to put together some

1 minutes of this -- this meeting, provide to  
2 SC&A prior to our formal response, just so that  
3 we can get some feedback as to the sanity of  
4 our interpretation of what we discussed and  
5 what we agreed to.

6 I had just two small issues before we get into  
7 the general -- suggested discussion topics I'd  
8 like to go over, just to get the sense from  
9 SC&A about where NIOSH's standing, in your  
10 opinion, of our issue is. And one is, we  
11 talked about it a little bit earlier, which is  
12 the purpose of the Technical Basis Document and  
13 how it's used.

14 And I found this in the Bethlehem Steel review,  
15 as well as the Mallinckrodt review, where  
16 there's a real understanding on SC&A's part  
17 that the profile should address how a dose  
18 reconstructor should do maximum and minimum  
19 dose reconstructions. I don't believe that was  
20 our intent, and I'm not sure why SC&A believes  
21 that those need to be both covered in the  
22 profile.

23 It is our opinion that the profile is really a  
24 document that describes the facts as they are  
25 available, and then allows the dose

1           reconstructor to use those facts. Whether he  
2           would use them or she would use them in a  
3           minimizing approach or a maximizing approach is  
4           totally up to the discretion of the health  
5           physicist doing the dose reconstruction. So I  
6           just wanted to just sort of broach that issue  
7           briefly.

8           I'm not sure it's the basis of any findings or  
9           anything, but I did find some language in there  
10          -- I think particularly on page 13 and 14 of  
11          the document -- where it -- some discussion at  
12          length about -- I see -- related to the minimum  
13          and maximum issue. And I think actually if you  
14          look at the last paragraph, it does say  
15          (reading) there are a number of findings and  
16          observations that address the issue of how  
17          minimum and maximum doses are estimated.  
18          I don't think there is anything in here that  
19          talks about minimum and maximum dose. It  
20          wasn't intended to. So I'd just like to raise  
21          that issue briefly and see what SC&A's opinion  
22          is on that.

23

24

(Pause)

25

**MR. FITZGERALD:** Tom, did you want to provide

1           some perspective on that?

2           **DR. NETON:** Yeah, just some perspective maybe  
3           so we understand where you're coming from on  
4           those issues.

5           **MR. BELL:** Well, the only thing we were  
6           wondering is -- we know that a number of claims  
7           you awarded were basically ones where you've  
8           done the quick minimum process and where the  
9           cancer's the right type, and mainly that's lung  
10          cancer and skin cancer. And we know that you  
11          haven't, except you just mentioned one case we  
12          didn't know about, but there's one case where  
13          you haven't really applied it yet to a worst-  
14          case situation where you're trying to get a  
15          maximum dose for an individual. And we just  
16          thought that there needs to be a little more  
17          definition in the TBD that describes how you're  
18          applying it.

19          In other words, people think that they're  
20          getting the advantage of the full maximum  
21          worst-case type of thing, and they don't  
22          understand this differential between the two  
23          techniques, as well. We tried to simplify some  
24          of our language in this so people understood a  
25          little better, but I think it's just an

1 interesting point, particularly in this  
2 situation where there seems to be a big  
3 difference whether if you're using the minimum  
4 technique and going ahead and compensating  
5 versus you're waiting until you get more data  
6 to do the worst case. The folks out there  
7 don't know that you're working on all that  
8 additional data that'll support that, and they  
9 think it's all being handled the same. They  
10 don't understand the differential.

11 So that's why we thought there needed to be a  
12 little more definition about that. Not that it  
13 has to be, you know, great detail, but -- but  
14 some application as to how that's being used,  
15 particularly in light of the Mallinckrodt  
16 process that have to deal particularly in this  
17 early period, which is I think where we really  
18 have to put a lot of emphasis.

19 **DR. NETON:** I guess our opinion on that is that  
20 the dose reconstruction itself is where the  
21 claimant should understand what was used. You  
22 know, we're not going to get into, in this  
23 meeting, about the quality or the adequacy of  
24 the dose reconstruction itself, but that's  
25 where we believe that the description should

1           be. And if one does a dose reconstruction --  
2           it's a maximizing dose reconstruction for lung  
3           cancer, for exam-- or minimizing for lung  
4           cancer, at a minimum, your lung dose is X and  
5           that's -- we're not going to analyze it any  
6           more because it's over 50 percent already --  
7           see, I'm not sure that that would really fit  
8           well in a site profile, which is really  
9           supposed to just provide the data available, to  
10          the extent possible, for the dose reconstructor  
11          to use to adopt either this minimum or maximum  
12          or full-blown approach. So in that sense, I  
13          think we believe that there is more latitude in  
14          the health physicist to make that  
15          interpretation. And in fact I'm not sure you  
16          could properly address all those issues in one  
17          document.

18         **MR. BELL:** Well, I think the --

19         **DR. NETON:** They're very circumstantially  
20          dependent.

21         **MR. BELL:** Yeah.

22         **MR. GRIFFON:** I think maybe what happened here  
23          in this situation was that you basically said  
24          that a lot of the -- the way the site profile  
25          was initially released was to handle these

1 cases where you could use minimum doses.

2 **DR. NETON:** Right.

3 **MR. GRIFFON:** So you know, I think SCA's  
4 observation is that, you know, the data's not  
5 there to handle these other ca-- you know, and  
6 that's why maybe they addressed it with that  
7 language, you know.

8 **DR. NETON:** True, true.

9 **MR. GRIFFON:** If all the data was in there,  
10 they may not have phrased it that way. I don't  
11 know, that's just a thought.

12 **MR. FITZGERALD:** The comment I would make would  
13 be I think we may both be right in the sense  
14 the site profile does provide the information,  
15 does not get into those issues. However, our  
16 review, in order to provide context -- I think  
17 sometimes the context is important for clarity  
18 -- we would allude to not only what the data is  
19 in the profile, but some information -- I think  
20 what Tom's referring to -- some information in  
21 context so it's understood how the data would -  
22 - would be applied. And not to go so far as to  
23 get into the dose reconstruction side, but  
24 enough so there's some understanding of where  
25 we're coming from as far as how the information

1           be used. So context I think is important from  
2           our standpoint, and I think even with Bethlehem  
3           Steel we got into a little bit of context as  
4           far as how the site profile would be applied.  
5           I think as long as we don't go too far and  
6           understand that the site profile itself can't  
7           go any further --

8           **DR. NETON:** That's fine, that's helpful,  
9           because I just didn't want -- I didn't want it  
10          to be interpreted that every site profile --  
11          like say if we had a full-blown information  
12          that we're going to get, we're not going to go  
13          in there and tell the dose reconstructor how to  
14          minimize or maximize doses. There are other  
15          procedures and documents that do that --  
16          supposed to be, anyway, so -- okay, so that --  
17          that's -- I just wanted to get a little context  
18          on that. That's fine.

19          **MS. ROBERTSON-DEMERS:** This is Kathy. In  
20          relation to that, what additional direction are  
21          you providing the dose reconstructors in  
22          relation to how to apply this TBD?

23          **DR. NETON:** Well, there are procedures on how  
24          to do dose reconstructions as far as the  
25          implementation guides and the flow -- the flow

1 diagram where you start using the -- you know,  
2 the smallest dose you can and if that person's  
3 compensable, then you're done. But if it's not  
4 compensable based on that, then you -- then you  
5 go add in the other source of exposure, whether  
6 it's external or internal, and do the same  
7 thing. If they still aren't compensable, then  
8 you go back and you maximize it. And if they  
9 aren't -- maximizing doesn't get them --  
10 doesn't put them over, you're done. But it  
11 doesn't, then you have to go and do a full-  
12 blown analysis of all the data, so there is a -

13

14 **MR. BELL:** Is that covered in your procedural  
15 guideline --

16 **DR. NETON:** Yes.

17 **MR. BELL:** -- the 003 and 006? Is that what  
18 you're --

19 **DR. NETON:** No, 00 --

20 **MR. BELL:** There's two procedural documents in  
21 external and internal.

22 **DR. NETON:** Yeah, I forget which number the  
23 procedure is, but --

24 **MR. RUTHERFORD:** There's actual -- I'm sorry,  
25 this is LaVon. There is an actual procedure

1           beside -- you've got the implementation guides  
2           for internal and external --

3           **DR. NETON:** One and two.

4           **MR. RUTHERFORD:** -- one and two, right. Then  
5           we have an actual procedure that decide-- that  
6           lays out the process for a dose reconstruction,  
7           and I think it's PR001, I think.

8           **DR. NETON:** I can't remember the number, but  
9           there's a -- it's the flow diagram that I've  
10          shown at several Board meetings that that's  
11          taken from.

12          **MR. BELL:** If I were to find that on your  
13          database, I would go to procedures and look for  
14          that number then? Is that what you're saying?

15          **DR. NETON:** Yeah --

16          **MR. RUTHERFORD:** Yes.

17          **DR. NETON:** -- in our procedures.

18          **MR. BELL:** I'm not sure that I've actually  
19          looked at that particular document.

20          **DR. NETON:** I'm sure that SC&A has it because  
21          they've reviewed all of our procedures.

22          **MR. FITZGERALD:** Yeah, it says task three.

23          **MR. BELL:** Oh, it's task three, okay.

24          **MR. GRIFFON:** Hans Behling (unintelligible)  
25          last time.

1           **MR. FITZGERALD:** Right, right.

2           **MR. BELL:** Okay.

3           **MS. ROBERTSON-DEMERS:** This is Kathy again. Do  
4 you have any specific procedures which address  
5 how to apply this particular TBD?

6           **MR. GRIFFON:** Site-specific procedures, you  
7 mean?

8           **MS. ROBERTSON-DEMERS:** Yeah.

9           **DR. NETON:** ORAU may have internal procedures,  
10 but I don't...

11           **MR. SCALSKY:** This is Ed Scalsky. The -- there  
12 are OTIBs, Technical Information Bulletins,  
13 that give specific instructions on, you know,  
14 the various aspects of -- of dose  
15 reconstruction, whether, you know, it's for  
16 neutrons or for gamma or beta, you know, but  
17 there are --

18           **MR. BELL:** It's not specifically Mallinckrodt,  
19 but it's in general.

20           **MR. SCALSKY:** No, it's in general.

21           **DR. NETON:** But say, for example, a person were  
22 going to do a maximizing external dose, they  
23 would go to the thing that talks about external  
24 and you would use the frequency to cycle times  
25 the number of badges that were recorded less

1 the detection limit, that sort of thing.

2 **MR. BELL:** Right.

3 **DR. NETON:** Those are sort of generic tools  
4 that are used, given the information in the  
5 site profile. If we know the detection limit  
6 is 20 millirem, for example, in some year, then  
7 that's what the document's supposed to present  
8 and that's what the dose reconstructor would  
9 use. And if the frequency exchange was weekly,  
10 they would use that. That's the kind of stuff  
11 we expect the health physicist to pull out of  
12 these documents.

13 **MR. BELL:** Right.

14 **MS. ROBERTSON-DEMERS:** But you don't have a  
15 flow chart that you give them, just like a one-  
16 page flow chart on how to walk through the  
17 Mallinckrodt dose reconstruction process?

18 **DR. NETON:** No. No, we actually have discussed  
19 ORAU developing -- I believe they are in the  
20 process of developing user guides to the  
21 profiles. It's been our experience that the  
22 profiles are fairly lengthy documents and  
23 difficult to extract the relevant information  
24 if you're trying to do a dose reconstruction,  
25 so we were -- we've asked ORAU to go back and,

1           where appropriate, develop user guides that  
2           would essentially be fairly succinct summaries  
3           of all the information -- there's a lot of the  
4           information in the profile that one doesn't  
5           necessarily need to know to do a dose  
6           reconstruction -- or many of them, anyway.

7           **MS. WESTBROOK:** This is Janet. Because the  
8           mandate wasn't clear in Rev. 0, you know, in  
9           that time frame for all the TBDs, it was  
10          thought that we should have a little bit more  
11          like a recipe book in the TBD. But it was  
12          supposed to be pretty general because of these  
13          other ORAU OTIBs, things that would specify how  
14          a dose reconstructor was generally supposed to  
15          proceed in case of external dose reconstruction  
16          and so forth. And so the instructions in the  
17          TBD then were to be project-specific. And so  
18          in Rev. 1 I think if you were to compare the  
19          old and the new you would find that Rev. 1 has  
20          much more simplified, much more step one, step  
21          two, step three for externals, separate steps  
22          for the post-operations era and so forth. I  
23          think you'll find it's a little bit easier to  
24          follow if you were to see Rev. 1, which you  
25          haven't. But anyway, that is an improvement

1           that we made on that to address that problem.  
2           **DR. NETON:** Okay. And then there was just one  
3           other issue that I -- that's a sort of global  
4           issue I'd just like to raise. When ORAU (sic)  
5           is doing a review of the adequacy of the data,  
6           I guess I'd like to discuss a little bit of  
7           what approach you've taken to doing that.  
8           Because in my opinion, in certain sections of  
9           the document it appears that you're almost  
10          doing an SEC petition evaluation, and I'm not  
11          sure that was the intent of the task order, at  
12          least. In other words, there are statements in  
13          there that the data are not adequate to support  
14          dose reconstruction. It was my opinion -- and  
15          certainly the Board is here, can correct me if  
16          I'm wrong -- the adequacy of the data really  
17          spoke to the fact that did NIOSH pull all the  
18          strings for the dataset, are there additional  
19          sources that should be considered, that sort of  
20          thing. So I'm not clear. I'd just -- I'd like  
21          to sort of differentiate between an SEC  
22          petition evaluation, which is what it sort of  
23          sounds like in certain sections, versus the  
24          adequacy of the data to do -- or are there data  
25          missing that we need to put in there to do a

1 better job.

2 **MR. BELL:** Well, one of our objectives is to  
3 deal with adequacy of data. And obviously we -  
4 - we try to do the best evaluation we can of  
5 what you've used. I think we don't always see  
6 all that you have, and that's why I think these  
7 kind of dialogues are important because it  
8 gives a better feel for what you're using, and  
9 I think that'll help a little bit. But in  
10 terms of what we had to work with in Rev. 0,  
11 there just seemed to be some areas where we  
12 thought the data could be better, particularly  
13 in the early period.

14 **MR. FITZGERALD:** I guess more globally, go back  
15 to our original procedures, because I think  
16 that frames up both the objectives as well as  
17 sort of what's in those objectives, and then  
18 goes further to sort of lay out the kinds of  
19 questions that we would use to probe the  
20 adequacy of data. And we try to -- like I  
21 said, we try to keep to that approach because I  
22 think -- I understand -- certainly what you're  
23 saying is that -- that frames up what adequacy  
24 is in our view, and -- and to be consistent  
25 from site to site, we're trying to stay within

1           those bounds. That's kind of our charter that  
2           we went into.

3           Now if that scope is proven some kind of  
4           troublesome, certainly we can pick it up with  
5           the Board and the Board is...

6           **DR. NETON:** I looked at the procedure, of  
7           course, that you guys put together, and it  
8           talks about a review of completeness and  
9           adequacy of information sources --

10          **MR. FITZGERALD:** Right.

11          **DR. NETON:** -- and determine if the NIOSH  
12          contractor appropriately identified, evaluated  
13          and incorporated all relevant data sources by  
14          comparing, to the extent that such is present.

15          **MR. FITZGERALD:** Right.

16          **DR. NETON:** That's a slightly different focus  
17          than saying that this is not sufficient for  
18          dose reconstruction. I think an appropriate  
19          comment may be that there is not -- NIOSH does  
20          not -- has not sufficiently polled all the  
21          sources or something.

22          **MR. FITZGERALD:** All right.

23          **DR. NETON:** There's always a level where one  
24          can back-drop to.

25          **MR. FITZGERALD:** Okay.

1           **DR. NETON:** If ORAU (sic) were to say that the  
2           distribution did not appear to be adequately  
3           fleshed out, that's different than saying you  
4           can't do a dose reconstruction, because one  
5           could always then go back and say well, is the  
6           source term information sufficient to do a dose  
7           reconstruction. And that -- and I'm not sure  
8           that that was the intent for the review to do  
9           that.

10          **MR. FITZGERALD:** Okay. Well, we certainly can  
11          accept that comment and go back and make sure  
12          it's consistent with the procedures and -- no,  
13          we certainly don't want to be doing any --

14          **DR. NETON:** Right.

15          **MR. FITZGERALD:** -- quasi-SEC evaluation by  
16          virtue of that objective. So we'll certainly  
17          go back and make sure that -- that that wording  
18          is clear, that we're doing the adequacy of the  
19          data, the adequacy of the records and the  
20          information itself.

21          **DR. NETON:** I just wanted to --

22          **MR. FITZGERALD:** All right.

23          **DR. NETON:** -- make sure that we're on the same  
24          --

25          **MR. FITZGERALD:** We'll certainly be looking at

1           that.

2           **MR. FLEMING:** Can I add one thing? I just --  
3           this is Kenny Fleming. Some of the comments  
4           just seem to indicate more of not doing a dose  
5           reconstruction but actually doing -- doing a  
6           dose assessment, and there seem to be two --  
7           two different definitions of both the dose  
8           assessment having actual data and being able to  
9           do that. When the data is there I'm sure the  
10          DRs use that data that's available to -- to do  
11          a dose assessment effectively for a dose  
12          reconstruction. But when the data is not  
13          individualized, then you fall back on whatever  
14          data is necessary to do a dose reconstruction  
15          rather than a dose assessment based upon models  
16          that have been -- have been conducted for  
17          internal exposures as well as possibly some  
18          external exposures, also. So I think that that  
19          was -- seemed to be some of the flavor of the  
20          comments that I saw, too, in the SCA comments.  
21          It almost seemed like y'all were wanting a lot  
22          of data for individual dose assessments rather  
23          than just for dose reconstruction. It seemed  
24          like that was something I caught out of that.

25          **MS. MUNN:** This is Wanda. I share some of

1 Jim's concerns, just from the tone of some of  
2 the comments that I read. I was a little  
3 concerned that the tone might predispose the  
4 average reader to some assumptions that, in my  
5 view, we're not quite yet able to make. And I  
6 think I would -- I think we do need to be very  
7 sensitive to the fact that language that  
8 appears in these official documents can easily  
9 be misinterpreted by people who -- who have  
10 some other agenda other than identifying where  
11 we are with these things.

12 **MR. FITZGERALD:** Well, let me just say we -- we  
13 agree that, you know, we'll make -- you know,  
14 go back and make sure that the -- the language  
15 and tone is consistent with certainly our  
16 charter, and we don't want to suggest anything  
17 that would be other than that. So we'll go  
18 back and make sure that the document reflects  
19 that.

20 **MS. MUNN:** Thank you.

21 **MS. ROBERTSON-DEMERS:** This is Kathy. I've got  
22 a question. With respect to the dose  
23 reconstructions for Mallinckrodt, how many  
24 individuals have followed the standard process  
25 outlined in the TBD versus individuals that

1           you've pulled out and looked at on an  
2           independent basis?

3           **DR. NETON:** I'm not sure what you mean by that.

4           **MS. ROBERTSON-DEMERS:** Well, you've done what,  
5           47 cases?

6           **DR. NETON:** Forty-something cases, right.  
7           Those 40-something cases, all but one have been  
8           compensable, so I suspect that they've all used  
9           the information in the profile which, as Tom  
10          alluded to, is more than likely they're going  
11          to be a lung or a skin dose calculation to put  
12          a minimum dose on the intakes for the lung  
13          cases and some extremity or skin dose from the  
14          external exposure. So the data would have come  
15          from the profile. It wouldn't have been one of  
16          these other (inaudible)-wide maximizing  
17          approaches or something like that, you're  
18          right.

19          **MR. RUTHERFORD:** I will add to -- this is LaVon  
20          Rutherford -- we have done some that we have  
21          actually used external exposure data beyond --  
22          and not lung, but in the early '40 -- the early  
23          '42 to '46 time frame that were comp cases  
24          only, and it was basically where we were able  
25          to use the external exposure matrix that's set

1 up in the TBD and recognize that with this  
2 cancer that it was clearly going to be a  
3 compensation case. So we -- it's not -- I mean  
4 for the most part, it is lung cancers, but  
5 there were other ones -- a few other ones that  
6 we were able to complete from a compensation  
7 just --

8 **DR. NETON:** I can recall there was at least one  
9 case where you could just add up the external  
10 dose of record.

11 **MR. RUTHERFORD:** Yes, yes.

12 **DR. NETON:** No missed dose or anything to that  
13 effect. It's clearly over 50 percent, so...

14 **MR. BELL:** Are your --

15 **MS. ROBERTSON-DEMERS:** Go ahead.

16 **MR. BELL:** I was going to say, are your records  
17 such that you have weekly or annual doses where  
18 you could add those up fairly easily?

19 **DR. NETON:** Yeah.

20 **MR. BELL:** I found some copies on the --

21 **MR. RUTHERFORD:** Where we have --

22 **MR. BELL:** -- ORAU database.

23 **MR. RUTHERFORD:** -- the '48 -- actually '46 on  
24 an external -- we have good data, '48 -- I mean  
25 excellent data that are clearly -- can, you

1 know -- you can use that. And I -- if I  
2 remember correctly, we actually have a couple  
3 of the '48 and later cases, comp cases that we  
4 did, we actually used the -- I mean just the  
5 urinalysis data without even using the TBD that  
6 was easily -- easily done.

7 **DR. NETON:** Right. I mean the TBD would be  
8 there to -- if there were detection --

9 **MR. RUTHERFORD:** Right.

10 **DR. NETON:** -- limit issues --

11 **MR. RUTHERFORD:** Right.

12 **DR. NETON:** -- and that sort of thing.

13 **MR. RUTHERFORD:** Right.

14 **DR. NETON:** But if a person's urinalysis data  
15 appeared to be valid, it was not, you know,  
16 some contamination incident or something, then  
17 no reason to use it. And for the most part,  
18 with insoluble actinides, a couple of positive  
19 urinalysis samples is sufficient to put it over  
20 50 percent almost automatically.

21 **MS. ROBERTSON-DEMERS:** Okay. In relation to  
22 the cases that are non-compensable -- and I  
23 know you've only done one --

24 **DR. NETON:** Right.

25 **MS. ROBERTSON-DEMERS:** -- at what point do you

1 pull an individual out and say the TBD does not  
2 fit this individual?

3 **DR. NETON:** Well -- but I think in this case  
4 the non-compensable -- I haven't looked at it  
5 in detail, but I suspect what it was was the  
6 individual had exposure in a time frame when we  
7 felt we had sufficient documentation. It may  
8 have been a very short duration employment  
9 history, I'm not sure, but something to that  
10 effect where it's a non-radiogenic cancer with  
11 a short employment duration, maybe monitored  
12 for a year, and one could -- and non-metabolic,  
13 so you can put those factors together and one  
14 can be very generous in maximizing and  
15 demonstrate that exposure -- and the job  
16 category, of course, comes into play, what was  
17 the person's job.

18 **MS. ROBERTSON-DEMERS:** I guess I need to back  
19 up and ask that question more generally. At  
20 what -- what's the process for looking at the  
21 TBD with respect to an individual and saying  
22 this approach fits this individual, or this  
23 approach does not fit this individual?

24 **DR. NETON:** Well, but there's -- there's no  
25 approach in the TBD. That's what I've been

1           saying is that the TBD documents the facts of  
2           the exposure conditions under which a person  
3           worked or under which many people worked.  If  
4           you're asking how does a certain job category  
5           become defined as to whether that fits, that's  
6           -- that's a composition of looking at the  
7           interview and looking at the person's job title  
8           itself, looking at -- there's other procedures  
9           that help guide one in determining which jobs  
10          are potentially more -- have a higher potential  
11          for exposure than other job categories.  It's  
12          really more of a composite.

13         **MR. RUTHERFORD:**  And I -- this is LaVon  
14         Rutherford again.  I may add to that, as a dose  
15         reconstructor, how I -- and it's exactly what  
16         Jim said, but you know, basically what you're  
17         going to do is what -- what data do I have  
18         available.  Okay?  And this goes for all cases,  
19         not only Mallinckrodt.  Any case.  Any case  
20         that I do or any of the ORAU team members do is  
21         what -- what data do we have available.  Let's  
22         look into his record.  Let's see what  
23         urinalysis data he has.  Let's see what  
24         external dosimetry data the individual has.  
25         Where did they work, what time frame did they

1 work, review the CATI information and any  
2 incidents identified in there in the CATI. You  
3 go through that whole process, then you go into  
4 -- you know, you'll look at your TBD, look for  
5 limitations in data identified in the TBD. You  
6 look for all of those things, and -- and you  
7 will -- from the review of that information,  
8 you develop different approaches with that  
9 data.

10 Obviously, you know, looking at a cancer, I've  
11 got, you know, a lung cancer, you know, which  
12 we've said many times, and I have positive  
13 urinalysis data. Okay, your first thing as a  
14 dose reconstructor -- well, this is probably  
15 going to be a compensation case, you know, so  
16 I'll go that route first to see if I can do an  
17 underestimate for it and see if it bounces over  
18 to 50 percent, you know. And for non-metabolic  
19 cases and if I had dosimetry data and the data  
20 looks good and it looks like they have low  
21 exposure, I may go immediately to an  
22 overestimate, you know. And you'll bounce in  
23 those different approaches, and obviously you  
24 have to ensure that whichever way you're going  
25 is the correct way, in the manner that --

1 meaning that I'm not taking anything away from  
2 the claimant when it's supposed to happen, you  
3 know. Or -- or I'm not going to do an  
4 underestimate or a -- a underes-- or an  
5 underestimate for a less than 50 percent, you  
6 know, something like that. You understand?  
7 So I think it's -- a lot of it is -- is the  
8 dose reconstructor. You know, it's the  
9 process. Evaluate the data you have available,  
10 determine your approach from that data. And  
11 it's not one set way. It's -- you've got to  
12 determine what's right and ensure that you're  
13 going to fall on the right side of that line.  
14 **DR. NETON:** You could actually have two dose  
15 reconstructors come up with two entirely  
16 different doses and be compensable, and both be  
17 valid. We've had scenarios where a person's  
18 external dose alone would be compensable and a  
19 person -- one or two urine samples alone would  
20 be compensable. It's -- it's entirely valid  
21 for one person to use internal and one person  
22 to use external and demonstrate that -- or at a  
23 minimum, the person's dose is X. No one is  
24 saying that that's even close to his dose of  
25 records, at least that value. So we allow for

1           some latitude here. I think that the number --  
2           the permutations are so large. You know, you  
3           have many workers who were heavily exposed, a  
4           lot of bioassay. You have some workers who  
5           were not so heavily exposed with minimal  
6           bioassay. You have all kinds of combinations,  
7           and it -- as Bomber says, it's up to the health  
8           physicist to pick the best path forward, given  
9           the dataset that he has, and use the profile as  
10          the supplemental guidance -- or as guidance to  
11          filling in any holes or interpretations of the  
12          data, such as what's the proper solubility  
13          class. That's the big one. What solubility  
14          class do I use for this. You know, what was  
15          the monitoring frequency. Did this person work  
16          in an airborne area at all. Do I have evidence  
17          there was a lot of airborne in, you know, plant  
18          two, that kind of thing. So it's a long answer  
19          to a short question. I don't know any other  
20          way to explain it.

21          Any other questions, Kathy, or --

22          **MS. ROBERTSON-DEMERS:** No.

23          **DR. NETON:** Well, then I guess we'll get into  
24          the suggested discussion topics that ORAU --  
25          NIOSH/ORAU have put together.

**DISCUSSION TOPIC 1**

1  
2 The first question has to do with the technical  
3 accuracy section related to available data in  
4 time frames prior to 1947. And I think Bomber  
5 is probably leading the way here, but we want  
6 to talk a little bit more about SC&A and how we  
7 can or cannot use data from '46 and '47 for  
8 dose reconstructions.

9 **MR. RUTHERFORD:** Okay. I think generally most  
10 of us agree -- most of us, I have to say most  
11 of us -- agree that the '42 to '45 time period  
12 the plant one and plant two operations -- we  
13 have minimal data. We have -- we have a small  
14 amount of data. We have -- we do have some --  
15 some air sample data. We do have some external  
16 monitoring data, spotty, during that '43, '44  
17 time period. We have very little radon data  
18 during that time period. So -- so there is --  
19 you know, there is definitely questions on the  
20 amount of data that we have available, '42 to  
21 '45 time period.

22 I really wanted to focus more on the '46 to '48  
23 time period. And I think the one question that  
24 comes up in the report is -- is if you look at  
25 it, I think there's three or four different

1 places where we identify limitations in data  
2 and we use different date-- one -- one place  
3 will use pre-194-- or will say '47 --

4 **DR. NETON:** By "we" you mean ORAU -- the SC&A  
5 report.

6 **MR. RUTHERFORD:** Yeah, the SC&A report, I  
7 apologize, uses different limitations and  
8 dates. In one period it'll say '47 -- before  
9 '47. Another spot -- I've seen '48, and then  
10 another spot '49. So you know, there -- I  
11 don't know -- and there may be some  
12 inconsistency issues in that date, but let's  
13 focus on the data available.

14 **MR. BELL:** Can I -- can I explain a little bit  
15 some of that before we get into --

16 **MR. RUTHERFORD:** Sure.

17 **MR. BELL:** Our dilemma was that if you look at  
18 film badge data, it didn't start till about  
19 December, '45, so you have --

20 **MR. RUTHERFORD:** Right.

21 **MR. BELL:** -- you actually have a hole back  
22 before then. Okay?

23 **MR. RUTHERFORD:** Right.

24 **MR. BELL:** If you're talking about dust data  
25 studies, they didn't really get underway until

1                   probably '48, in a big way. Okay? It's hard  
2                   for us to talk about that period without -- in  
3                   some cases I did say film badge below --

4                   **MR. RUTHERFORD:** Right, and you did, yeah.

5                   **MR. BELL:** But when I was talking about the  
6                   '47, '48, I was really talking about the whole  
7                   plethora of urinalysis data, better dust study  
8                   data --

9                   **MR. RUTHERFORD:** Right.

10                  **MR. BELL:** -- and how to handle that period  
11                  because in some cases we said we just don't  
12                  have much data from this whole period, which is  
13                  then '42 to '47, '48. In other cases, if  
14                  you're more specific, then it has to do with  
15                  whether you have urinalysis data or whether you  
16                  have film badge data or whether you have dust  
17                  concentration data.

18                  So if there's a little inconsistency, it's  
19                  'cause we're trying to struggle with which  
20                  pieces have data in those various periods.

21                  **MR. RUTHERFORD:** Okay.

22                  **MS. ROBERTSON-DEMERS:** Can I make a request?

23                  **MR. BELL:** Sure.

24                  **MS. ROBERTSON-DEMERS:** When you respond to us,  
25                  it would be very helpful if you can list the

1 additional records that you've come across that  
2 are not in the database or on the O drive.

3 **MR. BELL:** You mean that they're using for this  
4 period?

5 **MS. ROBERTSON-DEMERS:** That they're going to be  
6 using for -- I guess in Rev. 1.

7 **DR. NETON:** I'm sure we can capture that at  
8 ORAU. And again, I think this -- this speaks  
9 to the issue of SC&A possibly trying to make a  
10 decision whether dose reconstructions can be  
11 done or not. I would -- I would submit that  
12 the data are the data. And if those are the  
13 data we included in the profile, I'm not sure  
14 that there's a value judgment to be made  
15 whether we can do dose reconstructions with  
16 that data. In fact it may be that we don't,  
17 and we say well, then there are other  
18 approaches that are more appropriate, such as  
19 going backwards in time and do some backwards  
20 extrapolation to a point where we know the  
21 processes were the same. So we have data '49,  
22 '50 and we can do some backwards extrapolation  
23 and -- and inflate it for some confidence level  
24 that we know -- we'll have a confidence level  
25 that were a little bit higher.

1           **MR. BELL:** Can I interject then on that point?  
2           I didn't see in the TBD a discussion of using  
3           back calculation, and I think I brought it out  
4           in a report that I was concerned that there --  
5           there was urinalysis data that could be used  
6           maybe to help improve our knowledge of the  
7           early period, and it wasn't discussed and  
8           perhaps it will be in Rev. 1, but I think it's  
9           a significant point.

10          **DR. NETON:** I think it's a valid -- valid  
11          point.

12          **MR. GRIFFON:** Jim, is that -- I -- I agree with  
13          that, and the scope question you and Joe  
14          discussed earlier. I agree with that as far as  
15          the site profile goes. Is there -- and it is  
16          more of an SEC petition question than whether  
17          there's suffic-- you know, sufficient  
18          information to do a dose -- to determine a  
19          dose. Is there a proactive mechanism that  
20          NIOSH and ORAU are using so that in your  
21          development of these prof-- of site profiles,  
22          as you're looking at the groups of workers  
23          working at these sites, are you trying to self-  
24          identify whether there are certain groups that  
25          fall into that that we can't reconstruct?

1           **DR. NETON:** I'm not sure I can comment on that  
2           at this time. We are actively in the process  
3           of the SEC petition evaluation for Mallinckrodt  
4           and I really -- that's premature --

5           **MR. GRIFFON:** Not from a -- okay.

6           **DR. NETON:** -- to comment on where we are with  
7           that. But I guess, as I mentioned, the data  
8           are the data, so that the health physicist has  
9           this. It doesn't mean that NIOSH is going to  
10          do dose reconstructions using two or three  
11          datapoints. It just -- that's what the health  
12          physicist has available.

13          I think the issue where we -- where we differ,  
14          and I can sense this from Kathy's questions,  
15          where are the exact procedures that say you  
16          have two datapoints, do it this way. And  
17          that's not really the intent of the profile.  
18          The profile is to say what do we have. And to  
19          that extent, it is a summary of the available  
20          information that we could find. If SC&A feels  
21          that there's additional information we haven't  
22          found or need to put in there, I think that's  
23          more relevant. The proof of whether or not the  
24          dose reconstructor used the site profile  
25          appropriately is in the review of the dose

1 reconstruction.

2 I feel like I'm a broken record to an extent,  
3 but I've been saying this since day one and I  
4 still believe it, that you take the profile --  
5 and NIOSH does review every single dose  
6 reconstruction -- and if our health physicist  
7 looks at it and says this person used these  
8 datapoints back here to definitively deny --  
9 well, we don't deny people, but definitively  
10 determine it's less than 50 and it's  
11 inappropriate, we'll send it back. So I guess  
12 a valid point is that maybe that needs to be  
13 there, more guidance, I don't know. That was  
14 not our intent.

15 **MR. FITZGERALD:** Yeah, and just based on last  
16 week's review on the dose reconstructions, we  
17 sort of got into the same issue, but backwards  
18 in the sense that for the individual dose  
19 reconstructions that dealt with, for example,  
20 Savannah River and Hanford, I guess the  
21 deliberation on how the issues were applied in  
22 those individual DRs were deferred to the site  
23 profile review itself rather than trying to  
24 deal with those generic issues in that forum or  
25 in that context. So it's probably not as neat

1 as one would like because the generic issues  
2 are ones that the site profile influences in  
3 terms of how they're -- how that's addressed in  
4 the individual DRs. So in a way that'll have  
5 to be a judgment.

6 I think, one, we agree that no, we can't be  
7 talking about sufficiency of data or adequacy  
8 of data in the context that confuses and  
9 overlaps an SEC evaluation. We're looking, as  
10 you have phrased it very clearly, looking at  
11 the adequacy of information that's presented as  
12 what information's out there, not a judgment  
13 call so much on how that should be applied.  
14 However, it's -- we get into the application  
15 issue in the context of your first point or  
16 earlier. It's difficult not to address the  
17 context of how that information would be used.  
18 So we're always going to be juggling, but we  
19 have to avoid -- I think this is the bottom  
20 line. We have to avoid either tone or  
21 terminology that suggests we're looking in toto  
22 at a judgment on whether or not the overall  
23 information's adequate for dose reconstruction.  
24 That we have to stay clear from.

25 **MR. BELL:** Jim, I might -- I might add here

1           that I think Kathy's problem would be solved  
2           somewhat if we had a sample dose reconstruction  
3           for Mallinckrodt where you actually did the --  
4           worked it through and we saw the process you  
5           went through. We don't know that at this  
6           point. I haven't seen it. And you haven't  
7           really developed that, either, yourself. But  
8           when we get to the point where we've seen that,  
9           then we'll understand better how you're  
10          applying that technology and that methodology,  
11          and I think that'll help solve some of the  
12          dilemma there. But obviously it's going to  
13          come later.

14         **DR. NETON:** I totally agree. The way the task  
15         orders were written, it's sort of -- does not -  
16         -

17         **MR. FITZGERALD:** Yeah, again, the context of --  
18         of having knowledge and the application just to  
19         have context on the information is one thing,  
20         as long as we, again, avoid the other issue,  
21         the third rail, which is trying to look at in  
22         toto a judgment on the adequacy of information.  
23         So I think the applications part of it is what  
24         you're referring to, which is I think fine.  
25         It's in balance and we should be looking at

1           that, and we did in fact back into it from last  
2           week's dose reconstruction review, but yet we  
3           have to go back and look at how that's applied  
4           in the generic sense. But the other issue I  
5           think we clearly have to avoid.

6           **DR. NETON:** I think, you know, a lot of that  
7           falls into the procedures review, which was  
8           another task order.

9           **MR. RUTHERFORD:** Right.

10          **DR. NETON:** You know, having been the person  
11          who conceived of the profiles, they seem to  
12          have taken on a much, much larger life of their  
13          own than when I envisioned what they were going  
14          to do. You know, I just envisioned 100 people  
15          doing dose reconstructions and boy, I'd like to  
16          have them have the same set of information in  
17          front of them to do that. That was -- that was  
18          the extent that the -- now whether that concept  
19          is valid in light of the procedures and how we  
20          do our business, that's certainly valid for  
21          criticism. Everything's valid for criticism,  
22          but I'm just trying to point out, you know,  
23          where we were coming from, that's all.  
24          Okay, Bomber, were you finished with that or  
25          did we want to -- we were talking about the

1 1946 and '47 --

2 **MR. RUTHERFORD:** Yeah, I'm sure that the -- the  
3 '46, '47 -- you know, we feel that we -- we do  
4 have sufficient information for '46 to '47  
5 period where we do have limited air dust data.  
6 And our approach is -- our reasoning for that  
7 is plant four and plant six came on line in  
8 194-- the end -- very beginning of 1946.

9 Actually there's a little data that we have  
10 that it's end of 1945, first of 1946 that we  
11 have some air dust data from that period, a  
12 small number, that we retrieved last week --

13 **MR. BELL:** But those aren't full dust studies,  
14 though. Right? Those are just --

15 **MR. RUTHERFORD:** No --

16 **MR. BELL:** -- samplings?

17 **MR. RUTHERFORD:** Yeah, those are samples.  
18 Those are samples that were ta--

19 **MR. BELL:** Microgram per cubic meter or into  
20 the dust -- actual gram per cubic meter?

21 **MR. RUTHERFORD:** They're in gram per cubic  
22 meter.

23 **MR. BELL:** Okay.

24 **MR. RUTHERFORD:** And actually microgram per  
25 cubic meter, excuse me. And the -- we do have

1           -- actually have air dust data from the very  
2 beginning of 1948 prior to administrative and  
3 engineering control being implemented later on.  
4 We have a January -- detailed January dust  
5 study that was -- that was from 19-- for plant  
6 six and I believe, if I'm correct, Tim and  
7 Kenny, didn't we retrieve one for plant four,  
8 as well?

9           **MR. FLEMING:** Yeah.

10          **MR. RUTHERFORD:** Which actually have detailed -  
11 - or actually have drawings of the areas, dust  
12 samples taken in the areas, and then there --  
13 we have a follow-on -- after some  
14 administrative controls were implemented, we  
15 have a follow-on air dust data for later that  
16 year, and then we also have the air dust data  
17 after the engineering controls --

18          **MR. BELL:** Is that the one that --

19          **MR. RUTHERFORD:** -- were implemented.

20          **MR. BELL:** -- does the comparison between early  
21 and later?

22          **MR. RUTHERFORD:** There's a discussion, yeah.  
23 Yeah, there's a discussion.

24          **MR. BELL:** I may have seen that one. I can --

25          **MR. RUTHERFORD:** Okay.

1           **MR. BELL:** And that's on that -- that's on the  
2           O drive. Right?

3           **MR. RUTHERFORD:** Correct. But I think that the  
4           issue is is that we have -- the plant was  
5           operating fairly consistently '46 to '48 time  
6           period, and the -- we have -- we have some --  
7           we have data available for that time period.  
8           We have later data available that I agree is  
9           after engineering controls were implemented.  
10          We also have radon dust -- radon -- radon data  
11          from the '46 time period on -- and again, I'm  
12          leaving back '42 to '45. Okay? I'm just  
13          focusing on the '46 and on.

14          **MR. BELL:** Right. Okay. I assumed that's what  
15          you meant.

16          **MR. RUTHERFORD:** Okay. And we also have film  
17          badge data and dose rate surveys that -- for  
18          that time period. So I -- you know, using a --  
19          and, as you had mentioned in the report, we had  
20          urinalysis data as well in '48 on. And I think  
21          using the data that we have available, as well  
22          as earlier reports -- you know, we do have the  
23          -- obviously the '42 to '49 study that was done  
24          for plant four and plant six which used a lot  
25          of time motion studies and that we can make

1           some comparisons to, as well, that it's clear  
2           that we can come up with pretty good exposure  
3           matrix for '46 and '47.

4           **MR. BELL:** The '42 to '49 studies are in what  
5           format?

6           **MR. RUTHERFORD:** The '42 to '49 study -- it's  
7           in a hard report that's a PDF file on the --  
8           and has it been put on the O drive?

9           **UNIDENTIFIED:** It's on there, yeah.

10          **MR. RUTHERFORD:** 'Cause we actually have most  
11          of that report now.

12          **MR. BELL:** It might be helpful if you can point  
13          me to that one.

14          **MR. RUTHERFORD:** Sure.

15          **MR. BELL:** I might find that one interesting.  
16          Maybe I've seen it, but it doesn't sound -- I  
17          don't remember that big a time frame.

18          **MR. RUTHERFORD:** Well, they identify -- the  
19          funny thing about it is -- and believe me, when  
20          I first was working on this issue I was like  
21          wow, '42 to '49, great. Let's see what it  
22          looks like. But if you actually look at it,  
23          it's '42 to '49, plant four and plant six  
24          workers, which -- you know --

25          **MS. WESTBROOK:** Are you referring -- this is

1 Janet. Are you referring to the AEC and  
2 Mallinckrodt attempt to reconstruct --

3 **MR. RUTHERFORD:** Reconstruct, right.

4 **MS. WESTBROOK:** -- in 1949 their -- and  
5 supposedly they each kind of did it separately,  
6 based on the data --

7 **MR. BELL:** I've seen that, and we actually  
8 commented on the chart that shows that  
9 comparison.

10 **MS. WESTBROOK:** Okay, so that --

11 **MR. BELL:** So that's the data we're talking  
12 about.

13 **MR. RUTHERFORD:** That's the data.

14 **MR. BELL:** Okay. Then we've seen it, never  
15 mind.

16 **MR. RUTHERFORD:** So I think what -- and my  
17 point I'm really getting at is I don't know if  
18 we need to clarify in the SC&A report -- mainly  
19 clarify, you know -- okay, the limitations of  
20 the data or clarify the time periods, or -- or  
21 how to -- really to address it, you know.

22 **MR. BELL:** Okay, so you're basically saying  
23 that in the '46 to '40 (sic) there's enough  
24 data to probably do an adequate job if you did  
25 a dose reconstruction.

1           **MR. RUTHERFORD:** Uh-huh.

2           **MR. BELL:** And it's really before '46 that's  
3 the big problem.

4           **MR. RUTHERFORD:** Correct.

5           **MS. ROBERTSON-DEMERS:** This is Kathy. Earlier  
6 today Jim mentioned looking at the pedigree of  
7 the data. What does that process involve?

8           **DR. NETON:** Pedigree of the air sample data or  
9 the urinalysis?

10          **MS. ROBERTSON-DEMERS:** Any -- any data.

11          **DR. NETON:** I don't know if ORAU -- ORAU wants  
12 to speak to this or not, but we look at the  
13 data in light of the procedures that may have  
14 been employed, if we can find them; you know,  
15 the chemical monitoring techniques,  
16 particularly for urinalysis. There are only so  
17 many -- so many types of dosimeters and urine  
18 sample techniques that were used in the early  
19 days, and even up until current times, in the  
20 AEC. So for example, if the urine samples --  
21 were they fluorometric technique or not, so  
22 looking -- looking at the chemistry that was  
23 used, the type of dosimeters, the  
24 characteristics of those dosimeters, I think we  
25 have a fairly good handle on those historically

1 old DOE operations at this point.  
2 There's been some questioning about the air  
3 sampling programs and their adequacy. I think  
4 that was raised in this profile, as well. We  
5 are currently, as part of the Bethlehem Steel  
6 profile review, putting together our  
7 interpretation of the adequacy of generic air  
8 sampling programs for early AEC operations.  
9 Could we have done a better job documenting  
10 that? I think the answer is yes, for sure.  
11 But you know, the data tend to be somewhat  
12 spotty and sort of interconnected. And if you  
13 look at, for instance, early Fernald  
14 operations, 1952, '53, those are essentially  
15 similar processes for air sampling that were  
16 performed at Mallinckrodt, AEC, I mean they  
17 were all under the control of AEC operations --  
18 New York operations office under Merrill  
19 Eisenbud, so they did very similar things. So  
20 we've found documents, for instance, for early  
21 air sampling where the breathing zone sample  
22 really meant you stuck the air sampler right  
23 over the guy's shoulder and held it there  
24 during the operation, a puff or whatever.  
25 These tend to be -- you know, in the Bethlehem

1 Steel case, puffs of stuff. Things were run  
2 through a process and you would just stand  
3 there for a minute or two that it was -- it was  
4 there, as opposed to what they would call a  
5 process sample, which would be a sample that  
6 would be not necessarily anyone in the area,  
7 but just measure what happened right as close  
8 to that process as possible, even though it  
9 might not be used in a time-weighted average  
10 calculation for a worker versus a general area  
11 sample. So we believe that in those early air  
12 samples we have a fairly good knowledge of what  
13 occurred. We just need to document it a little  
14 better.

15 **MS. ROBERTSON-DEMERS:** This is Kathy. So the  
16 breathing zone air samples were within a meter  
17 of the person's --

18 **DR. NETON:** Actually we believe --

19 **MS. ROBERTSON-DEMERS:** -- breathing zone or  
20 what?

21 **DR. NETON:** -- that they -- they were actually  
22 right over their shoulder -- near their  
23 shoulder.

24 **MS. ROBERTSON-DEMERS:** Okay.

25 **DR. NETON:** We're documenting this. We haven't

1 finished this report. I'm supposed to get a  
2 copy of this report tomorrow, but we've  
3 researched this to the best extent we can.

4 **MR. BELL:** I noticed in the dust study reports  
5 that there are a lot of general samples, as  
6 well. So I mean there's a kind of a confusion  
7 as to whether they really are, you know, a  
8 breathing zone sample or whether they're not,  
9 so --

10 **DR. NETON:** Well, one has to -- one has to look  
11 at this in the context of what they did. I  
12 mean they -- early AEC operations were very big  
13 on time-weighted average exposures. And to do  
14 a time-weighted average exposure, one needs to  
15 rely not just on process or breathing zone, but  
16 also general area because the worker may move  
17 around in the work place -- and I'm sure you're  
18 aware of this, but --

19 **MR. BELL:** Sure.

20 **DR. NETON:** So you know, based on some of the  
21 analyses I've seen, the time-weighted exposure  
22 analyses, they did a pretty good job, it  
23 appeared, to -- to do that. So they would put  
24 general area samplers, for instance, at 15 feet  
25 from the process, 30 feet, above the machine,

1 near the machine, near the person's shoulder  
2 for a breathing zone -- and we're still trying  
3 to flesh this out, but we believe these P  
4 samples were like process samples. They were  
5 just put there just to monitor the process in  
6 general, much like as if you had a lathe going,  
7 you would just put something there and let it  
8 run. We will -- we will flesh that out in more  
9 detail, but it -- particularly for the  
10 Bethlehem Steel response, but it's also of  
11 course applicable to the Mallinckrodt, as well  
12 as a number of other early AEC operations.

13 **MS. WESTBROOK:** This is Janet adding something,  
14 which was that once in a great while they would  
15 note down if they couldn't get close enough for  
16 the breathing sample. They would say oh,  
17 because of the limitations of the whatever, we  
18 had to -- this sample was taken further away,  
19 so that tends to underscore their -- that their  
20 usual practice was in fact to take up a --  
21 close up, what we would term a true breathing  
22 zone sample and not say a meter away, even.

23 **MS. ROBERTSON-DEMERS:** In relation to the  
24 pedigree of the data, how did you take into  
25 account like administrative issues, like just

1 recording zeroes for people who may not have  
2 been monitored at all, or recording zeroes when  
3 badge was lost or that type of thing?

4 **DR. NETON:** Are you talking about the  
5 Mallinckrodt profile now or is this a generic  
6 question related to the program?

7 **MS. ROBERTSON-DEMERS:** Well, it pertains to  
8 Mallinckrodt.

9 **MR. SCALSKY:** These -- this is Ed Scalsky.  
10 These are all taken into consideration. If  
11 there's, you know, missed data, if they don't -  
12 - if the badge recorded zero -- I mean all the  
13 aspects that you just mentioned are taken into  
14 consideration, and in general they're  
15 delineated in the site profile -- not  
16 necessarily in Mallinckrodt, but they certainly  
17 are in the others.

18 **MR. RUTHERFORD:** This is LaVon Rutherford. I  
19 would add to that, it also comes back to the  
20 dose reconstructor again, in that when you're  
21 doing a dose reconstruction, clearly when  
22 you're looking in an individual that -- you  
23 know, and I can think of a perfect example of  
24 what -- one I reviewed from a -- I can't  
25 remember what -- which site it was for sure,

1 but it -- they had a period of from 1948 to  
2 1953 where the individ-- or no, 1952 to '56  
3 where the individual had beautiful external  
4 monitoring data, low doses. And then '56 to  
5 '60 there was nothing, and then '61 on there  
6 was -- there was samples. Well, when the dose  
7 reconstructor went to do this, they felt, you  
8 know, okay, that was just environmental from  
9 that '56 to '60 period. But you have to step  
10 back. I mean you have to assume -- you have to  
11 consider could this indi-- could the records  
12 have been lost for that period? Were they  
13 recorded zer-- you know, like you had  
14 mentioned, recorded zero and weren't actually  
15 monitored. And then you have to look at other  
16 approaches for that data. Okay, do I -- I --  
17 is it right to say that this person was only  
18 exposed to ambient? Well, if I can't prove  
19 that -- if I cannot come up with a good proof  
20 or can't justify it, then I can't -- I have to  
21 say no and I have to go over with a more  
22 claimant favorable approach, which may be using  
23 his highest exposure for a given period and  
24 setting it up for that period -- for -- over  
25 that whole period. So I think it comes back --

1           it's not really so much always the site profile  
2           that's going to address those things. You've  
3           got to address it in your -- when you're doing  
4           your dose reconstruction, you have to be -- you  
5           have to look at all of those things. So -- and  
6           I'm not sure it's always going to be caught in  
7           a dose -- in the site profile, all those little  
8           issues.

9           **MS. WESTBROOK:** This is Janet and I'd like to  
10          add something specific about Mallinckrodt, that  
11          when I did the TBD, the only section that I did  
12          not do was the part about the external dose  
13          reconstruction, what to assume as a default  
14          value and what to assume about missed -- and  
15          the person who did that did that because --  
16          well, on the basis of the limited film badge  
17          data we had. And more and more came on line  
18          where he wasn't able to update it, so then it  
19          came out as the October, 2003 revision that you  
20          all looked at.

21          Now since then we had somebody -- we had a lot  
22          more of the film badge data and the evaluation  
23          of what a zero means has moved to a different  
24          task, so I can't say now what the schedule is,  
25          how that'll be decided. But I will say that

1           what you're seeing there probably was just an  
2           early -- what he believed the first external  
3           dose reconstruction section person wrote based  
4           on the limited data, and now we have a lot more  
5           Mallinckrodt records that speak to the issue of  
6           the film badges and what it all meant. And  
7           also it's very important to see that week after  
8           week and month after month progression because  
9           then from that you can often infer their  
10          protocols, what -- what they meant by certain  
11          things. By a little note at the bottom that  
12          appears one week and not other weeks you can  
13          see perhaps what their usual practice was.

14          **MR. RUTHERFORD:** And I would -- this is LaVon  
15          Rutherford. I would think -- I do think it's a  
16          good idea for the Mallinckrodt site profile to  
17          address the zero readings from the simple --  
18          'cause we do have a report where an individual  
19          from that time period -- and I can't remember  
20          if that was the Mont Mason report or -- that --  
21          that questioned some of the zero readings  
22          identified -- so I think -- I agree, in my  
23          opinion anyway, that we should at least address  
24          that issue that was brought up and -- and our -  
25          - and I believe it was Mont Mason, and I'll

1 have to look at it -- go over it with Jim.

2 **MR. BELL:** Did a little summary earlier.

3 Right?

4 **MR. RUTHERFORD:** Yeah.

5 **MR. GRIFFON:** I guess the other question I  
6 would have with the zeroes, I agree it's  
7 generally going to come up in DRs, but if  
8 you're -- if you've got a surrogate matrix that  
9 you're using and those averages were based in  
10 any way on some data that included zeroes, then  
11 -- then you run into that --

12 **MR. RUTHERFORD:** That is a problem.

13 **MR. GRIFFON:** -- that problem, so --

14 **MR. RUTHERFORD:** Yes, I agree.

15 **MR. GRIFFON:** -- I'm not sure it occurs in  
16 here, but I just thought I'd raise the --

17 **DR. NETON:** That's a very good point.

18 **MR. RUTHERFORD:** Uh-huh.

19 **DR. NETON:** All right. Are we finished with  
20 number one, then?

21 **MR. GRIFFON:** We got quicker last -- we got  
22 quicker last week as we went.

23 **MR. FITZGERALD:** Can we revisit the outcome?  
24 I've lost the train here. What was the  
25 resolution on that?

1           **DR. NETON:** Well, I'm not sure we really had  
2 any resolution other than --

3           **MR. FITZGERALD:** Clarification?

4           **DR. NETON:** -- than the clarification that --

5           **MR. BELL:** I think they're clarifying there's  
6 more data in the '46 and '47 time frame that's  
7 coming to fore that might make that period  
8 better characterized and might make it possible  
9 to do a worst case reconstruction based on that  
10 data. Am I correctly stating that? And that  
11 when we talk about the zone where there's not  
12 as much data, we may want to be discrete on  
13 saying it's '46 back rather than '48 back. Is  
14 that sort of what you're saying?

15           **MR. RUTHERFORD:** Yes.

16                                   **DISCUSSION TOPIC 2**

17           **DR. NETON:** All right. The next discussion  
18 topic has to do with the use of site experts.  
19 SC&A has done an excellent job of going out and  
20 interviewing people in the field, I think --  
21 getting their input. But we'd like to discuss  
22 a little bit about how one defines a site  
23 expert and -- and how -- how best to use this  
24 information in the site profiles. I can just  
25 start briefly and then whoever else -- I didn't

1 write this comment, but I can just share my  
2 quick opinion, is it -- there's often times  
3 that I can speak best from the Mallinckrodt --  
4 I mean the Bethlehem Steel profile review, but  
5 I think it occurs here, as well, where site  
6 experts were interviewed or site workers, for  
7 that matter, who were experts in their job, of  
8 course, made comments about some incidents and  
9 exposure conditions, and they're just related  
10 at face value in the report.

11 It's difficult for us to adopt those. There is  
12 no real follow-up on those. I think that SC&A  
13 would argue or assert that that's our job to go  
14 back and follow those up. But I'd like to talk  
15 a little bit about what happens when we use  
16 distributions, and let's say that, you know, we  
17 have -- we have a tendency to take a  
18 distribution of exposures and then assign a  
19 chronic exposure over a very long period of  
20 time to a worker as a default. I'd like to  
21 explore a little bit the idea of how that situ-  
22 - that assignment of chronic exposure over a  
23 long period of time really sort of overarches  
24 any of these episodic individual little  
25 incidents that may have been reported. Because

1 we find that it's going to be virtually  
2 impossible to address every little incident  
3 that occurred or that was asserted or alleged  
4 by every single worker. That kind of puts us  
5 into a box where we can't move very much,  
6 because any time you do something, then there's  
7 another incident, and let's -- I'd just like to  
8 talk about how, by overarching the exposure  
9 scenario with a continuous chronic for that  
10 exposure situation -- and let's say, for  
11 example, we did use -- I'm not sure this is the  
12 case for Mallinckrodt -- we use the upper 95th  
13 percentile of the distribution, assign it to  
14 all workers, how that really does address some  
15 of these site expert inputs as to -- as these  
16 little incidents that occur. I mean is there  
17 any wiggle room there at all?

18 **MR. FITZGERALD:** Yeah, let me -- let me comment  
19 in a sense that I think that's a reasonable  
20 response. However, when we look at the TBD and  
21 try to find some perspective that envelopes  
22 some of these site expert testimonials in a --  
23 it's not clear how that would be accommodated.  
24 And you know, in our review -- and again, our  
25 review is not going to be a very lengthy and --

1           you know, comprehensive, so when we talk to  
2           people, you know, we're providing input. And  
3           what we're looking for is the extent to which  
4           the site profile accommodates, reflects, can  
5           address, envelope these kinds of concerns. And  
6           you know, we've had this discussion before  
7           about how incidences are addressed, so when we  
8           raise them it's in the context of how does one  
9           accommodate this potential for these kinds of  
10          exposures and does -- is the TBD -- and this is  
11          -- I recognize this is an issue that has been  
12          sort of a generic question all along, but how  
13          does in fact NIOSH address this. And I'm not  
14          saying your response wouldn't be an appropriate  
15          response. I'm just saying that, you know, we  
16          don't really see a clear treatment in the TBD  
17          so, you know, we're trying to marry up what  
18          we're getting from the site expert worker  
19          interviews and what they're having to say about  
20          these historic exposures to how the TBD's  
21          accommodating them. And if it's not clear how  
22          we can link that up, then that's why we're  
23          raising it, in that context, not just to say  
24          here's an issue, here's an issue, here's an  
25          issue, here's an issue.

1           **DR. NETON:** Right.

2           **MR. FITZGERALD:** But just say, you know, what  
3           is the -- what is the approach to addressing  
4           what seems to be some, you know, anecdotal but  
5           yet legitimate historic references.

6           **DR. NETON:** Right. I guess I was hoping that  
7           SC&A would look at some of these distributions  
8           and take a 20-year chronic exposure scenario  
9           and talk about, you know, nanocurie hours or  
10          something of exposure that were assigned, and  
11          then bracket them in the context -- I mean  
12          certainly NIOSH is prepared to do this, as well  
13          -- and bracket them in the context of a one-  
14          hour episode that occurred on an incident out  
15          of 20,000 work hours. And you know, we've  
16          assigned a certain chronic intake and -- and  
17          yeah, that may seem very important to the  
18          claimant, but in the grand scheme and the  
19          context of the exposure that was assigned, it  
20          is a very insignificant contribution to the  
21          overall dose, to the point where it's less than  
22          -- you know, some small percentage of the  
23          overall dose. And that -- that's sort of where  
24          we're coming from. And maybe you're right,  
25          Joe. Maybe we need to do a better job

1           discussing that.

2           **MR. GRIFFON:** I guess -- I guess to me there's  
3           -- there's sort of two different questions  
4           there. One, this incident thing, I tend to  
5           agree with you on. The site experts I think  
6           can have another very valid use, and in my work  
7           I've certainly found that they -- they can shed  
8           a lot of light on operational activities, shop  
9           floor activities, implementation of procedures  
10          rather than procedures you found 40 years ago  
11          that you think probably were adhered to. You  
12          get a lot of interesting feedback as to how  
13          they were actually used in the field as opposed  
14          to how the person drafting them thought they  
15          were going to be used, and that -- that's one  
16          way we've used them and I -- I think, you know,  
17          to hear about some incidents -- I guess the  
18          only times when that became useful was -- was  
19          things that -- it put it in a context, I guess,  
20          for me on some sites where you realize that an  
21          incident that would be a reportable in 19--  
22          which I think most people know here, an  
23          incident that would be reportable today was  
24          happening on a daily or sub-daily basis in the  
25          '50's and, you know, the puffs they had in the

1 gaseous diffusion plants or whatever -- things  
2 like that that they didn't even consider them  
3 releases, they just kept -- kept on keeping on,  
4 you know. But I -- I agree with you on the  
5 incident part, but the operational aspects and  
6 things like that, I think you can get a lot of  
7 valuable -- and the prac-- the work practices  
8 and the health physics practices on the shop  
9 floor as opposed to what they were supposed to  
10 be doing.

11 **DR. NETON:** Right.

12 **MR. BELL:** I think -- this is Tom. I think I  
13 sense when we talked to the site experts what  
14 they were hoping to see is some -- something in  
15 the TBD that says look, there are certain jobs  
16 -- at the pot room and other places -- where  
17 the potential for inhalation dose is much  
18 greater, and that when the dose reconstructor  
19 does his job, he's going to take special note  
20 of that and try to take that into  
21 consideration. Because they get a sense,  
22 looking at this, that there's no -- that  
23 everybody's kind of handled the same, with an  
24 average. And I think the TBD could handle that  
25 relatively quickly by just making a statement

1           that when it gets to those specialized, high-  
2           risk jobs, that things are going to be done --  
3           when they do your worst-case reconstruction --  
4           to try to capture the data as best you can that  
5           will do that. That might make them feel  
6           better. Other words, there -- there are a few  
7           people say look, I got -- I got all that dust.  
8           I was crawling in the furnace. I was doing  
9           this kind of job. I was manually scooping  
10          stuff out. I'm different than the usual guy,  
11          and yet some of these average processes don't  
12          indicate that to him. So if we can work that  
13          out somehow, I think that would help a lot in  
14          perception.

15         **MR. FITZGERALD:** And this notion of raising  
16         these site expert recollections is really to  
17         point out that there is in fact these special -  
18         - sort of the -- the releases that are specific  
19         to that type of work and try to at least  
20         substantiate the fact that they're not in this  
21         average. And thinking about some other -- like  
22         the gaseous diffusion plants, the people that  
23         actually did a lot of transfers, when they  
24         released the pigtailed they got a puff. That  
25         was actually a part of -- kind of part of their

1           job. I mean they expected that, and yet they  
2           document the releases, but that wouldn't, you  
3           know -- necessarily a valid way and a routine -  
4           -

5           **MR. BELL:** In the report we didn't develop it  
6           in great detail. We said look, there are  
7           furnace blowouts, there are dust bag spills, I  
8           mean there are --

9           **DR. NETON:** Right.

10          **MR. BELL:** -- there's manual stirring in the  
11          pots and so are -- these are kinds of  
12          situations that are different than the normal,  
13          routine situation and need to be somehow  
14          handled, whether it be a correction factor of  
15          some type or better data for it or whatever.

16          **DR. NETON:** Right. I guess I was looking for  
17          more in the context of how -- how significant  
18          they may be. And I totally agree with what Tom  
19          said.

20          **MR. BELL:** I mean I'm sorry to argue that one  
21          way or the other.

22          **DR. NETON:** When one reads the report it looks  
23          like well, geez, there are all these other  
24          things, you'll never be able to reconstruct  
25          these doses, and I would maintain we can put

1           these in context -- and maybe that's our  
2           response. I mean that's just what we're going  
3           to respond with.

4           **MS. MUNN:** And this is Wanda --

5           **MS. WESTBROOK:** This is --

6           **DR. NETON:** I'm sorry. Wanda?

7           **MS. MUNN:** In the same context, in the report  
8           that we have in front of us that we've just  
9           reviewed, the question arose in my mind several  
10          times, how frequent were these dust bag  
11          ruptures and how severe was the distribution  
12          when it did occur? I didn't get any sense of  
13          consistency from the reports of site experts or  
14          from claimants with respect to how common was  
15          common. They said it happened a lot, but how  
16          much is "a lot"? Is that a part of -- of your  
17          overall consistent chronic dose that -- that we  
18          would anticipate, or were these really and  
19          truly quite remote incidents that could be  
20          bracketed in some way --

21          **DR. NETON:** Right.

22          **MS. MUNN:** -- with the very specific employees?  
23          I don't know how we catch the flavor of that.

24          **DR. NETON:** Right. That's what we're wrestling  
25          with, actually. I mean it's -- it's -- you

1 know, they're valid issues. I'm all for site  
2 expert inputs and I think it's very valuable,  
3 but it's difficult to capture these little  
4 episodic things in where, when you're assigning  
5 chronic doses and truly believing that you are  
6 -- especially if you use the upper end of the  
7 distribution -- accounting for these type of  
8 incidents.

9 **MR. GRIFFON:** I think something --

10 **DR. NETON:** It's an explanation issue.

11 **MR. GRIFFON:** I think something we've all been  
12 wrestling with from the very beginning is this  
13 -- you know, my -- one of my concerns is  
14 missing the trees for the forest, that -- that  
15 idea that you've got that one person that  
16 worked the job, which ends up being at the high  
17 end of your air sampling distribution, and this  
18 -- this poor fella just happened to be there  
19 for his whole ten years, but you're assigning  
20 this distribution to that person as opposed to  
21 this -- this end of the distribution.

22 **DR. NETON:** Well, that's another issue and  
23 we're --

24 **MR. GRIFFON:** It's another issue, but -- but  
25 part of the site experts helped me in the past

1 is identifying these certain areas where you  
2 maybe say wait a second, maybe -- maybe if they  
3 worked in, you know, building 51-C, you know,  
4 this annex was really nasty. Everybody's  
5 telling us. Maybe we can look a little harder  
6 into that one and have to have a subsection on  
7 that to treat people that only worked in that  
8 building or some -- you know.

9 **DR. NETON:** Right.

10 **MR. GRIFFON:** And I know when I -- when I  
11 talked to you guys in the -- you know, like --  
12 like I've talked -- had this conversation with  
13 Dick and others, that -- Dick Toohey -- that,  
14 you know, well, we can't chase down and do a --  
15 a -- that level on every building on every  
16 site, obviously, but -- you know, maybe if you  
17 -- these site expert meetings can help some of  
18 those pop out and -- you know, that need more  
19 attention and more specifics.

20 **MR. BELL:** Well, let me ask a question there.  
21 The upper end business you're talking about,  
22 the 95 percentile, is bothering me because I --  
23 I'd like you to point out maybe, if you can,  
24 where the TBD elicits that kind of thing. I  
25 mean it talks about the time-weighted averages

1           that it -- which is an average, okay? I don't  
2           think there are many situations where that's  
3           applied. And maybe when you get into high-risk  
4           jobs, that's a situation where it should be  
5           applied, and that's something you'd look into  
6           as a potential way to solve some of this.

7           **DR. NETON:** You raise a good point. We're in  
8           the area of evolving policy at this point. We  
9           believed early on that the distribution was  
10          repre-- representative of the worker was  
11          adequate to define their exposure and that the  
12          99th percentile that was mandated by Congress  
13          sort of took care of the uncertainty, and you  
14          don't know exactly and that's where -- that's  
15          where it was accounted for. SC&A has several  
16          times now pointed out that we're not  
17          necessarily covering these worst exposed --  
18          most exposed workers, highest exposed workers,  
19          using a generic distribution of the whole work  
20          force. So I think you'll see that our policy  
21          may be shifting towards using the 95th  
22          percentile of the distribution as a constant  
23          input value to account for that uncertainty of  
24          who was where and when. 'Cause it's a nice  
25          idea to say on paper you need to account for

1           these people. But for 50-year-old records, we  
2           really don't know who was where.

3           I mean you take a case like a Bethlehem Steel,  
4           just because a person put on their application  
5           they were a cafeteria worker doesn't mean in  
6           1948 they weren't walking through the plant  
7           doing stuff. And so to be claimant favorable,  
8           we would -- and again, this is policy evolving  
9           -- we were considering very strongly adopting  
10          the 95th percentile of all these distributions  
11          as representa-- not representative, as claimant  
12          favorable or a more -- more consistent approach  
13          that would represent the more highly-exposed  
14          worker, even given, you know, that a large  
15          percentage of those workers are not going to  
16          receive -- would never have received that  
17          exposure. I think that -- that -- it's hard  
18          not to argue against that now.

19          **MR. BELL:** I think it'd be very helpful in your  
20          worst-case situation to do that.

21          **DR. NETON:** Yeah. And if we do know -- for  
22          example, let's take the case where we have  
23          coworker data and we can truly demonstrate that  
24          people who were not monitored at a certain  
25          facility really had low potential for exposure,

1 and we had coworker data for people who were  
2 monitored that had higher potential, then it  
3 may be appropriate to use that distribution for  
4 those people who weren't monitored. Not  
5 necessarily -- you know, it wouldn't make sense  
6 to us to take the 95th percentile of the most  
7 exposed workers and assign it to people who we  
8 believe are less --

9 **MR. BELL:** Less exposed.

10 **DR. NETON:** So whether we took the mean value  
11 or could use the distribution, it would  
12 effectively come out the same way in IREP but -  
13 -

14 **MR. BELL:** That makes sense.

15 **DR. NETON:** -- we're -- that's an evolving  
16 policy decision on our part.

17 **MR. FITZGERALD:** On this particular issue, just  
18 to go back, I think this also sort of raises  
19 this question again, and I suspect we'll be  
20 touching on this on all the profiles. That's  
21 why I'm kind of interested 'cause it is a sort  
22 of a generic issue. And I like the notion of  
23 bracketing, because I think that kind of  
24 captures what we're sort of after, which is  
25 okay, it's understood that a lot of these cases

1           it's going to be fully accommodated and  
2           enveloped by your chronic measurement. Now  
3           there's a question of whether to clarify that  
4           better in the TBD. I think there's some  
5           confusion because it's not explicit in the TBD,  
6           so -- you know, there's a lot of workers and  
7           others that say well, how am I being addressed,  
8           and it actually would be addressed but it's not  
9           clear. It's implicit. However, there's going  
10          to be instances where, by virtue of work--  
11          worker category or facility-specific where  
12          perhaps these releases are reflective of a  
13          certain work condition or worker category where  
14          it would call for maybe a bracketing of some  
15          sort where you give maybe additional reflection  
16          of that exposure potential, come up with some  
17          approach that's not the generic, not the  
18          chronic. And I think that's where, you know --  
19          I think we're both right in a sense. We're  
20          coming to it and saying well, you know, we're  
21          concerned there's certain instances, we're  
22          hearing from the workers, site experts, that  
23          maybe the kind of work they were doing, the  
24          location they were at, they're not norm, that -  
25          - you know, certainly they're going to get more

1 exposure. We don't know what to do with that.  
2 It probably requires you go back and, you know,  
3 do further review of more documentation,  
4 corroboration perhaps. But that's kind of I  
5 think where we're coming from, that perhaps  
6 those instances ought to be bracketed better.  
7 Not to say it's a generic where you do the  
8 whole site profile that way, but certain  
9 situations perhaps require -- similar to what  
10 we just talked about -- require maybe a special  
11 treatment so far as to substantiate maybe they  
12 should be given more credit by virtue of  
13 location or worker category. And maybe the  
14 site expert testimonials are a way to tweak  
15 that, to say okay, these folks apparently did  
16 get more puff releases. Maybe we should look  
17 for more substantiation as to whether that in  
18 fact occurred. So I -- I think -- this is not  
19 an easy one where we're saying it's either this  
20 or that. I think actually it comes down to a  
21 little more granulation on how that's treated,  
22 and that's -- perhaps would be an evolution of  
23 sorts in how this is grappled with. I get the  
24 sense that each site's going to be similar  
25 'cause my experience at DOE sites is yeah, you

1 know, there's this vast norm, and then there's  
2 a couple of facilities and worker categories,  
3 even within the same facility -- the cascade  
4 workers at Portsmouth, you know, the workers  
5 that were at the -- the end of that process  
6 where they're dealing with the higher uranium  
7 assays were definitely exposed to more, and so  
8 you couldn't just take them as a lump. You  
9 have to kind of distinguish what kind of  
10 cascade worker were you and what -- what --  
11 what stage of the cascade did you work at,  
12 because that's going to be a determiner. So I  
13 think that's where we're really raising some  
14 question as to whether that might be an  
15 approach that -- specific to Mallinckrodt but  
16 probably even more generic to them.

17 **DR. NETON:** I agree with you. I mean where it  
18 makes sense to flesh out the individual  
19 circumstances, it makes perfect technical  
20 sense. The problem comes when you're doing  
21 18,000 of something and you say well, fine, you  
22 know, a couple of hundred workers here and  
23 there, it adds a lot. The research adds time  
24 and it adds just a lot of effort to the dose  
25 reconstruction load, and you can see where

1 we're trying to come from. We're trying to  
2 develop these generic models that would include  
3 those people and probably, by virtue of  
4 including them, compensate some other folks who  
5 may not be in that envelope, but we'd rather  
6 err on that side than not, and move these dose  
7 reconstructions forward. So when -- your  
8 example of the cascade impactor, I'd say we --  
9 we'd probably prefer to take the highest guy at  
10 the end, model it and assign it and assume  
11 everybody was there, because we're never going  
12 to be able, with any degree of confidence,  
13 figure out who was there.

14 **MR. FITZGERALD:** And in that case it would be a  
15 matter of making that a little more explicit --

16 **DR. NETON:** Right.

17 **MR. FITZGERALD:** -- in the TBD. And in our  
18 instance we would raise this kind of feedback  
19 to perhaps test the clarity --

20 **DR. NETON:** Right.

21 **MR. FITZGERALD:** -- and whether or not in fact  
22 that's fully accommodated. And maybe in  
23 certain cases we'll find, by virtue of site  
24 expert feedback, that where -- you know, maybe  
25 there was some thought that it was accommodated

1 or enveloped, in certain cases it may be sort  
2 of revelatory information that okay, maybe  
3 these guys actually got exposures that were  
4 outside of the chronic treatment, so perhaps  
5 they may need to be bracketed as a special  
6 group. And I think that's the value of at  
7 least doing the site experts 'cause it sort of  
8 substantiates whether your premise is in fact  
9 the right premise in terms of assigning the  
10 chronic -- but you've aimed high enough and it  
11 accommodates it, or there's certain people that  
12 have been missed and actually they're on the  
13 high end that aren't accommodated. So I -- I  
14 think that would be the way I would look at  
15 this, that -- in terms of how it's explained in  
16 the TBD, it would be useful to have it -- as  
17 you have just explained it made it a little  
18 clearer so that the workers are going to say  
19 okay, I understand. You know, I did get these  
20 releases, but apparently the conservatism of  
21 the overall distribution takes care --

22 **MR. GRIFFON:** Takes that into account.

23 **MR. FITZGERALD:** -- or we might actually find  
24 instances where they're adding new information  
25 that would demonstrate that somebody actually

1 falls out, potentially. In which case that  
2 should be accommodated perhaps as a special  
3 group. I don't know. Maybe we won't see that.  
4 And clearly, the conservatism may very well  
5 address most of that. But we're going to I  
6 guess keep testing it by virtue of doing that.

7 **DR. NETON:** That's fine. I think it was a  
8 valuable discussion. I think we'll --

9 **MR. FITZGERALD:** Okay.

10 **DR. NETON:** I don't know that we've decided  
11 anything on this issue, but I think we see  
12 where we're both coming from and I think we  
13 take -- we'll take it to heart that we do need  
14 to document better in the profiles. If we try  
15 to be conservative and we can't, we need to  
16 document that because, realistically, when  
17 these things were developed we viewed them as  
18 being used by health physicists, and never  
19 envisioned the public scrutinizing these things  
20 to the extent they are. And not that we're  
21 trying to hide anything, it's just that they're  
22 technical documents. But where we can, I think  
23 we need to do that -- a better job of that --  
24 total agreement there.

25 **MS. ROBERTSON-DEMERS:** This is Kathy. There is

1 a small section in the Mallinckrodt TBD that  
2 Janet put in there about various incidents that  
3 occurred. And I actually think that that's a  
4 very, very good idea, so that you can  
5 communicate those things with the dose  
6 reconstructors so that they know this is not  
7 the ordinary case.

8 **DR. NETON:** Right. I also agree, though, that  
9 if we put them in there and try to use those in  
10 bracketing -- to test our bracketing  
11 assumptions, to a certain extent, at least in  
12 that way we're more transparent in addressing  
13 them. I mean right now most of the profiles  
14 are silent on incidents. I think we -- and  
15 I've always maintained this was not the place  
16 to address all incidents. But I think if we do  
17 include acknowledgement that incidents  
18 occurred; here's some examples of the types of  
19 incidents that occurred and here's the  
20 magnitude of how they would play into what  
21 we've assigned, and we do need or do not need  
22 to specially address these based on what we're  
23 assigning in the profile --

24 **MR. GRIFFON:** That would go a long ways toward  
25 your credibility.

1           **DR. NETON:** Yeah, it would certainly ensure  
2 more transparency -- I'm not crazy about that  
3 word, but -- but it's true, more transparency  
4 and -- and credibility, I guess.

5           **MR. SCALSKY:** We have started to address  
6 incidents more in the later TBDs and site  
7 profiles.

8           **DR. NETON:** Okay, zipping along, do we want to  
9 break for lunch right at noon? Is that okay  
10 for folks or --

11          **MS. MUNN:** As long as it isn't any later than  
12 that.

13          **DR. NETON:** One thing -- I have to apologize.  
14 We have not made any special provisions for  
15 lunch. We're not having anything brought in or  
16 catered, so when we do break for lunch, it's  
17 sort of catch as catch can. Folks are on their  
18 own. I have another meeting to go to at lunch  
19 and shortly thereafter, so I won't be helping  
20 out in those efforts, but various folks around  
21 the table know, there's places fairly nearby --  
22 within a couple of miles -- that have  
23 reasonable food, and there's also the vending  
24 machines if one feels that -- take that  
25 challenge.

1           **MS. MUNN:** Those of us who don't have wheels  
2           may be a little constrained.

3           **DR. NETON:** Well, there may be some people who  
4           have cars that could help with --

5           **MR. RUTHERFORD:** We probably have enough  
6           wheels, yeah.

7           **DR. NETON:** I do apologize, but I just didn't  
8           think about it. Okay, so we'll break right  
9           around noon or as close as makes sense, given  
10          the schedule.

11          Okay. Anybody else from ORAU -- I feel like  
12          I've been doing all the talking -- on site  
13          experts or questions, comments, issues?

14          **MS. WESTBROOK:** I --

15          **DR. NETON:** Janet?

16          **MS. WESTBROOK:** -- did want to say something  
17          about that. You know, I totally agree with  
18          you, from my prior operational work in health  
19          physics, that it's very important to consult  
20          the worker about how the worker -- work is  
21          actually going to be done, and I hope you'll  
22          keep the poor TBD author in mind when you make  
23          your comments, because when you say oh, this  
24          ought to be in, that ought to be in, guess  
25          who's probably going to have to do it? That's

1           going to be me, so I'm feeling a little  
2           overwhelmed now.

3           About those incidents, you seem to have  
4           suggested that I -- it was my idea to put the  
5           list of incidents in the TBD. It absolutely  
6           was my idea to do that. I think it was the  
7           pioneer of listing the incidents in the TBD  
8           because I thought that the credibility issue  
9           was important, but also that way -- even if we  
10          didn't know much about what happened -- at  
11          least we could -- we could put every -- I put  
12          every single incident, every little blip that I  
13          could find -- other than I think there was one  
14          little thing which apparently was a  
15          chronically-occurring thing so, I think I  
16          mentioned that in there somewhere but not in  
17          the incident section -- but I did feel that it  
18          was very important to put all those in there.  
19          But what you see there is all we know about  
20          them. Unless in those six boxes of documents  
21          there's more about them, that's all we know.  
22          And so in terms of incorporating or figuring  
23          out a little addendum on their dose to account  
24          for that, I just do not -- if I had been able  
25          to think of a good way to do that, I would have

1           done that. But I think that Jim's point about  
2           a long-term worker with chronic dose, how the  
3           incident probably doesn't add that much to his  
4           dose -- even though, wow, you know, the  
5           concentration goes up 100 times -- and probably  
6           it all comes out in the wash, and especially if  
7           you go up to the 95th percentile. But my  
8           feeling is, except for a very few things,  
9           probably it was only like the momentary puff  
10          and pretty soon dissipated. So I think -- this  
11          is just my impression, reading the actual  
12          documents where they said oh, this -- you know,  
13          there was the explosion in the ether house -- I  
14          think you could -- there then it comes on the  
15          claim subject or his succes-- or some coworker  
16          to say this is what happened, and then we can  
17          take that information into account. But if we  
18          don't have it like written down, this is the  
19          year it happened or -- or this is how it  
20          happened, this -- I've not ever gotten to talk  
21          to any of those workers, the site experts. I  
22          sure would like to do that 'cause boy they --  
23          I'm sure I could say well, how did you  
24          pronounce F-E-I-N-C. I am always calling it  
25          feinc, but maybe they pronounced it feenc or

1 something like that. Anyway, that -- but I  
2 think they could -- if they would flesh out  
3 their description of these incidents, then it  
4 would be so much better for -- even if it's not  
5 in a TBD, but for the dose reconstructor to be  
6 able to figure out what extra little dose he  
7 might possibly justifiably add onto that.

8 **MR. BELL:** Janet, a dynamic that we noticed of  
9 the site experts is sometimes a subject would  
10 come up -- and I don't think people were making  
11 some of these things up -- but if they -- one  
12 person talked about it, the other person would  
13 recollect -- oh, yes, I had the same problem or  
14 worse, or this happened or that happened. And  
15 that -- that synergism of several people  
16 mentioning that they had the same problem adds  
17 a little credibility that they aren't just  
18 saying something that's -- you know, to try to  
19 help get their compensation. And you can't --  
20 you can't really grab that dynamic very well  
21 till you actually hear it, so -- and we had the  
22 luxury, really, of having a number of people  
23 come to that meeting, so -- which normally we  
24 don't do. I mean we usually have two, three or  
25 four people, maybe. So that was an interesting

1 dynamic and I think helped us a lot in  
2 beginning to think well, there -- maybe there's  
3 some credibility to some of these things, so...

4 **MS. MUNN:** Of course there's the human tendency  
5 --

6 **MR. BELL:** To overestimate, that's right.

7 **MS. MUNN:** -- to embellish. To embellish.

8 **MR. BELL:** And what's high to them, you know,  
9 may not be really high and that kind of thing,  
10 and you have to account, so...

11 **MS. ROBERTSON-DEMERS:** This is Kathy. What  
12 have you done with respect to reviewing the  
13 claimant interviews and composing a list of  
14 incidents or high-risk jobs from those  
15 documents?

16 **MS. WESTBROOK:** This is Janet. I read all of  
17 the claims that were indicted to me by my  
18 supervisor at the time were on the O drive or  
19 wherever it is we go now for this. If any new  
20 claims have come up since I reviewed that,  
21 that's been some months ago, but it was prior  
22 to the August revision coming -- of this TBD  
23 coming out, and I compared what they said to  
24 the known incidents that were documented in the  
25 record. And there a couple of vague things

1           that were said, and so I've just -- you know,  
2           I've been keeping it in the back of my mind. I  
3           think I've got a bunch of papers of to-be-  
4           checked when I do the final review, and one of  
5           those is the notes of that. So as far as  
6           actually incorporating anything, so far that  
7           hasn't been done, but it's definitely on the  
8           to-do list if it seems like it might be  
9           something that ought to be mentioned.

10          **MS. ROBERTSON-DEMERS:** One of the things that I  
11          noted when interviewing site experts, worker  
12          experts, is that they have no idea what an  
13          incident is.

14          **MS. MUNN:** Uh-huh, true.

15          **MS. ROBERTSON-DEMERS:** So somehow you need to  
16          communicate that better to them so that when  
17          they go through their interview they're able to  
18          say oh, yeah.

19          **DR. NETON:** Yeah. Well, I think the interview  
20          -- it might say "incident", but I think there's  
21          -- there's a lot of different questions to get  
22          to there --

23          **MR. BELL:** There's questions to try to get to  
24          that, you're right.

25          **DR. NETON:** There's a lot of different ways to

1 try to get to there, you know -- has anything  
2 happened, were you contaminated, did you have  
3 (unintelligible), all that kind of stuff.

4 There's always a better way. If there's any  
5 suggestions that you have that you've learned  
6 from the workers, we'd be more than happy to  
7 hear them.

8 I'm happy that came up 'cause that was one  
9 thing I feel that we -- you know, we don't get  
10 credit for enough is that we do interview all  
11 the workers. And yes, about 50 percent of our  
12 claimants are -- are not -- workers are  
13 deceased, but about 50 percent are alive. And  
14 so we've interviewed, you know, 50 percent of  
15 the cases looking for incidents. And on top of  
16 that, then those incidents need to be  
17 considered in the dose reconstruction itself.  
18 You cannot -- we've instructed ORAU when they  
19 do dose reconstructions, that that dose  
20 reconstruction part in some way needs to  
21 address what the claimant asserted about  
22 incidents or exposures that may deviate from  
23 what we've modeled. So -- and to that extent,  
24 it's in there. I kind of wish we would get  
25 more credit for that because we're always

1           portrayed as not talking to workers, but we've  
2           talked to more workers than anybody. We've  
3           talked to about, by my calculations, 7,500  
4           workers, 'cause if half of them -- or over  
5           8,000 workers, so we've done a lot of  
6           interviews. And I'm glad that Janet's pointed  
7           out that she has reviewed the interviews for  
8           inclusion in the profile, so --

9           **MR. SCALSKY:** Jim, I think that's part of the  
10          process that the dose reconstructors go to. I  
11          mean they certainly look at --

12          **DR. NETON:** Well, they have to.

13          **MR. SCALSKY:** -- even the TBD. Yeah, the dose  
14          reconstructors have to, and the TBD authors  
15          have been looking at the CATI interviews to  
16          make sure that they capture this type of  
17          information. And you know, other than I think  
18          in the early years when maybe the dosimetry was  
19          not as adequate or as good, typically for small  
20          incidents and, you know, everyday operational  
21          things, they feel that the normal dosimetry  
22          programs, whether it's bioassay or badges, take  
23          into consideration those types of incidents.  
24          And any of the major incidents are usually  
25          documented and they're evaluated, you know, so

1           these things are taken into consideration in  
2           one form or another.

3           **DR. NETON:** But we do acknowledge that there  
4           may be some unrecorded or chronic situations  
5           that we don't have.

6           **MR. BELL:** Can I ask a quick question and we --  
7           we -- I don't think we resolved it. What's the  
8           best way to refer to the database that you all  
9           have on line? I mean I just call it the ORAU  
10          database, for nothing better, but it -- do you  
11          have a preference on how we describe that?

12          **DR. NETON:** I think if you call it the site  
13          research database --

14          **MR. BELL:** You like that terminology better?

15          **DR. NETON:** -- that's what we've kind of --

16          **MR. BELL:** Site research database.

17          **DR. NETON:** That's what we use internally here.  
18          When we talk about what SC&A is using, we  
19          always say well, they're using the site  
20          research database.

21          **MR. BELL:** Okay, because I -- and there are a  
22          number of situations where I refer to that and  
23          I may not even have been consistent, so -- all  
24          right.

25          **DR. NETON:** It's a compendium of all the PDF

1 files that we've captured.

2 **MR. BELL:** Okay, fine. 'Cause obviously the  
3 people reading this, the workers and so forth,  
4 are going to be interested in what that is.

5 **MS. WESTBROOK:** We called it the O drive  
6 because that was its physical location and not  
7 a characterization of the -- is it a database  
8 or is it a library. If you call it the O drive  
9 you know you're always right and it's two  
10 syllables.

11 **DR. NETON:** But the O drive doesn't --

12 **MS. WESTBROOK:** I know.

13 **MR. BELL:** I think the site research has an  
14 impact on -- that's at least where you go when  
15 you want to do research. That's a good  
16 connotation.

17 **DR. NETON:** Or we go on the sites to collect  
18 the research information necessary and --

19 **MR. BELL:** Okay. Well, that's good. Okay.  
20 Thank you.

21 **DR. NETON:** Okay, any other questions or issues  
22 that we need to talk about on site experts? I  
23 think this was a very fruitful discussion.

24 **DISCUSSION TOPIC 3**

25 Okay, the third discussion topic has -- getting

1 a little more specific here with some of the  
2 comments. The mechanism for potential exposure  
3 to UNH identified in the report is unclear.  
4 There was some indications I believe that  
5 talked about people testing the atmosphere with  
6 litmus paper, which of course would indicate  
7 the presence of nitric acid vapors or something  
8 to that effect. I mean UNH itself is typically  
9 in solution. It's uranyl nitrate hexahydrate  
10 or something to that effect. It's a liquid  
11 solution -- nitric acid solution of uranyl  
12 nitrate. So how that becomes airborne and  
13 becomes an exposure potential, other than  
14 through agitation processes with mechanical  
15 generation of physical particulate is not clear  
16 to us. We're not --

17 **MR. BELL:** Well, our impression was they were  
18 talking about liquid aerosol, which -- which --

19 **DR. NETON:** And how would that --

20 **MR. BELL:** -- which you're able to inhale it  
21 again.

22 **DR. NETON:** Well, is there a generation process  
23 behind that that we can point to? 'Cause short  
24 of --

25 **MR. BELL:** Well --

1           **DR. NETON:** -- spraying it --

2           **MR. BELL:** -- when you get -- when you get to  
3           the O3 lumps that they broke up with crude  
4           mashing and --

5           **DR. NETON:** That I can understand.

6           **MR. BELL:** -- grinding processes, then I think  
7           there's a possibility that -- that this -- that  
8           you can get something out of it. That was one  
9           part. Okay?

10          **DR. NETON:** No problem.

11          **MR. BELL:** And they didn't -- they didn't talk  
12          specifically about this, but I was trying to  
13          look at the process. The other one was a  
14          potential where the airborne uranium dust was  
15          reported to be a problem around the brown oxide  
16          furnace, and in that case there may be a  
17          potential to have it aerosol, in a way. So --

18          **DR. NETON:** Well, brown oxide --

19          **MS. WESTBROOK:** Could I --

20          **MR. BELL:** -- maybe --

21          **MS. WESTBROOK:** -- address that?

22          **MR. BELL:** -- maybe you can clarify that  
23          because -- yeah. These are just guesses. I  
24          really don't know.

25          **MS. WESTBROOK:** This is Janet. Now you know

1           it's digested. It's had all the stuff  
2           extracted and now it's in the UNH form. Then  
3           it goes into what's called the pots.

4           **MR. BELL:** Right.

5           **MS. WESTBROOK:** Okay? And in there, they pass  
6           the gas over it -- the acid gas over it and  
7           cook it, so -- so there is a potential for  
8           heat-induced fumes. My feeling is, because  
9           they weren't able to chip all the stuff off the  
10          pots and they didn't necessarily clean down the  
11          outside, I think that what was being measured  
12          in the air in the before powder one, if you  
13          notice -- as you all note in here, there's the  
14          -- after the UO<sub>3</sub> has formed, so that's the --  
15          after powder has formed, and then there's  
16          before it has formed when you've got the wet --  
17          the liquid UNH in the pot and the gas is  
18          passing over it. They did measure a high  
19          level, but not anywhere near the powder part.  
20          I think that was just due to the fact that it's  
21          heating up and some of the UO<sub>3</sub> powder that's on  
22          the outside of the pot and on the connections  
23          is coming back off again due to the -- like the  
24          thermal drafts and stuff like that.  
25          Also I'm sure they could smell acid. I'll bet

1 the connections were not such -- so tight that  
2 no acid would ever get out. I'll bet you could  
3 smell the acid fumes, as well, and those fumes  
4 might also help waft out the UO3. But as far  
5 as that powder being UNH, I think that's very  
6 unlikely because, as he said, unless you have  
7 agitation processes or whatever, or -- or some  
8 kind of pressurization, it's just not going to  
9 come out.

10 **UNIDENTIFIED:** This is --

11 **MS. WESTBROOK:** And they actually in fact went  
12 back -- when they did it -- in the days when  
13 they were using the buildings in the 50 series  
14 in plants one and two, they did that cooking in  
15 open pots. I believe if the -- if the -- if it  
16 aerosolized that easily, they would not have  
17 used open pots. They eventually went to closed  
18 pots, but of course that was because probably  
19 they had so much greater quantities and the  
20 acid fumes would just, you know, knock somebody  
21 over if they did that. But I -- I think that  
22 what we're looking at here is really not a  
23 significant possibility of UNH in the air, but  
24 --

25 **MR. BELL:** Janet, do you --

1           **MS. WESTBROOK:** -- I'm certainly open to  
2           contradiction.

3           **MR. BELL:** Do you have that much confidence in  
4           their radiation safety process to be able to  
5           have detected that back in those days? I can  
6           see at 180 C. and --

7           **MS. WESTBROOK:** I'm just looking at it again  
8           from an engineering standpoint, what -- what  
9           would be most likely to have happened.

10          **MR. BELL:** I got the impression while  
11          (unintelligible) run there was nobody standing  
12          there with meters or monitors or other things  
13          to --

14          **DR. NETON:** Right, but --

15          **MR. BELL:** -- trying to assess this potential,  
16          so I guess the question is how do we -- how do  
17          we really know for sure what happened.

18          **DR. NETON:** Yeah. But again, I'm not sure  
19          there's a mechanism to get UNH airborne in that  
20          process. It just doesn't -- it doesn't follow  
21          from what I know about the processing and UNH,  
22          and experience at places like Fernald where UNH  
23          is not considered to be an airborne hazard  
24          unless there was some process to agitate it,  
25          aerosolize it --

1           **MS. WESTBROOK:** I did an extensive search on  
2           the internet trying to find out anything about  
3           airborne UNH and dust and air and all different  
4           combinations of search terms, and the only  
5           thing I could find that addressed that issue at  
6           all was an incident that happened somewhere --  
7           and I forget where, but maybe Hanford or  
8           someplace like that -- where they had  
9           aerosolized UNH because it -- it was  
10          pressurized and something gave way and the  
11          liquid exploded out, and you could have any  
12          liquid go aerosol that way. But other than  
13          that, there was no mention of people taking  
14          measurements of UNH. Even France, they weren't  
15          even -- you know, nothing -- nothing there, so  
16          --

17          **DR. NETON:** It just struck us as being  
18          inconsistent with what --

19          **MR. BELL:** Well, how about the crude mashing  
20          and grinding process? I mean isn't there a  
21          potential there for that to happen -- when they  
22          were breaking up these lumps of UO<sub>3</sub>?

23          **DR. NETON:** Well, UO<sub>3</sub>, yeah. But we're not --  
24          we're specifically examining UNH here. UNH is  
25          --

1           **MR. BELL:** Well, isn't that -- when you're  
2 getting to that phase, isn't that a potential,  
3 though? The molten salt is directed in batch  
4 from the gas fire hydration pots to so --  
5 disasso-- disassociate the hexahydrate from the  
6 solution, and it'd seem to me that's the point  
7 where that might have happened.

8           **MS. WESTBROOK:** Well, that's -- that's the --  
9 before it turns to powder, but it's cooking in  
10 the covered pot. Okay? And it's forming the  
11 powder. And once it's formed the powder and is  
12 done -- I forget how they can tell -- then they  
13 open up the pot and that's when the dust really  
14 started. The worker had to chip it out or  
15 later on use the gulper to get it out, and  
16 that's where all the powder came out. But that  
17 was after it had formed UO<sub>3</sub> and was no longer  
18 UNH. So unless there was some reacted UNH in  
19 there, it wouldn't have done that. But in that  
20 case it would have been kind of liquid down in  
21 the bottom and they would have noticed it and  
22 probably covered the pot again and give it  
23 another go.

24           **DR. NETON:** I don't -- maybe this falls into  
25 the area of a claimant --

1           **MR. BELL:** Yeah, I'm not sure --

2           **DR. NETON:** -- or worker interview that  
3           raised an issue, but technically it's  
4           hard to --

5           **MR. BELL:** I mean you asked in what part of the  
6           process, and I tried to go back and evaluate --

7           **DR. NETON:** Oh, sure.

8           **MR. BELL:** -- where that -- where that could  
9           have occurred, and I -- it's a matter of  
10          interpretation, really. I mean they did not  
11          specifically go in and say that's exactly what  
12          it happened, so --

13          **DR. NETON:** They were exposed to uranyl nitrate  
14          in the plant from -- you know --

15          **MR. BELL:** Is that -- is that your recollection  
16          on the interviews?

17          **MS. ROBERTSON-DEMERS:** Well, I've got something  
18          else to say.

19          **MR. BELL:** Oh, all right. Go ahead, please,  
20          then.

21          **MS. ROBERTSON-DEMERS:** I actually had two  
22          concerns. Just let me give you a little bit of  
23          background on the general safety atmosphere of  
24          Mallinckrodt. They were more concerned about  
25          the chemicals and they had very little concern

1 over the radiological hazards, so likely when  
2 they decided to close the pots or the kettles,  
3 whatever you want to call them, they did that  
4 because of a chemical safety hazard.

5 Where I was a little bit concerned about the  
6 uranyl nitrate is in the denitrification  
7 process. Early on they didn't have agitators  
8 that were automated. They had to do it  
9 themselves. They had to stir it.

10 **MR. RUTHERFORD:** You're talking the early '42  
11 to '45 period where they actually did the  
12 mechanical agitation by hand, did that --

13 **MS. ROBERTSON-DEMERS:** Right --

14 **MR. BELL:** I don't think they got the new  
15 mechanicals till they'd built the newer plants  
16 back in '48, '49, somewhere in --

17 **MR. RUTHERFORD:** Actually '46 had the newer --

18 **MR. BELL:** Did they have some of that --

19 **DR. NETON:** '46 is when they changed the  
20 process.

21 **MS. ROBERTSON-DEMERS:** There were brown fumes  
22 that came off this process, and I guess our  
23 concern would be did any of the uranyl nitrate  
24 come up with those brown fumes.

25 **MS. WESTBROOK:** I thought the brown fumes were

1 acid fumes.

2 **MS. ROBERTSON-DEMERS:** They are, but the  
3 question is did any of that --

4 **MS. WESTBROOK:** Right.

5 **MS. ROBERTSON-DEMERS:** -- travel up with that.

6 **MS. WESTBROOK:** I think it's highly unlikely.  
7 I think we'd notice this in even the literature  
8 of today where they worry about stuff like  
9 that, like boiling stuff in a hood in a lab or  
10 whatever, and they don't seem to. And again, I  
11 -- I -- you know, if you can dig up some  
12 source, I'll be happy to -- to evaluate it in  
13 light of where in this process this might have  
14 occurred and say okay, at this point in the  
15 process just assume it's type -- whatever UNH  
16 is. But my feeling, both from what they have  
17 said and from what -- what's likely physically,  
18 is that probably little of that stuff that was  
19 blowing -- wafting around in the air,  
20 especially staying suspended in the air, was  
21 UNH.

22 **MS. ROBERTSON-DEMERS:** The other area that I  
23 had a concern about it maybe becoming airborne  
24 is in the laboratories --

25 **MS. WESTBROOK:** Yes.

1           **MS. ROBERTSON-DEMERS:** -- where they were  
2           testing it --

3           **MS. WESTBROOK:** Uh-huh.

4           **MS. ROBERTSON-DEMERS:** -- in the beginning --

5           **MS. WESTBROOK:** Uh-huh.

6           **MS. ROBERTSON-DEMERS:** -- because they didn't  
7           have as tight controls over that process --

8           **MS. WESTBROOK:** But even then they had the --

9           **MS. ROBERTSON-DEMERS:** -- as they would have.

10          **MS. WESTBROOK:** -- ventilated hoods. But they  
11          might have been doing that on a bench, or --

12          **MS. ROBERTSON-DEMERS:** But the fact that those  
13          were --

14          **MS. WESTBROOK:** -- just a bench top, who knows.

15          **MS. ROBERTSON-DEMERS:** Well, they seemed to be  
16          kind of inventive back then. One of the  
17          documents we reviewed -- essentially they put  
18          this stuff together, set it on fire and stepped  
19          back.

20          **MS. WESTBROOK:** I haven't seen that document.

21          **MS. ROBERTSON-DEMERS:** So -- well, we can --

22          **MS. WESTBROOK:** You should, you should.

23          **MS. ROBERTSON-DEMERS:** We can give it to you.

24          **MS. WESTBROOK:** Anything that we don't have,  
25          you should send us. And if you found it on 0

1 drive, I'd sure be happy to have the address.

2 **MR. BELL:** Which one was that? Which question  
3 was that?

4 **MS. ROBERTSON-DEMERS:** I've got it.

5 **MR. BELL:** Oh, okay.

6 **DR. NETON:** You're talking about the early time  
7 frames where this was an issue? The earlier  
8 operations, '42 to '45?

9 **MS. ROBERTSON-DEMERS:** Yeah, this is when they  
10 were testing the process.

11 **DR. NETON:** I think we would be in agreement  
12 that anything that happened in those time  
13 frames is suspect. We have very little  
14 information as to what -- what occurred. We're  
15 in agreement with you that those processes were  
16 fairly loose and difficult to characterize.  
17 Okay.

18 **MR. FITZGERALD:** Well, it sounds like where  
19 we're leaving that is whether we can provide  
20 further substantiation on the aerosolization  
21 then of UNH.

22 **DR. NETON:** Right, particularly after -- you  
23 know, in the early years.

24 **MR. FITZGERALD:** In those early days.

25 **DR. NETON:** Is there some plausible mechanism

1 of generating airborne UNH. From a dosimetric  
2 perspective it would be probably -- UNH has a  
3 fairly low dose per unit intake compared to  
4 other -- other forms, so -- I mean it goes  
5 through the body pretty rapidly. I don't know  
6 whether it's one of those things really worth  
7 investing too much time because it's a fairly  
8 low dose per unit intake. If it were some  
9 other form like UO<sub>2</sub>, then you've really got a  
10 much bigger dose.

11 **MS. ROBERTSON-DEMERS:** I have another question  
12 related to the UNH. In the back, in the  
13 consistency section, I think we mention that at  
14 one site you were using one solubility class  
15 and at Mallinckrodt you were using another.

16 **MR. BELL:** I didn't see that.

17 **DR. NETON:** For...?

18 **MS. ROBERTSON-DEMERS:** Is there a reason for  
19 that?

20 **DR. NETON:** I'm not sure, which -- I don't  
21 recall the comment now, but -- was it for  
22 uranium?

23 **MS. ROBERTSON-DEMERS:** It was, I believe,  
24 specific to that compound.

25 **DR. NETON:** Now there was an issue -- well,

1 where we don't know, we will use the most  
2 claimant favorable solubility class. But where  
3 we do know what the actual process was and what  
4 was being made -- for instance, I'm aware that  
5 at Blockson Chemical we used type M because  
6 when they made the material it was -- there are  
7 research indications that say it's --

8 **MR. RUTHERFORD:** Page 50, Kathy, at the bottom.

9 **DR. NETON:** -- for some fraction...

10 **MR. BELL:** I think we're more concerned about  
11 why type F wasn't used than...

12 **DR. NETON:** Well --

13 **MS. ROBERTSON-DEMERS:** Essentially that's just  
14 a question --

15 **DR. NETON:** Okay. Well, for -- I think -- I  
16 guess what the issue there is that we believe  
17 there was exposure to type F material at  
18 Mallinckrodt in the process. I don't know. I  
19 think type F would be uranyl nitrate. So if we  
20 were to come to a conclusion that uranyl  
21 nitrate was an exposure hazard at Mallinckrodt,  
22 it would certainly be type F. I'm not sure  
23 there's an inconsistency there, it's just that  
24 --

25 **MS. ROBERTSON-DEMERS:** It was a question, why

1 did you choose to use different solubility  
2 classes for the different site profiles.

3 **DR. NETON:** Well, I don't think we did. Now  
4 that's -- Hanford uses type F solubility for  
5 uranyl nitrate.

6 **MS. ROBERTSON-DEMERS:** Right.

7 **DR. NETON:** We're not describing uranyl nitrate  
8 exposures at Mallinckrodt. If we did, they  
9 would be type F.

10 **MS. ROBERTSON-DEMERS:** We'll have to go back  
11 and look at that more closely.

12 **MR. BELL:** Yeah, let's do that. Okay?

13 **DR. NETON:** Yeah, I mean here's the -- here's  
14 your point. In the solubility at Mallinckrodt  
15 we're looking at type M even though type F was  
16 processed. Type M is generally more claimant  
17 favorable than type F. We just did not account  
18 for any exposure to uranyl nitrate in the  
19 Mallinckrodt process. If there were and we're  
20 going to calculate them, we would certainly be  
21 consistent and use type F. That's the default  
22 ICRP.

23 Okay, any other issues, questions on UNH?

24 With that, I think we're sufficiently close to  
25 the lunch hour that we'll take a break, and I'm

1 not going to be able to be here after lunch. I  
2 will come back as soon as I can, but I'll leave  
3 it in the competent hands of LaVon Rutherford,  
4 a/k/a Bomber, to guide the rest of the  
5 conversation and when I come back we'll pick up  
6 where you guys are.

7 (Whereupon, a lunch recess was taken from 12:00  
8 p.m. to 1:40 p.m.)

9 **MR. RUTHERFORD:** All right, let's go ahead and  
10 get started. This is LaVon Rutherford. I'm  
11 going to take over for Jim until he gets back.

#### 12 **DISCUSSION TOPIC 4**

13 I guess we left off at question number four,  
14 and I think you can refer to section 5.2.5, and  
15 I know part of this Janet will -- might want to  
16 pipe in on the -- what's being added to the --  
17 for Rev. 1, but I guess the question was --  
18 really wasn't clear to us exactly what you were  
19 looking for in the -- with respect to the TBD  
20 when it -- you know, for the distribution of  
21 the isotopes and the discussion on the  
22 raffinate and so on.

23 **MR. BELL:** Let me try to explain and then Kathy  
24 maybe can chime in with some stuff that she's  
25 been looking at, as well. But we realize that

1           when you look at the uranium and it gets in the  
2           body, there are daughters developing. And then  
3           when you go into your IMBA setup it will  
4           account for those. Okay?

5           **MR. RUTHERFORD:** Uh-huh.

6           **MR. BELL:** And so that part of it's taken care  
7           of okay. But after you get through that  
8           initial phase, when these things are in the  
9           environment, these daughters are developing  
10          independent of what went on in the body with  
11          uranium. And as they evolve, even though they  
12          are very trace, as you point out, they can get  
13          concentrated and then you could perhaps inhale  
14          those. And there's been a concern that those  
15          trace elements, with a concentrated process,  
16          can sometimes, when inhaled, be of greater  
17          hazard than they were if they were just part of  
18          the uranium daughter process. So and that --  
19          that was kind of where we started in terms of  
20          understanding this better.

21          Kathy, do you want to add a little more to  
22          that?

23          **MS. ROBERTSON-DEMERS:** Well, as you know, when  
24          the raffinate separates -- okay? -- especially  
25          the K-65, you get a lot of radium and you also

1 get thorium 230. Well, obviously the purpose  
2 of the Mallinckrodt plant was to segregate  
3 uranium out. And in the original ore there  
4 were daughter products, and as it went through  
5 this process things like those -- the actinium  
6 and the protactinium and some of those daughter  
7 products would get concentrated.

8 **MR. RUTHERFORD:** With the radium. I mean as  
9 they were --

10 **MS. ROBERTSON-DEMERS:** Right.

11 **MR. RUTHERFORD:** -- separated, yeah. They  
12 maintained their basic distribution as the  
13 radium did at that -- although you would remove  
14 the uranium from it, concentration of that  
15 mirrored basically the concentration that you  
16 would see with the radium.

17 **MS. ROBERTSON-DEMERS:** Well, we're also  
18 concerned about the higher up daughter products  
19 of uranium 235 being separated from the  
20 uranium, and then the higher daughter products  
21 of uranium 238.

22 **MR. RUTHERFORD:** Okay. Okay.

23 **MS. ROBERTSON-DEMERS:** Okay? So now you have a  
24 -- the ratio, the dynamics change --

25 **MR. RUTHERFORD:** Agreed.

1           **MS. ROBERTSON-DEMERS:** -- with respect to...

2           **MR. RUTHERFORD:** Right. And that's where I  
3           thought you were going with it, basically how  
4           we were establishing the ratios or -- or the  
5           distributions of those isotopes and how we were  
6           going to address the internal issues involved  
7           with exposures from that. Now I think --  
8           Janet, have you added or do you want to discuss  
9           anything with that, how we've done, or is it  
10          addressable?

11          **MS. WESTBROOK:** I understand what she's saying,  
12          but I don't see how that's not necessarily  
13          addressed in the --

14          **MR. RUTHERFORD:** That's what I thought you'd --

15          **MS. WESTBROOK:** -- TBD. However, I have to say  
16          -- obviously stuck in my mind is Rev. 1 and not  
17          Rev. 0. Okay? One document that appeared late  
18          on the 0 drive and is in the new Rev. is one  
19          where they actually -- AEC did air sampling and  
20          they were trying to figure out what the uranium  
21          to radium ratio was in different uranium forms.  
22          One of them was in the raffinate waste, the K65  
23          waste area, where they found there was a 100 to  
24          1 ratio of radium to uranium by radioactivity  
25          basis. And then back in the regular dust it

1           was always much -- radium was in the regular --  
2           like ore concentration, in the ore. And in the  
3           intermediate products it might be somewhat in  
4           the middle, but would be depleted and -- it  
5           would be very enhanced in uranium and depleted  
6           in the radium, as you'd expect.  
7           So the first step after they digested it was  
8           the removal of the radium and anything that  
9           went out in that particular precipitation.  
10          Okay? And then they -- they had some  
11          additional precipitations to remove other  
12          mineral -- usually for impurities -- and there  
13          was a little carryover of those daughter  
14          isotopes into there, but that's way lower, so  
15          the K65 would be the worst.  
16          But now once it was drummed -- once it was --  
17          when it was newly formed -- okay? -- you'd have  
18          the radium and the daughter products in the  
19          ratio that they had been basically in the ore.  
20          And once they'd taken the cake off the cloth  
21          and put it in a drum and drummed it, then it  
22          was -- at first it was just stored in a  
23          building, and then they moved the drums --  
24          without opening them up, I guess -- out to --  
25          as far as I could tell, once they'd put it in,

1           sampled it, sealed it up, they didn't open it  
2           again. And then they shipped it out to the  
3           airport.

4           So in connection with the raffinate dust  
5           drifting around in the air, the time for that  
6           would be when they're basically opening up the  
7           filter press because the cloth is full and  
8           they're cleaning the cake off the cloth and  
9           putting the cake in the drums. And then the  
10          stuff wouldn't have been there -- very old past  
11          the time that the ore went into the vat to be  
12          digested. Okay? I mean this would be like  
13          days, a few days at most, I think. And when  
14          they were in full production, I don't know how  
15          fast -- I haven't been able to find this out --  
16          they filled up those cloths. But by the -- by  
17          how many people they needed and how many  
18          presses they had, I suspect it was no more than  
19          a few days, and it might even they have to  
20          change it a couple of times a day. So we  
21          didn't have a big time for the other isotopes  
22          to build up disproportionate I think to what  
23          they had been in the ore. That's my take --  
24          **MS. ROBERTSON-DEMERS:** That's not quite what  
25          we're getting at.

1           **MS. WESTBROOK:** Okay.

2           **MS. ROBERTSON-DEMERS:** Okay? When you received  
3 the ore into the plant -- okay? -- there are  
4 daughter products --

5           **MS. WESTBROOK:** Right.

6           **MS. ROBERTSON-DEMERS:** -- in that ore.

7           **MS. WESTBROOK:** Right.

8           **MS. ROBERTSON-DEMERS:** In some concentration.  
9 Okay? And we're concerned about how those  
10 daughter products get carried through the  
11 process. So you're not decaying into those  
12 daughter products; they're already there.

13          **MS. WESTBROOK:** Okay.

14          **MS. ROBERTSON-DEMERS:** And that's what we're  
15 concerned about. And also there's some dual  
16 processing of the raffinates where they kick  
17 out the waste and then they reprocess it to  
18 just get that last bit of uranium out, so there  
19 is some additional processing steps.

20          **MS. WESTBROOK:** Of the K65?

21          **MS. ROBERTSON-DEMERS:** Of the raffinate in  
22 general.

23          **MS. WESTBROOK:** Well, those other raffinates  
24 were found to be typically very low in uranium  
25 and the daughters because obviously those were

1 moved in other steps, so there was just what  
2 little carryover went into that. Your really  
3 significant ones, from the point of view of  
4 daughters, would be like the K65, and of course  
5 the most significant daughter in that was the  
6 radium.

7 I tried to find out when I was writing the  
8 first TBD whether the thorium came out in that  
9 first step with -- in the K65 with the radium,  
10 or whether it was carried over to a subsequent  
11 raffinate. And my supervisor apparently had  
12 some experience with that from some previous  
13 work, and also the information I was otherwise  
14 able to find indicated that the thorium did go  
15 with -- into the K65 with the raffinate. If  
16 those two went, probably the rest did, as well.  
17 And then any radium that there was in the ore  
18 as it was digested would go out in the bin. So  
19 that's the best I know.

20 And I really think that except for when they  
21 were taking the cakes and various precipitates  
22 off -- and that would have been soon after the  
23 digestion -- they probably were -- it went into  
24 a drum and they weren't handling it thereafter.  
25 So except for some that might get spilled on

1 the floor or whatever, there was not that much  
2 potential for dust to be formed out of those  
3 raffinates. That's what I understand from  
4 looking at the --

5 **MR. RUTHERFORD:** Do you have -- have you seen a  
6 document that supports that actually other  
7 isotopes were carried over in the process?  
8 Because I've never really seen that.

9 **MS. ROBERTSON-DEMERS:** Okay, I have a -- MJW --

10 **MR. RUTHERFORD:** Okay.

11 **MS. ROBERTSON-DEMERS:** -- in their dose  
12 reconstruction process of Mound.

13 **MR. RUTHERFORD:** Yeah, but that's different  
14 now. You've got to look at the processes that  
15 were used at Mound. They did take the  
16 Mallinckrodt -- the Mallinckrodt raffinates and  
17 use the Mallinckrodt, but what their job was to  
18 do was to concentrate the protactinium, and so  
19 there's a big difference there. That process  
20 clearly -- clearly was used to concentrate the  
21 protactinium.

22 **MS. ROBERTSON-DEMERS:** Okay now, time out here.

23 **MR. RUTHERFORD:** Okay.

24 **MS. ROBERTSON-DEMERS:** I didn't say anything  
25 about Mallinckrodt --

1           **MR. RUTHERFORD:** Okay.

2           **MS. ROBERTSON-DEMERS:** -- processing it. The  
3 tie-in is that they took the raffinate and they  
4 recognized that there was actinium and  
5 protactinium and radium in it.

6           **MR. RUTHERFORD:** I agree, and --

7           **MS. ROBERTSON-DEMERS:** And then -- and then  
8 they processed it out.

9           **MR. RUTHERFORD:** Yes, I agree with you.  
10 There's definitely there. I mean that's why  
11 they would use that raffinate in the first  
12 place to pull out the protactinium, because  
13 they knew they had it. And there's no --  
14 nobody here that's going to disagree with you  
15 that it wasn't there. It was there and it was  
16 there in the ratios that were -- that were  
17 established -- of course they -- they built up  
18 differently once it was separated out. But I  
19 think what Janet's pointing to is in the first  
20 process, once it became the raffinate, that  
21 raffinate was basically in the concentrations  
22 that were set up by, you know, the ore itself.  
23 And then after that period, once it -- once the  
24 raffinate became raffinate, it was stored and  
25 it was shipped out later on. So from an

1 exposure hazard standpoint, it's going to have  
2 such a small, small value as compared to the  
3 entire processes that occurred on a daily basis  
4 that it would really make up very little of an  
5 internal exposure hazard as compared to the  
6 uranium exposures.

7 **MS. ROBERTSON-DEMERS:** And I would strongly  
8 suggest that if that's the case, that you state  
9 that.

10 **MR. RUTHERFORD:** Okay.

11 **MS. ROBERTSON-DEMERS:** 'Cause this is, you  
12 know, a contentious issue with the workers.

13 **MR. RUTHERFORD:** It's unclear then. Okay.  
14 Okay. I think we can -- that's --

15 **MR. GRIFFON:** Can I ask -- I came in a little  
16 late on that, but how -- how do you assume that  
17 the concentrations didn't build up in a -- in  
18 the raffinate as opposed to your ore?

19 **MR. RUTHERFORD:** No, I -- we -- I guess I  
20 should say that basically your ore's going to  
21 come in, it's going to have the uranium and --  
22 and its daughters are going to be set up in a  
23 distribution. And certainly as you pull the  
24 uranium out, obviously your concentration index  
25 goes up, but -- but they're still basically in

1 the same distribution -- all the daughters are  
2 in their same distribution and --

3 **MR. GRIFFON:** You mean no end growth -- no time  
4 for end growth. Right? Right, I understand.

5 **MR. RUTHERFORD:** Right, because -- and I think  
6 Janet's point was that -- that the time that --  
7 the reason why it was not, you know, considered  
8 a significant exposure hazard potential was  
9 because of the short time period that the  
10 raffinate was -- one, it was processed. Once  
11 it was processed it was drummed and stored and  
12 then shipped out. And from an exposure hazard  
13 standpoint -- and I agree, actinium's there.  
14 You know, the -- they're there, but from an  
15 exposure time period, it's -- it was a short  
16 time period of potential exposure and a very  
17 discrete period of the process. And when you  
18 look in on a long-term effect, exposure from  
19 the chronic exposure to the uranium, it has  
20 very little potential of contributing a lot to  
21 the internal exposure.

22 **MR. GRIFFON:** Okay. I would just -- I mean I  
23 think I also would support that it's a  
24 contentious issue, so --

25 **MR. RUTHERFORD:** Sure.

1           **MR. GRIFFON:** -- the best you can --

2           **MR. RUTHERFORD:** We should address it.

3           **MR. GRIFFON:** Right, specifically address it  
4           and --

5           **MR. RUTHERFORD:** Right, I agree.

6           **MR. GRIFFON:** -- refute it if -- you know, that  
7           would be good. The other thing I'd want to ask  
8           is is there anything from the Mound site --  
9           they received this materials and they probably  
10          have isotopic characterizations of the  
11          material, but that would be after end growth,  
12          so that would be a problem. Okay.

13          **MR. BELL:** Well, Mound talked about getting --

14          **MR. RUTHERFORD:** Right, but you could always  
15          back-calculate. I mean --

16          **MR. GRIFFON:** The -- the second question I -- I  
17          would have, I'm not sure I -- I'd be ready to  
18          accept the assumption that -- even though I  
19          agree the bagging and then the drumming is  
20          probably the -- the area where you're going to  
21          get your highest exposure potentials, I would  
22          imagine this plant, especially in the early  
23          years, was pretty sloppy in those processes,  
24          and I bet there was a lot of free material out  
25          in those areas and those concentrations would

1           be different in -- if --

2           **MR. RUTHERFORD:** That might be true in the  
3           early, early period. I think one of the  
4           questions -- I think one of the things we've  
5           all read is -- is that the -- if you look at  
6           it, they -- like a lot of the -- I know at  
7           least -- once the Belgian Congo ore got there  
8           that, you know, the ores were required to have  
9           tight -- pretty tight controls over them  
10          because they wanted the radium back and they  
11          wanted the precious metals back. And so there  
12          was a pretty tight control over that material  
13          from that point on. Now, I -- the early period  
14          when the first ores came in, Janet would know  
15          much better than I on any of the discussion on  
16          that.

17          **MR. BELL:** The Mound paper --

18          **MR. GRIFFON:** Well, now that sup-- just that  
19          statement there, that supports your contention,  
20          though, that --

21          **MR. RUTHERFORD:** Right.

22          **MR. GRIFFON:** -- they were concerned about  
23          recovering that so they weren't going to be as  
24          sloppy with that.

25          **MR. BELL:** Just as an example, the Mound paper

1           talks about receiving 48 grams of radium during  
2           a period of June through October of '54, and it  
3           was processed and canned and resulted in 47.5  
4           Curies of radium 226, 14.9 Curies of actinium  
5           227, 24.6 Curies of thorium 228 within that one  
6           year, so it gives you an idea of some of the  
7           things that were coming out of it at that time.  
8           Now again, you know, whether they're exposed to  
9           that potential back in the Mallinckrodt days,  
10          especially in the early period, is something I  
11          need to per-- perhaps be further looked at.

12          **MS. ROBERTSON-DEMERS:** Now can I ask a question  
13          here? With respect to the raffinate, how are  
14          you accounting for the thorium 230 dose?

15          **MS. WESTBROOK:** I'd have to look at the TBD. I  
16          was trying to look at each form that might be  
17          wafting through the air and say here's the  
18          default assumption, dose reconstructor, that  
19          you would make. The text, though, discusses  
20          what might be in each form, especially if it  
21          had had any time to decay or whatever or had  
22          been abraded or whatever. So I can't --  
23          honestly don't remember what I said about the  
24          raffinate, but I believe I did indicate the  
25          fact that, you know, it had these -- the

1 various isotopes that would -- would be in it  
2 and -- and how that would build up over time at  
3 the airport.

4 **MR. RUTHERFORD:** Airport?

5 **MS. WESTBROOK:** The airport. That would be the  
6 St. Louis Municipal Airport, also called the  
7 Robertson site, also called SLAPS.

8 **MR. RUTHERFORD:** I think we did discuss already  
9 that we -- we did say that there was a minimal  
10 exposure period for the raffinate. So I think  
11 -- and we -- we can add some -- add some and  
12 discuss that in detail 'cause you had -- Mark  
13 and you mentioned that's a contentious issue  
14 that we should --

15 **MR. GRIFFON:** Yeah.

16 **MR. RUTHERFORD:** -- we need to address.

17 **MS. WESTBROOK:** Well, I -- this is Janet, and I  
18 just can't remember what I added. I know I  
19 added to the next version of the TBD some more  
20 stuff about the raffinate because more was  
21 known, for example, of the air -- uranium to  
22 radium ratio in the air and so forth, that --  
23 that was all very important information.

24 **MR. RUTHERFORD:** I'm sorry, LaVon Rutherford  
25 again. And you remember, too, not -- the

1 raffinate, especially once they started  
2 processing the Belgian Congo ore, that was not  
3 something that was going to be routinely open  
4 and exposed to because not only -- once they  
5 started doing the radon sampling and the --  
6 they got the film -- film badges really started  
7 -- got the external monitoring program in, you  
8 know, they clearly seen that the external  
9 exposures were way up and the radon  
10 concentrations were out of the worl-- out of  
11 this world be-- so they had to address  
12 potential exposures to the raffinate. And it's  
13 clear from the discussions they talked about on  
14 how they tried to store it and how they tried  
15 to store the drums of raffinate and -- and  
16 shielded areas and tried to have minimized the  
17 potential for workers to get to those areas.  
18 So clearly once the raffinate -- especially  
19 once the Belgian Congo ore was proc--  
20 processed, they had tighter controls on -- on  
21 that material from it being open and exposure  
22 from an internal standpoint.  
23 Now I -- I mean it's clear from the film badges  
24 that there were also some very high external  
25 exposures from those, so...

1           **MR. FLEMING:** This -- this is Kenny. I've got  
2 a copy of your latest TBD. It's about the  
3 August, 2004 and in section 6-1 you sort of  
4 describe that, I think, for source materials  
5 with uranium isotopes that are -- predominate,  
6 as well as the ones with radium that  
7 predominated, and you have some isotopic  
8 distributions for thorium 230 and radium 226  
9 and thorium 232 and --

10          **MS. WESTBROOK:** Thanks for reminding me of it.  
11 You know, I was trying to review it and I must  
12 have missed that part.

13          **MR. FLEMING:** They don't have that, I don't  
14 think, you know, so --

15          **MS. WESTBROOK:** I know they don't, but -- but,  
16 you know, I missed noticing it. Thank you.

17          **MR. FLEMING:** But it's in section 6, when --  
18 when you get a copy of it. It has something  
19 that she's --

20          **MR. BELL:** That will be very helpful.

21          **MS. WESTBROOK:** Look in your crystal ball.

22          **MR. RUTHERFORD:** I knew Janet said she'd -- she  
23 had put some more information in there. I  
24 guess my question on this section itself, you  
25 know, and I think we -- we have addressed the

1 issue, but is I was trying to understand and  
2 now I at least partially understand. I was  
3 trying to understand why the discussion on  
4 Mound went in here because I was -- my point  
5 when I looked at that was well, yeah, they were  
6 -- they were concentrating those isotopes for a  
7 reason, you know. And I guess maybe the  
8 clarification would be -- would be that we know  
9 Mallinckrodt had this material because --  
10 because Mound --

11 **MS. ROBERTSON-DEMERS:** Mound received it.

12 **MR. RUTHERFORD:** Yes, Mound received it and  
13 processed it to --

14 **MR. BELL:** And they found that in there.

15 Right? The question is, was it concentrated in  
16 some way back at Mallinckrodt during some of  
17 these processes, not that they had a potential  
18 for inhalation.

19 **MR. FITZGERALD:** Sounds like you need to just  
20 clarify that a little bit.

21 **MR. RUTHERFORD:** Yeah.

22 **MS. WESTBROOK:** This is Janet. There was some  
23 residue that they did process. That was the  
24 thorium processing --

25 **MS. ROBERTSON-DEMERS:** Right.

1           **MS. WESTBROOK:** -- that they did --

2           **MS. ROBERTSON-DEMERS:** Yeah.

3           **MS. WESTBROOK:** -- but that was different from  
4 the K65 residue.

5           **MR. RUTHERFORD:** The actual thorium processing,  
6 if I remember correctly, too, was 1955?

7           **MS. WESTBROOK:** Yeah, that was the AM7.

8           **MR. RUTHERFORD:** Yeah, and that was '55 to '57  
9 and it was done on a pilot scale and --

10          **MS. WESTBROOK:** Handful of workers.

11          **MR. RUTHERFORD:** -- handful of workers and a  
12 controlled environment -- very controlled  
13 environment. And that -- that kind of lent to  
14 another issue because there was discussion  
15 about the work in Weldon Springs that was done  
16 later on, and in the SC&A report, which was  
17 done at a production scale and it was -- if I  
18 remember correctly, and correct me if I'm wrong  
19 -- the work that was done at Mallinckrodt was  
20 done pilot scale and it was done in a liq-- in  
21 a wet --

22          **MS. WESTBROOK:** Entirely liquid and shipped off  
23 in a liquid form, yes.

24          **MR. RUTHERFORD:** -- liquid form. And so as a  
25 comparison from an internal exposure

1           standpoint, the pilot scale, liquid form and  
2           the very controlled environment that was done  
3           at Mallinckrodt versus the production years --  
4           'cause there -- there are specific -- in that  
5           SC&A report there are specific concentration  
6           comparisons that are made, from a dust  
7           standpoint, from the '55 to '57 -- or '55  
8           period at Mallinckrodt versus the -- the Weldon  
9           Springs data at a full scale production scale  
10          at a dry period that -- that, to me, are not --  
11          they're apples and oranges.

12          **MR. BELL:** This is Tom. I think all we were  
13          trying to say is that there -- the potential  
14          exist in both periods, and when you look at the  
15          holistic individual, eventually you're doing  
16          your dose reconstruction, you shouldn't --  
17          shouldn't neglect the fact that there's that  
18          potential later at Weldon Springs.

19          **MR. RUTHERFORD:** Oh, agreed -- agreed with  
20          that.

21          **MR. BELL:** I think that was the main point, and  
22          it's not our job to do Weldon Springs early,  
23          but it was kind of oh, by the way, so I mean  
24          it's not really a finding, but --

25          **MR. RUTHERFORD:** And I totally agree with that.

1 I guess my only issue was the fact that we were  
2 comparing numbers, and I didn't really feel  
3 like the number comparison should -- should be  
4 there because they're different processes and  
5 different -- and it didn't -- they didn't match  
6 up. Okay?

7 **MR. FITZGERALD:** Well, again, maybe for  
8 clarification's sake, we should just come out  
9 and say that.

10 **MR. RUTHERFORD:** Yes.

11 **MR. FITZGERALD:** That we acknowledge that issue  
12 and we're presenting it for a different reason,  
13 just to make sure that the reader -- if you --  
14 if you walked away with that misunderstanding,  
15 others will, too, so I think we just need to  
16 clarify that.

17 **MR. RUTHERFORD:** I appreciate that.

18 **MR. GRIFFON:** Can -- I've got a question, just  
19 -- I don't know if we're even allowed to delve  
20 into this area, but what -- I'm just curious  
21 what the dose consequences -- what the  
22 difference in dose consequence would be if say  
23 you assumed a person were doing that bag  
24 change-out operation for one year out of their  
25 -- as opposed to -- to the normal average one

1 year in this -- in the plant. You know, mostly  
2 uranium dose versus this -- the concentrations  
3 you just referred to in that new table that's  
4 coming with -- what -- what are the dose  
5 differences? What are the --

6 **MR. RUTHERFORD:** Well, they can be significant  
7 for different isotopes.

8 **MR. GRIFFON:** Yeah.

9 **MR. RUTHERFORD:** You know, obviously thorium  
10 230 --

11 **MR. GRIFFON:** Right.

12 **MR. RUTHERFORD:** -- is significant. Actinium  
13 is another one. So if you -- you know, I mean  
14 if you --

15 **MR. GRIFFON:** Well, let me give you the --

16 **MR. RUTHERFORD:** -- compared them one to one,  
17 you're -- I mean --

18 **MR. GRIFFON:** Let me get at this a different  
19 way then. Maybe --

20 **MR. RUTHERFORD:** Okay.

21 **MR. GRIFFON:** -- how much do -- did you compare  
22 the concentrations of the incoming ore versus  
23 that of the raffinate in that table that you  
24 referenced? Are the two compared?

25 **MR. FLEMING:** I have no idea.

1           **MR. GRIFFON:** To the -- to the concentrate--  
2           you know, a factor of 100, a factor of a thou--  
3           I'm just trying to get a han-- I guess we'll  
4           have to wait till that document comes out.

5           **MS. WESTBROOK:** Yeah, I'm sorry.

6           **MR. GRIFFON:** 'Cause the only -- I mean the  
7           only other -- I tend to agree with your  
8           assessment of the opportunities for exposure  
9           there probably being limited, but you also have  
10          probable maintenance activities in those kinds  
11          of operations. And I'm slightly familiar with  
12          this kind of stuff and those -- those things  
13          are usually messy to -- to maintain. I don't  
14          know, I'm not familiar with this particular  
15          operation. But there -- there's another  
16          opportunity to get intermittent higher  
17          exposures, you know. So I think if it's  
18          addressed -- I don't -- I don't think I'm ready  
19          to just say all right, I think we're covered  
20          with the uranium distribution, let's forget  
21          about the raffinates. I think -- and I don't  
22          think you are, either. I think you're  
23          addressing them. So as long as we cover those  
24          bases, I think...

25          **MS. WESTBROOK:** We did recognize that there was

1 a need -- especially when we have more  
2 information, we can do this --

3 **MR. GRIFFON:** Right.

4 **MS. WESTBROOK:** -- to more fully discuss the  
5 different forms and their radioactive content.

6 **MR. FITZGERALD:** It sounds like the bottom line  
7 to that issue, so if we can leave it at that,  
8 that probably describes where we are.

9 **MR. RUTHERFORD:** Yeah, it sounds like we're  
10 going to address part of your issue that you  
11 had and so that's -- that's great.

12 **DISCUSSION TOPIC 5**

13 Okay, I'm trying to remember this one myself.  
14 Number 5, NIOSH would like to discuss the issue  
15 identified in 5.2.1 and 5.5 questioning  
16 applicability of the air sampling data. I have  
17 to -- I have to think here for a second. I  
18 believe 5.2.1 and 5.5 address breathing zone,  
19 if I remember correctly.

20 **MR. BELL:** Well, on air sampling data and  
21 general air concentration data.

22 **MR. RUTHERFORD:** Hold on.

23 **MR. BELL:** The use of ICRP-75-related issues,  
24 which actually was covered in the Bethlehem  
25 Steel --

1           **MR. RUTHERFORD:** Oh, okay.

2           **MS. ROBERTSON-DEMERS:** Yeah, I think we talked  
3 a little bit about this this morning.

4           **MR. RUTHERFORD:** We've already talked about  
5 this one.

6           **MR. BELL:** Performance issue, yeah.

7           **MR. RUTHERFORD:** Yeah, this was -- this one --  
8 unless someone else has more to discuss with  
9 that, I don't really feel like I need to  
10 discuss any more. Anybody? Okay. Let's go  
11 on.

12 See, we are already moving quicker.

13           **MR. BELL:** Tom. I just wanted to add, in the  
14 5.5 section there's a whole list of variables  
15 that might have an impact on higher  
16 concentration data -- I just don't see the TBD  
17 mentioning that there is this wide variability  
18 in kinds of things, and I think it needs some  
19 discussion. I know that you don't have all the  
20 answers and it's not always available, but it  
21 just kind of implies that the air concentration  
22 data's valid and there's no problem with it,  
23 where I think there are a number of things that  
24 went into that that sort of make it a little  
25 suspect and need to be addressed a little bit

1 just so people understand it better.

2 **MS. ROBERTSON-DEMERS:** This is Kathy. Have you  
3 guys done any analysis of the possible errors  
4 associated with those air samples?

5 **MR. RUTHERFORD:** I know I haven't, and I'll let  
6 Janet, if she has anything to add.

7 **MS. WESTBROOK:** Well, the reason you don't see  
8 any uncertainties there is because initially  
9 nobody told me to put in uncertainties. And  
10 then as I was dealing with the other data, bit  
11 by bit we put in the uncertainties. Okay? The  
12 reason that didn't have the uncertainties back  
13 inserted, even in Rev. 1, is that supposedly --  
14 I don't know, NIOSH, the project, somebody,  
15 this is way over my head, just "they" up there  
16 -- were going to -- because these were standard  
17 AEC measurements and we didn't usually have any  
18 uncertainties attributed to them at all,  
19 although oftentimes they were multiple measur--  
20 based on multiple measurements, somebody was  
21 going to take up this issue on a kind of  
22 generic, AEC-wide basis. At least this part of  
23 AEC was all doing it in a standard way. And in  
24 fact AEC itself was toting its instruments. I  
25 think they got on the train with all their

1 instruments and zipped off to the various sites  
2 and took hundreds, often -- maybe even  
3 thousands, 'cause I've seen them numbered up  
4 into the 2,000-and-something for a single dust  
5 study -- take them off to the site and take  
6 these numbers. So my thinking was either that  
7 if the project or NIOSH or whoever actually  
8 does come up with those generic numbers, those  
9 will be conservative default uncertainties that  
10 we can use, and we can compare them to what's  
11 known about Mallinckrodt and see if any  
12 additional uncertainties should be introduced.  
13 Mallinckrodt, as you know, took its own air  
14 sampling measurements in between the AEC's  
15 annual or bi-- twice-annual dust studies,  
16 depending on where they -- you know, what was a  
17 problem at the time, and there's some  
18 Mallinckrodt studies in between there.  
19 That's why we had so much data on Mallinckrodt,  
20 because Mallinckrodt had people who were  
21 qualified to do that. And their results seem  
22 to be -- I think, no matter what we might say  
23 about this later, my first idea is that they're  
24 pretty consistent. And the reason was, they  
25 used consistent methods. Mallinckrodt had to

1 show that they could do it consistent with the  
2 way AEC was doing it, and it had the same level  
3 of instrumentation and so forth.

4 And so I think we'll be able to come up with  
5 those uncertainties, but that -- you know, I  
6 mean no excuses, you're right, nailed us on  
7 that one. There aren't any uncertainties  
8 there, mainly because that's a hole waiting to  
9 be filled.

10 **MR. RUTHERFORD:** And I -- this is LaVon  
11 Rutherford. I think Jim addressed that earlier  
12 when he said that that is one thing that we  
13 plan on doing is adding an actual separate TIB  
14 or whatever that will address the actual  
15 uncertainties in the air sampling from, you  
16 know, over the -- those periods.  
17 Some of the things, though, are -- I mean --  
18 and we'll get onto this later in question  
19 number eight, I believe, but I mean from a --  
20 from -- the time-weighted average is not --  
21 it's a -- is a good way of actually doing -- I  
22 mean if you look at what the -- the approach in  
23 developing a time-weighted average -- from a  
24 chronic exposure standpoint over a period of  
25 time, that's a -- that's an excellent way of

1 measuring a person's, you know, intake or  
2 suspected intake over a given -- given period  
3 of time. It's a very good -- good method. And  
4 I think that was one of the things Jim was  
5 discussing earlier and what -- we'll get to  
6 that a little later.

7 **MR. BELL:** Before you leave that topic --

8 **MR. RUTHERFORD:** Okay.

9 **MR. BELL:** This is Tom -- I had a question  
10 regarding the table 12 that dealt with those  
11 figures and comparisons. We were just looking  
12 at it, it's something I hadn't caught until  
13 recently, we were just talking about it at  
14 lunch. We're a little concerned maybe there  
15 was a correction the wrong way in the table,  
16 Janet. I -- you can help us with this. Maybe  
17 we just don't understand it properly. But  
18 there are two columns here, one in micrograms  
19 per cubic meter and one in adjusted  
20 deparameter\* cubic meter, and the bottom  
21 footnote tells us that you have to adjust not  
22 only for the 70 microgram -- deparameter per  
23 meter cubed per 50 milligrams per meter cubed  
24 in getting that figure, but also you have to  
25 take in the fact that it went from six days a

1 week to five days a week. And what we were  
2 looking at was if you take the two -- the 2,390  
3 micrograms per cubic meter, let's say for the  
4 operator A up there at the top of the table,  
5 and you -- and you multiply it by seven-fifths,  
6 it seems to me we'd come out with 3,346, and  
7 then if you take that times six over five to  
8 account for fewer days, we came out with 4,015,  
9 whereas the table here would be 1,990. Are we  
10 going in the wrong direction on this? We just  
11 didn't know how to interpret that.

12 **MS. WESTBROOK:** When it -- that -- in a review  
13 by another TBD person, and I can't remember if  
14 it was changed or not -- is this the -- this is  
15 -- we talked it over, and I forget whether I  
16 had to change it or not. Either it has been  
17 changed or it was demonstrated to a peer's  
18 satisfaction that that was correct.

19 **MR. BELL:** Can I just ask that you look at that  
20 again and make sure your correction --

21 **MS. WESTBROOK:** Yeah.

22 **MR. BELL:** -- went the right direction?

23 **MR. GRIFFON:** Yeah, make sure the calculation -  
24 -

25 **MR. BELL:** We're just concerned maybe they made

1 a mistake and went the wrong way.

2 **MS. WESTBROOK:** Is that table 12?

3 **MR. BELL:** Table 12, yeah, the comparison  
4 between the micrograms per cubic meter versus  
5 the adjusted deparameter per cubic meter,  
6 whether your corrections went the right  
7 direction on that. Again, that's not a  
8 finding, it's just something to help --

9 **MR. GRIFFON:** Yeah.

10 **MR. BELL:** -- make sure the table works better  
11 for you.

12 **MR. RUTHERFORD:** Okay. Shall we move on?

13 **MR. BELL:** Yes.

14 **MR. RUTHERFORD:** If -- we're going to hold  
15 number six until Jim gets back. That's --

16 **MR. BELL:** That's one of his favorites. Right?

17 **MR. RUTHERFORD:** And I'm not sidestepping the  
18 issue. Okay?

19 **MR. BELL:** No, that's okay. That's  
20 understandable.

21 **DISCUSSION TOPIC 7**

22 **MR. RUTHERFORD:** Number 7, NIOSH would like to  
23 discuss finding four that questions the use of  
24 coworker data. I have to go back...

25 (Pause)

1           Okay, here it is.

2           **MS. WESTBROOK:** Is that 41?

3           **MR. RUTHERFORD:** Excuse me? Yeah, page 41.

4           There's a statement in there that says  
5           (reading) At the present time and at the  
6           present state of analysis, it is questionable  
7           whether coworker data can be used to deny  
8           claims.

9           And we -- we would -- we would either like that  
10          to be clarified or we'd like to understand why  
11          you make that statement.

12          **MR. BELL:** Well, let me see if I can explain it  
13          for you.

14          **MR. RUTHERFORD:** Okay.

15          **MR. BELL:** Coworker data, from my understanding  
16          of all that I've seen on your database, is data  
17          that begins to really become evident a little  
18          later on -- '47, '48, maybe you're finding some  
19          in '46, but not a whole lot -- and yet it's  
20          extrapolated back for use for everybody.

21          **MR. RUTHERFORD:** Uh-huh.

22          **MR. BELL:** And there's not a clear methodology  
23          -- perhaps your dose reconstructors know how to  
24          use it, but there's not a clear discussion of  
25          how to -- and there is some discussion, I'm not

1 saying it wasn't addressed.

2 **MR. RUTHERFORD:** How it should be applied.

3 **MR. BELL:** But how best do you apply it, and  
4 how do you take an average -- this is kind of  
5 like an average process of coworker's data, I  
6 suppose -- how did we get to that, first off.  
7 I mean what was used to come to those figures.  
8 And secondly, how well does that cover these  
9 high-risk category people, particularly in the  
10 early years when we don't have much data. And  
11 that's a difficult question, I understand. But  
12 it just seems to me that to say oh, I used  
13 coworker data, when maybe it doesn't exist in a  
14 lot of cases, to handle that problem may not be  
15 sufficient enough -- I mean without some kind  
16 of back calculation or some other technique to  
17 validate it. And that was kind of the concern  
18 we had about that.

19 You want to add, Kathy, to that at all or --  
20 that pretty much state it?

21 **MS. ROBERTSON-DEMERS:** Pretty much.

22 **MR. BELL:** So I mean that's where we were  
23 coming from. We think -- we think if we're  
24 going to rely solely on that as the way you get  
25 a person's dose, the individual -- and I'm

1           thinking more of the worker and people looking  
2           at this -- explain to me, the worker, how you  
3           got that to be my dose because I worked in an  
4           area much higher than that, you know, and you  
5           didn't take that into account. And so there's  
6           got to be -- I think if -- if we get into some  
7           of these other areas we've been talking about  
8           where you begin to use maybe 95 percent of some  
9           high risk categories, that may take part of the  
10          problem away. But I think as it is right now,  
11          it seems a little weak in the way it's  
12          described and how it's used, and we're not sure  
13          the dose reconstructor is really getting the  
14          full benefit of that, either.

15          **MR. RUTHERFORD:** And I respect that, and I  
16          think that we all agree that -- you know, Jim  
17          has already discussed about using 95 percent  
18          confidence level. I would -- I think what we'd  
19          like to -- that to be restated, if -- you know,  
20          and basically that the -- the approach -- or  
21          the -- either, you know, the approach used --  
22          identified in the TBD for using coworker data  
23          needs to be re-evaluated for its -- you know,  
24          to address the potential for higher exposures  
25          or certain categories or something, you know,

1           because I don't think -- I don't think you can  
2           -- I mean -- come out and say that we can't --  
3           we can't deny claims based on coworker data,  
4           because some we clearly can. I think there's  
5           some that -- some that -- you've brought up a  
6           point that I think, you know, yeah, we need to  
7           address. But I just think it would be better  
8           if it was restated in a manner that -- that --

9           **MR. FITZGERALD:** Yeah, this strikes me as  
10          similar to the other issue of --

11          **MR. RUTHERFORD:** Yes, it is.

12          **MR. FITZGERALD:** -- presentation and not --  
13          this is sort of like not leading the witness.  
14          We can't certainly say it in those terms. It's  
15          your prerogative, it's Labor's prerogative. I  
16          think we can certainly address the question of  
17          adequacy of information or the basis for that  
18          judgment, but that's as far as we go.

19          **MR. RUTHERFORD:** Right.

20          **MR. FITZGERALD:** Now I'll also add, though,  
21          that the site profiles of course get into  
22          application questions, sort of -- not just  
23          simply presenting what information's out there,  
24          but going a little bit further in terms of how  
25          information ought to be applied. So in those

1 issues we're going to be dealing with  
2 application questions, so --

3 **MR. RUTHERFORD:** I understand.

4 **MR. FITZGERALD:** -- we'll have to come up with  
5 some way to do that.

6 **MS. ROBERTSON-DEMERS:** Can I ask a general  
7 question?

8 **MR. RUTHERFORD:** Yeah.

9 **MS. ROBERTSON-DEMERS:** What exactly is your  
10 definition of a coworker?

11 **MR. RUTHERFORD:** Well, my definition of a  
12 coworker -- and -- or I can let Janet answer  
13 from the -- from the site profile that -- how  
14 the data's used, but my definition of a  
15 coworker would be cowork-- individuals that  
16 work in the same general job description as  
17 another individual, and those individuals can  
18 be grouped -- I mean it may not be that you  
19 have every job broken down to -- but you may be  
20 able to group jobs that -- based on data that  
21 you've received, that -- the data that you've  
22 reviewed, the individuals that typically fall  
23 within these classes, we've found a range --  
24 the data range from here to here and we've set  
25 up distributions appropriate for that at -- you

1 know, and so you may have groups, or you may  
2 actually have every job broken down, you know,  
3 to that level. It just depends on what data  
4 you have and -- and how much you -- how much  
5 time and effort you want to go to to get to  
6 that point.

7 **MR. BELL:** This is Tom. I'd just ask a  
8 question -- you've mentioned something, they  
9 can be grouped perhaps with ranges. I think  
10 that'd be very helpful if -- if that kind of  
11 data in general were given. I mean I don't if  
12 you can do it, Janet, but if -- if there's some  
13 groups where the coworker data was considerably  
14 higher, and you're looking at a dose  
15 reconstruction for somebody in those specific  
16 type of things, then the ranges of dose in that  
17 kind of job category would be very interesting  
18 for what the ranges are like in terms of even  
19 thinking of a 95 percentile thing. I don't  
20 know whether you can get to it or not, but I'm  
21 saying that's -- that's where some of the  
22 confusion lies here, is an understanding of how  
23 -- how you apply that coworker data in a way  
24 that's realistic for an individual who's doing  
25 something beyond the norm. Okay?

1           **MS. WESTBROOK:** Realistic.

2           **MS. MUNN:** Uh-huh, realistic.

3           **MS. WESTBROOK:** Let's let that word sink in a  
4           little bit -- realistic. One problem we have  
5           is that we're kind of limited in what we  
6           practically can do. We can't do a tailored  
7           dose reconstruction for every individual where  
8           his specific, individual circumstances are  
9           considered down to a gnat's eye. So you asked  
10          about the coworker data. Using the coworker  
11          data is -- I'm sure everybody agrees that this  
12          is a way to go when maybe he has some missing  
13          data or what he did was uncertain, or just for  
14          some reason his urinalysis results are a little  
15          inconsistent, maybe they got contaminated. So  
16          you might look at the coworker data to see  
17          well, what were other people, doing his same  
18          job at the same time, getting. And that  
19          wouldn't always replace his data, but it could  
20          inform it. And if he doesn't have any data,  
21          that would be the data. And I think that's a  
22          reasonable and realistic thing to do. I also  
23          think it's fair, in terms of being claimant  
24          favorable.  
25          And when you say a range, I don't get that.

1           Because if you look at the intakes table -- I  
2           think that's table 31 -- well, it gives you --  
3           it gives you the number and it gives you a GSD,  
4           which those have been corrected and that was a  
5           numerical -- that was an error in the Excel  
6           spreadsheet. So anyway, that's been corrected.  
7           So you basically do have an implied  
8           distribution and range, so -- I mean and an  
9           uncertainty, so I don't see what -- somebody's  
10          going to have to explain it to me. I'm sure my  
11          supervisor was real (unintelligible) statistic  
12          scan, but otherwise I don't understand.

13          **MR. BELL:** Well, there's --

14          **MS. WESTBROOK:** To produce that table -- let me  
15          just explain one thing. To produce that table  
16          31, I looked at the data that Mancuso\* had  
17          originally computerized, that urinalysis data,  
18          and then ORAU checked it and, you know, vetted  
19          it and Dr. Ellis told me she thought that it  
20          was a very sound set.

21          Now it doesn't include women or black people,  
22          and it doesn't include all the white males that  
23          worked there. If -- if somebody had some kind  
24          of unusual medical condition, I think they  
25          ruled them out, but this is really the bulk of

1           the Mallinckrodt process workers that that  
2           dataset includes.  
3           Now in the urinalysis they always put a note to  
4           say what group he was working in or what kind  
5           of task he was working in. Okay? So it was --  
6           it was -- I found it fairly easy, from the one  
7           or two or three key words they had in there, to  
8           figure out what work group he was in by job  
9           title, because they were pretty consistent with  
10          their job title. So with respect to what work  
11          group is he in, I classified them into broad  
12          groupings -- raffinate workers, and those would  
13          be the guys who did the cake scraping and so  
14          forth; the pot workers and so forth, whatever  
15          the category is that you see there.  
16          One reason I had those categories -- some could  
17          have been broken down a little more except that  
18          I was trying to have ten or more workers in a  
19          group, if I could. And for kind of minor ones,  
20          at least three. So I grouped them into larger,  
21          related categories. But normally I didn't have  
22          to do that. They were pretty well sorted out  
23          into those categories, and I manually went and  
24          cut and pasted all the different blocks and the  
25          different people into their correct times.

1           And because they seemed to break down into two  
2           different year groupings, I -- what you'll see  
3           there is like time group one, time group two  
4           and then time group three being the entire  
5           span. And that -- that helped, because some  
6           people would change jobs. I did not include  
7           relatively few people who seemed to job-hop.  
8           Okay?

9           But in the instructions to the -- but the  
10          others are pretty consistent that they would  
11          stay pretty much always at that job in that  
12          range.

13          But in the instructions to the dose  
14          reconstructors, and I think this has been  
15          strengthened in the new TBD, I tried to tell  
16          them what to do. Now suppose a guy was a pot  
17          worker one year, as shown by his urinalyses or  
18          his employment record or what -- or his film  
19          badging, and then the next year he's a  
20          raffinate worker. Well, you'd use the pot  
21          worker intake, 'cause these were based on  
22          urinalyses for one year, and the pot for the  
23          next year. But the dose reconstructor's given  
24          the leeway to make a maximizing assumption,  
25          like to use whichever is the worst, because as

1 we know, the urinalysis is kind of -- goes over  
2 from year to year. I mean it isn't like  
3 external dose. You know, the film badge is  
4 this period and this period only.  
5 So that I just had to leave to the discretion  
6 of the dose reconstructor. That, to me, is a  
7 very individual thing that he will have to look  
8 at on a case by case basis. So I think these  
9 are pretty conservative 'cause they're based on  
10 actual data and they give the GSDs. We can  
11 always use something real high in the range if  
12 you want to. But the dose reconstructor does  
13 have the option, looking at the guy's  
14 employment record, to either pick what would  
15 maximize his dose all through the period as --  
16 in terms of intake, or what -- alternatively,  
17 what would minimize it, if you're -- he's  
18 checking something out there. But that --  
19 that's the best compromise that I could make.  
20 Now, I don't necessarily think that was the  
21 best that could be done, although both my  
22 supervisors -- up until one left and then the  
23 oth-- they -- they both seemed to agree with  
24 that approach. However, if you guys have  
25 something maybe more -- I don't know, more

1 favorable to suggest, please -- I would --  
2 'cause --

3 **MR. BELL:** This is Tom --

4 **MS. WESTBROOK:** -- we've got --

5 **MR. BELL:** -- could I ask another question --

6 **MS. WESTBROOK:** -- the data. It's already  
7 computerized now. We know this is all  
8 computerized. We could do this again.

9 **MR. BELL:** I guess my -- my problem is, I don't  
10 understand the data you used to create all of  
11 this.

12 **MS. WESTBROOK:** Yes.

13 **MR. BELL:** What I'm beginning to hear now is  
14 that you took all the urinalysis data you had  
15 and you -- you grouped it. Is that correct?

16 **MS. WESTBROOK:** Yes.

17 **MR. BELL:** And that was all computerized in  
18 some way by the epidemiologist or --

19 **MS. WESTBROOK:** I had to hand group it, but --

20 **MR. BELL:** You had to hand group it.

21 **MS. WESTBROOK:** -- the data was already  
22 entered. I didn't --

23 **MR. BELL:** So you took all that infor-- okay,  
24 that doesn't come across very clearly on how  
25 this was derived. I think that's one problem.

1           Okay? The second problem I still have with the  
2           table is that when you get to period one, it  
3           deals with '48 to '51, and yet it's -- has to  
4           be used for anybody earlier, and there wasn't  
5           really any coworker data earlier. And so how  
6           do we know for sure that it's giving those  
7           people a fair shake?

8           **MS. WESTBROOK:** Well, because you're going to  
9           use --

10          **MR. BELL:** And you know, unless you back-  
11          extrapolate it.

12          **MS. WESTBROOK:** You're going to use their own  
13          urinalysis data first. That's --

14          **MR. BELL:** Oh, of course, yeah.

15          **MS. WESTBROOK:** Okay. So therefore that would  
16          give them a fair shake if it's their own data.  
17          The coworker data's only for people with  
18          missing data. And again, you could go in the  
19          up side of the range and you'd still -- I mean  
20          if you go to the up side of the -- you know,  
21          the top GSD or --

22          **MR. BELL:** But does the dose reconstructor use  
23          the upper range of the GSD or not?

24          **MS. WESTBROOK:** That's not --

25          **MR. BELL:** Well, I mean it's --

1           **MS. WESTBROOK:** -- stated in the TBD because --

2           **MR. BELL:** -- I think it --

3           **MS. WESTBROOK:** -- that's a generic --

4           **MR. BELL:** -- should be --

5           **MS. WESTBROOK:** No, that's a generic -- no, no,  
6           that's in the dose reconstructor's own

7           procedures and NIOSH's directions to the dose

8           recon-- see, that's a generic issue, 'cause

9           they're going to -- they might do it the same

10          for every site, so what -- what's basically the

11          same for every site doesn't go necessarily into

12          the TBD, or what's left, again, to the

13          discretion of the dose reconstructor.

14          I can't emphasize that enough. We started out

15          to where we were going to be the ones to

16          tabulate the film badge data or somebody was

17          with us, and we were going to analyze it and

18          come up with a coworker table, and -- and I was

19          directed to do that, came up with a coworker

20          intakes table, and then we were told no, other

21          tasks are doing this that are more expert in

22          this area or whatever 'cause, you know,

23          otherwise we'd have to be the renaissance HP to

24          do all this. So that's a holdover for what I

25          did, but so far nobody's suggested taking it

1 out, and I -- because I don't think it's a bad  
2 approach. But again, if the generic, NIOSH-  
3 approved approach eventually is better, then  
4 that will be replaced.

5 **MR. BELL:** I don't think anybody's saying  
6 coworker data isn't valid if you can use it  
7 properly. All we're trying to say is it's not  
8 real clear, number one, that you derived it  
9 from all this hand-input urinalysis data. I  
10 didn't understand that reading of it. And  
11 secondly, I'm still concerned that it's being  
12 used for people in the early days when there  
13 really is no coworker data to validate it. And  
14 without saying that. Okay? And then -- then  
15 the worker who knows that he got higher doses  
16 than most everybody else is going to say but  
17 these standard averages don't apply to me. And  
18 the question is how do you deal with that  
19 issue, and it's a tough one, I know. It's not  
20 easily solvable.

21 **MR. RUTHERFORD:** Well, I think -- right. I  
22 think Jim -- this is LaVon again. I think Jim  
23 discussed that leaning towards the 95 percent  
24 confidence level on the data -- he did on the  
25 coworker data, we did discuss that. And again

1 I would say that if you look from the '46 to --  
2 I agree with you, there are question marks '42  
3 to '45, plant ones, plant two workers that  
4 worked in those -- that period back when the  
5 manual processes and -- again, I agree with you  
6 there. But I will say that the '46 to '48 time  
7 period, I think we have the data. I think we  
8 have enough data that the coworker data can be  
9 used from that period.

10 **MR. BELL:** But urinalysis didn't start till  
11 '48. Correct?

12 **MR. RUTHERFORD:** '48 -- urinalysis didn't  
13 start, I agree with that, but we have  
14 urinalysis one who workers -- not -- urinalysis  
15 -- something that we do have is from workers  
16 that worked back in the earlier period in some  
17 high-risk jobs that can be used to back -- go  
18 back to '46 and '47.

19 **MR. BELL:** Did you back-calculate those?

20 **MR. RUTHERFORD:** We have -- I haven't done that  
21 yet, but we have that data to do that. Again,  
22 we also have radon data. We also have external  
23 monitoring data. We have some dust sampling  
24 data that we can actually use and -- and  
25 comparison. From a worker standpoint we can

1           compare dust exposure data from '48 time period  
2           to urinalysis -- urinalysis data and -- and  
3           even from later years to see if there is  
4           comparisons. I ag-- again, I recognize that we  
5           have controls implemented that are going to  
6           change those data, but the workers are doing  
7           the same job and my point is is that we have  
8           data from '48 prior to those controls being  
9           implemented that we can do some comparisons to.

10       **MR. BELL:** Could the TBD explain that you'll be  
11       doing those kinds of steps? I mean that's all  
12       I'm saying.

13       **MR. FITZGERALD:** Well, I think -- are you  
14       suggesting that the ongoing Rev. 1 development  
15       is likely to both address the 95 percentile, as  
16       well as clarify --

17       **MR. RUTHERFORD:** I -- yes.

18       **MR. FITZGERALD:** -- this next --

19               **MR. RUTHERFORD:** Yes.

20       **MR. FITZGERALD:** Okay. 'Cause it sounds like  
21       it really accommodates a lot of the issues  
22       you're talking about.

23       **MR. BELL:** If that'll do that, then we're in  
24       good shape.

25       **MR. RUTHERFORD:** Hopefully it'll get --

1           **MR. FITZGERALD:** Although it does sound  
2           like there's still some thinking going  
3           on relative to --

4           **MR. RUTHERFORD:** Yeah, and that's --  
5           that's Jim's discussion.

6           **MR. FITZGERALD:** It's an option. It sounds  
7           like it's a --

8           **MR. RUTHERFORD:** Right, and it -- it sounds  
9           like -- I mean obviously Jim had discussed that  
10          earlier.

11          **MR. FITZGERALD:** Right.

12          **MR. RUTHERFORD:** The issue's more of do we want  
13          to globally do this on coworker data --

14          **MR. FITZGERALD:** Right.

15          **MR. RUTHERFORD:** -- so...

16          **MR. GRIFFON:** I think you almost answered one  
17          of my questions, but just to step back one  
18          second, the -- in this table 31 you have 21  
19          cases. They were in this first line that says  
20          generic, and you have 21 cases and you have  
21          your median and your GSD.

22          **MS. WESTBROOK:** Uh-huh.

23          **MR. GRIFFON:** Am I understanding that you had  
24          21 people --

25          **MS. WESTBROOK:** Yes.

1           **MR. GRIFFON:** -- that you had urine data for  
2 each one of them?

3           **MS. WESTBROOK:** Yes.

4           **MR. GRIFFON:** Did you back-calculate intakes  
5 for each person and then average -- do a  
6 distribution with those numbers, or how did you  
7 manip--

8           **MS. WESTBROOK:** I used IMBA.

9           **MR. RUTHERFORD:** Yes.

10          **MR. GRIFFON:** Right.

11          **MS. WESTBROOK:** Your -- or person by person --

12          **MR. GRIFFON:** Right, okay. That's what I --

13          **MS. WESTBROOK:** -- and -- yeah. And then I  
14 averaged the intakes.

15          **MR. GRIFFON:** So then you averaged all the 21  
16 intakes that you got?

17          **MS. WESTBROOK:** Yes.

18          **MR. GRIFFON:** Okay. And got a GS-- I just  
19 wanted to understand that.

20 All right, the -- the second question I think -  
21 - I think you answered for me, and the last  
22 question, or maybe just the last point, is for  
23 this second line I see this -- these raffinate  
24 workers, as you referenced them. Is there  
25 anywhere in this guidance that -- that you

1           would say -- in the site profile that you would  
2           say if you have someone that worked mainly in  
3           the raffinate area, I -- you may apply these  
4           different isotopic distributions for. You  
5           know, that goes back to our last point, so I'm  
6           not going to belabor it, but is the intake not  
7           only uranium. It could be --

8           **MS. WESTBROOK:** In the instructions I address  
9           the -- what dose -- what radioisotopic set to  
10          use --

11          **MR. GRIFFON:** Okay.

12          **MS. WESTBROOK:** -- and so that...

13          **MR. GRIFFON:** That would be covered there.  
14          Right?

15          **MS. WESTBROOK:** I think so.

16          **MR. GRIFFON:** All right.

17          **MS. WESTBROOK:** I'm just drawing a blank about  
18          what I said in the instructions about raffinate  
19          workers, but I believe I did address that.

20          **MR. GRIFFON:** Okay. And the -- and the other  
21          point that I think you answered was -- but --  
22          but I'm not -- for me, it might have been  
23          helpful in this -- in this profile to see was --  
24          -- 'cause I sat here at the end of these tables  
25          wondering how did these picocuries per year

1           calculated from the urinalysis compare to the -  
2           - the -- I guess comparing apples and apples,  
3           to some extent -- to the air sampling. And I'm  
4           not -- it's going to be a little bit of a  
5           stretch to compare those things 'cause workers  
6           go in different areas so you wouldn't have one  
7           worker in one location. But did you try to do  
8           that? You know what I'm saying? Cross-  
9           validate where they were sampling and --

10       **MS. WESTBROOK:** Didn't have time.

11       **MR. GRIFFON:** Right, right. So you've got the  
12       data there and you can make those comparisons.

13       **MR. RUTHERFORD:** And I think it's -- this is  
14       LaVon speaking again. I think that's something  
15       that -- you know, and I think Jim probably  
16       mentioned it, too. We all know that these are  
17       -- are living TBDs, there's -- you know, as  
18       more data, as more time and as more everything  
19       permits, we -- you know, we would all like to  
20       get down to the point where we've got these --  
21       we feel like we've really got these ironed out  
22       perfectly. I mean that's one of the first  
23       things I thought when I -- when I -- 'cause I  
24       mean I originally wasn't involved in the  
25       writing of the TBD and -- and -- but I wor-- do

1           -- have worked on the SEC evaluation and so,  
2           you know, the first thing in my mind was okay,  
3           well, let's -- let's start looking urinalysis  
4           data, let's look at air sample data, let's see  
5           if we can establish some type of intake ratios  
6           based on this that -- if we can see if it's --  
7           if it's consistent across the board, and then  
8           we --

9           **MR. GRIFFON:** Or if they're in the ball park.  
10          Right?

11          **MR. RUTHERFORD:** Right, if we're in the ball --

12          **MR. GRIFFON:** Is where you try to look --

13          **MR. BELL:** To be reassuring.

14          **MR. RUTHERFORD:** Exactly, exactly. And I think  
15          that's something that may happen at some point,  
16          you know, but we also have to look at the other  
17          -- of trying to get as many done as we can and  
18          ensure we're falling on the right side, of  
19          course, but...

20          **MS. ROBERTSON-DEMERS:** This is Kathy, I've got  
21          a question.

22          With respect to mobile workers, like  
23          electricians that may have gone from plant to  
24          plant, how do you apply the coworker data?

25          **MS. WESTBROOK:** This is Janet. In the

1           urinalysis records they would say  
2           "maintenance". That is all they would say, so  
3           -- so they were grouped. But again, you use  
4           the guy's own data, and I think that that would  
5           be still reasonable because the maintenance  
6           people, as I recall, didn't vary that much.  
7           You would think they would, depending on  
8           whether they were in plant six or plant four.  
9           But as it happened, I think because they were  
10          roving around, maybe they were more homogenous  
11          than you would think. But anyway, it didn't  
12          look like that big a spread for them.  
13          However, that said -- I have to qualify that  
14          because I think there were some people who were  
15          working in the shop and some people who  
16          actually went out roving around -- you know,  
17          they were the mobile fixers -- and I think they  
18          were the ones who were more exposed than the  
19          people at the shop, in terms of breathing fresh  
20          stuff in the air. However, the people in the  
21          shop were working on contaminated equipment. I  
22          mean this has been mentioned in some documents  
23          that the AEC apparently, you know, had a  
24          concern or whatever, wanted to get that checked  
25          out. So again, I don't know why, but I tend to

1 think that it may not be that big a spread;  
2 therefore it may not be that much of an issue.  
3 But again, it's always better for the guy to  
4 have his own data, and they were -- the  
5 maintenance people were apparently included in  
6 the urinalysis program 'cause certainly there's  
7 a lot of data for them.

8 **MR. BELL:** For them?

9 **MS. WESTBROOK:** Uh-huh.

10 **MR. GIBSON:** This is Mike Gibson. I'd just  
11 like to add -- and it may not be specific to  
12 Mallinckrodt, but you know, as a former  
13 maintenance worker I can tell you that some of  
14 the coworker data that was gathered on -- on me  
15 as an electrician and on some other trades that  
16 I worked with, was taken from the rad. tech  
17 who'd wear the air monitor. We were the ones  
18 with our face in the work and he was across the  
19 room. So it's not always -- in my opinion, I  
20 don't think it's always going to be a fair  
21 comparison to look at just the electricians' or  
22 the mechanics' data and take that as something  
23 that's a valid dose.

24 **MS. WESTBROOK:** Well -- this is Janet --  
25 though, if you were -- if that happened in an

1 era where there was an HP frequently right  
2 there taking your dose, that's one thing. But  
3 I think these dust studies that we're referring  
4 to in the '40's and '50's at Mallinckrodt, I  
5 think that the AEC guy was there. He was  
6 handling the stuff and he was getting -- he was  
7 putting it in the workers' area, not in his own  
8 because his own wasn't of interest. And so I  
9 understand what you mean. That would  
10 definitely perturb the results. But I don't  
11 think that happened at Mallinckrodt, especially  
12 not in the early years.

13 **MR. GIBSON:** Well, yeah, I'm just saying in  
14 general for some of these other site profiles,  
15 you know. I don't think it's fair just to look  
16 at a class of workers. You may have to delve  
17 in deeper and look at what crew made up that  
18 team that did that work. 'Cause typically we  
19 would have tools, so we wouldn't want to be --

20 **MS. WESTBROOK:** Uh-huh.

21 **MR. GIBSON:** -- the monitor and everything  
22 else.

23 **MR. RUTHERFORD:** And that's a perfect example  
24 where -- where -- comparing your air sample  
25 data to your urine data because, you know,

1           indications where -- to see if there are  
2           representative -- if they -- if they do  
3           correlate. That's a -- that's a good example,  
4           when -- because if -- if they're taking the  
5           breathing zone sample and it's not really a  
6           breathing zone sample but back away, it's --  
7           it's obviously going to read lower than what  
8           you're -- in that worker area compared to --  
9           and so you can take the urine data and do some  
10          comparisons there. I think that's a good  
11          point.

12         **MR. GIBSON:** This is Mike again. In the latter  
13         years, though, they replaced the bioassay data  
14         with air sampling data.

15         **MR. RUTHERFORD:** That's true.

16         **MR. GIBSON:** And so then therefore you're not  
17         going to have an -- that's a missed dose,  
18         technically -- or realistically.

19         **MR. BELL:** Tom here. Janet, I just wanted to  
20         point out that you mentioned they had AEC  
21         people watching and trying to make sure it was  
22         in the right zone, but they really didn't come  
23         into existence till about '48. So you really  
24         still have that problem in the early period  
25         when they didn't really have health physics

1 people monitoring what was happening or what  
2 kind of doses they were getting, so I don't  
3 think you can state that they really had that  
4 kind of supervision or that kind of placement  
5 of things because it -- from what we learned,  
6 at least from the experts we've talked to, they  
7 didn't have those kind of people standing  
8 around watching the process until AEC got  
9 involved later, in '47, '48.

10 **MS. WESTBROOK:** I would like to make a point  
11 about that. In this review a lot is made of  
12 like the Mont Mason paper and this other thing  
13 that compared '48 and '50 data. And in here  
14 the criticism was made of that -- of using '48  
15 data, that oh, oh, upgrades were put in and,  
16 you know, this was after the time, and da, da,  
17 da, da, da. But in the Mont Mason paper he  
18 specifically says that the health program was  
19 set up in '47. The first thing they did in '48  
20 was they started to take the dust studies, and  
21 then they started upgrading in late '48 and  
22 into '49.

23 **MR. BELL:** Right, uh-huh.

24 **MS. WESTBROOK:** So the -- most of the '48 data  
25 will be representative of those early '46, '47,

1 '48 years because they were basically doing  
2 things the same in those three years. It was a  
3 brand new plant in '46, so maybe conditions  
4 would have actually been better in '46 than  
5 they were in '48. But certainly they were  
6 ramping up production through '46 and '48 and I  
7 think -- and in '48 one of the reasons for  
8 their wanting to do things was they realized  
9 there were problems from their dust studies.  
10 So to me, that '48 data probably represents the  
11 -- for a lot of people, a lot of process  
12 workers, the peak of dust exposures because --  
13 based on the production and on the sort of  
14 working conditions -- and the pitchblende.

15 **MR. GRIFFON:** They only qualify -- when I --  
16 when I hear this I reflect back on the same  
17 comment I made from Bethlehem Steel, which is  
18 that with all this household stuff my -- my gut  
19 reaction is any time an inspection occurs I  
20 wonder how representative those samples are of  
21 the reality. And that first set was probably  
22 the most representative, and then they said --  
23 they got slapped and said they've got to do all  
24 these fixes and they said well, the next time  
25 these guys come in here we're going to get some

1 low samples. I can guarantee that, you know.

2 **MR. RUTHERFORD:** But that wouldn't exactly be  
3 true.

4 **MR. GRIFFON:** Paint those floors and, you know  
5 -- I mean we know how this worked, you know, so  
6 --

7 **MS. WESTBROOK:** Well, this is Janet, but I --

8 **MR. GRIFFON:** Yeah.

9 **MS. WESTBROOK:** I have to say that Mallinckrodt  
10 itself was the impetus behind putting in the  
11 shielding.

12 **MR. GRIFFON:** Right.

13 **MS. WESTBROOK:** You can see it in the memos  
14 where they're --

15 **MR. GRIFFON:** Right.

16 **MS. WESTBROOK:** -- remonstrating the AEC and  
17 they say we built this plant six and, you know,  
18 you said that if there were problems you'd give  
19 us money to put in the fixes and we see there  
20 are problems and you acknowledge it and so you  
21 -- so they're leaning on AEC to do the right  
22 thing. And usually it was AEC leaning on the  
23 contractors. Like Harshaw had to be leaned on  
24 very firmly. But Mallinckrodt, oftentimes it  
25 came from them, so --

1           **MR. GRIFFON:** Yeah, yeah, yeah, no, I --

2           **MS. WESTBROOK:** Yeah, oh, I know. I just  
3 wanted to have it on the record --

4           **MR. GRIFFON:** It's just a reality check, yeah.

5           **MS. WESTBROOK:** -- you know, poor Mallinckrodt.  
6 They were --

7           **MR. BELL:** Janet, this is Tom.

8           **MS. WESTBROOK:** -- one of the best sites.

9           **MR. BELL:** I wanted to ask a question. You  
10 said you thought that -- in '48 that that was  
11 kind of the peak of what it would have been  
12 from '46 to '48. I've often thought --

13           **MS. WESTBROOK:** Somewhat.

14           **MR. BELL:** -- a little the other way around. I  
15 was kind of curious --

16           **MS. WESTBROOK:** Okay.

17           **MR. BELL:** -- what your sources were, because  
18 it would seem to me before they had the AEC  
19 folks and the New York Operations Office folks  
20 come in their procedures were still a little  
21 more sloppy in those days and they didn't have  
22 the supervision. So to me, I'm a little  
23 concerned that it's a little worse before they  
24 got there and started to do all these dust  
25 studies. But -- but I don't have good data to

1 support one way or the other, but I think it's  
2 a little difficult to say one way or the other  
3 how that data was. I mean I'd -- I'd just be  
4 cautious on that.

5 **MR. RUTHERFORD:** Well, we -- this is LaVon  
6 again. We do have '46 -- some '46 data, you  
7 know, that was taken by Mallinckrodt. We have  
8 some -- actually after plant six started  
9 operations, we have a little bit of data from  
10 that. Again, it's not the detail -- the '48  
11 data that we had, but I tend -- I agree with  
12 Janet a lot. If you were -- read most of these  
13 reports, the initial identification of issues  
14 and problems was done by Mallinckrodt. They  
15 were -- when AEC came in in '48 on the initial  
16 dust study, it did -- based on the reports from  
17 Mallinckrodt, it did them no good to try to  
18 downplay the -- the issues and problems with  
19 that facility. They had already sent memos to  
20 AEC and -- and other, you know, government  
21 groups identifying problems with the facility.  
22 So the -- you know -- you know, for them to  
23 downplay or try to, you know, cut exposure  
24 potentials at that point, it would have done  
25 them no good. It would have just shown, you

1 know -- I mean it wouldn't have helped them in  
2 their -- in -- from their earlier reports.  
3 And clearly -- you can look at the '48 data at  
4 the beginning of '48 and then look at the later  
5 in '48 after administrative controls that they  
6 implemented, there's a huge change. And then  
7 two-fold change after that, you know, once the  
8 engineering controls were implemented, so -- I  
9 don't know. You know, I think the argument is  
10 still there that you -- you can use that early  
11 '48 data, and I think -- with the '46 data and  
12 the rest of the stuff that we have, urinalysis  
13 data from '48 and from workers that worked in  
14 those earlier years, that -- that we -- we can  
15 build a good exposure model for that '46 to '48  
16 period.

17 Okay. So I guess we agreed on -- on the  
18 coworker data we're just going to reword that a  
19 little bit on the -- and -- on the -- and then  
20 we -- we are going to -- we've committed to  
21 updating the TBD to address this in better  
22 detail, as well as also hopefully get in the 95  
23 percent confidence level and other issues that  
24 are more of a global -- okay.

25 All right. I want to take a short break and --

1 to use the rest room and facilities and kind of  
2 collect our thoughts.

3 (Whereupon, a recess was taken from 2:50 p.m.  
4 to 3:05 p.m.)

5 **DISCUSSION TOPIC 8**

6 **MR. RUTHERFORD:** Okay, let's move on to number  
7 eight. And really we've kind of discussed this  
8 already a little bit. This is a discussion of  
9 the use of the time-weighted averages, and I  
10 guess Jim had discussed this earlier, kind of  
11 the discussion on the chronic exposures over a  
12 period of time and how we felt like the  
13 episodic exposures were -- short episodic  
14 exposures were kind of considered in that data  
15 and how -- and I guess the time-weighted data  
16 we feel is a pretty good fit, so... response.

17 **MS. ROBERTSON-DEMERS:** Okay, I -- can I give  
18 you a question first?

19 **MR. RUTHERFORD:** Oh, darn it, I thought I was  
20 asking -- go ahead.

21 **MS. ROBERTSON-DEMERS:** Time-weighted averages  
22 are figured on eight-hour days?

23 **MR. BELL:** According to your TBD, that's  
24 correct.

25 **MS. WESTBROOK:** They were, because the -- when

1 I first started doing that -- this is Janet --  
2 a couple of the dust studies actually used the  
3 eight-hour-and-15-minute day oftentimes, but it  
4 was clear that 15 minutes was just like wasted  
5 time or extra time or whatever, and when they  
6 tabulated it, it was eight hours. However,  
7 because you guys asked, I looked again, and now  
8 we have more dust studies and more -- more data  
9 from Mallinckrodt itself, and I actually have --  
10 -- some Post-its here -- it's a plant four dust  
11 study of 1949 showed 495 minutes, so that's the  
12 eight hours and 15 minutes.

13 Later ones, however, especially the  
14 Mallinckrodt ones from '50 to '51, show 525  
15 minutes for some workers, so that's an eight-  
16 hour-and-45-minute day, which lunch was an hour  
17 and a half and the locker room was 35 minutes.  
18 Okay, those -- there are some dust levels in  
19 those areas, but of course they're not process  
20 levels.

21 Some other workers, quite a few other workers,  
22 had 510 minutes and you can do the math there.  
23 So as you can see, it ranged from -- the night  
24 guys all seemed to have 495-minute shifts and  
25 the day guys most often would probably be 510

1           and the lesser chunk was 525.

2           So I think it's probably easier, instead of

3           trying to figure out person and year and day

4           and everything, to pick one time -- the eight

5           hours -- express everything in like

6           commensurate units, the eight-hour shift, and

7           then make the adjustment for whichever guy. So

8           what I was thinking about doing -- so thanks

9           for bringing this to my attention -- was making

10          a chart of what job titles had what times in

11          what years, because it did change from year to

12          year. And that way the dose reconstructor can

13          make -- make the adjustment.

14          Now our policy normally is that if one person,

15          the TBD author, can spend a day or two doing

16          math that would save ten or 12 dose

17          reconstructors several hours each, it's well

18          worth it for me to do it at the front end.

19          However, here we don't -- it's very variable

20          according to the person. So I think it would

21          be best probably that -- I do not speak for my

22          group -- I haven't talked to my supervisor --

23          or for NIOSH or for the team, but I think it

24          would be best to leave it at the nominal eight

25          hours and then scale it up as -- according to

1 the person's job and his actual time.

2 **MR. BELL:** That's what Kathy wants to discuss.

3 **MS. ROBERTSON-DEMERS:** Well, this is Kathy. I  
4 wanted to read to you something that I found --  
5 and this is actually on the internet, so I'll  
6 give you the address.

7 **MS. WESTBROOK:** Sure.

8 **MS. ROBERTSON-DEMERS:** It's a report from the  
9 uranium division of Mallinckrodt, and it says  
10 the work days were long, sometimes 14 hours and  
11 more, and for many it was a seven-day week  
12 grind. Holidays and vacations didn't exist as  
13 days off. They were just more days to be  
14 worked.

15 **MR. RUTHERFORD:** This is LaVon. What time  
16 period does that address?

17 **MS. ROBERTSON-DEMERS:** This document was  
18 written in the mid-fifties.

19 **MR. RUTHERFORD:** It was written, but does it  
20 address a certain time period?

21 **MS. ROBERTSON-DEMERS:** No.

22 **MR. RUTHERFORD:** Okay.

23 **MR. BELL:** We heard -- we heard in our site  
24 discussions with the experts that this was  
25 particularly a big problem in the '40's, I

1 think. I don't know what all -- I mean they  
2 all talked about this problem, but --

3 **MR. FITZGERALD:** Which makes sense, given the  
4 fact that the other materials production plants  
5 did not --

6 **MR. BELL:** Well, they were the first ones --

7 **MR. FITZGERALD:** They were the first ones --

8 **MR. BELL:** -- tremendous pressure --

9 **MR. FITZGERALD:** -- they had -- they had --

10 **MR. BELL:** -- produce as much as they --

11 **MR. RUTHERFORD:** Sure, and you've seen a lot of  
12 that, especially in the '42 group that -- mid--  
13 mid and later '40's, I agree with that.

14 **MR. GRIFFON:** Can I ask a silly question?

15 **MR. RUTHERFORD:** Go ahead.

16 **MR. GRIFFON:** How would this impact the dose  
17 reconstructor?

18 **MR. RUTHERFORD:** Well, I think he's -- what  
19 Kathy's inferring --

20 **MR. GRIFFON:** 'Cause you're using urinalysis  
21 data to get your intake.

22 **MR. RUTHERFORD:** Yeah, I'm -- I was going to  
23 get to that.

24 **MR. GRIFFON:** Okay. I'm sorry.

25 **MR. RUTHERFORD:** I think what Kathy's referring

1 to is the fact that a time-weighted average is  
2 based on an eight-hour day. The corrections  
3 would have to be made to support an individual  
4 working 12, 14 hours per day and --

5 **MR. GRIFFON:** No, I understand, but they're not  
6 even --

7 **MR. RUTHERFORD:** Yeah.

8 **MR. GRIFFON:** It seems to me you're not even  
9 using that for your internal doses, are you?  
10 Or maybe as your tertiary source. Right.

11 **MR. RUTHERFORD:** I think the years that --

12 **MS. WESTBROOK:** That's correct.

13 **MR. RUTHERFORD:** Yeah, I think --

14 **MR. GRIFFON:** Yeah, okay. So --

15 **MR. RUTHERFORD:** -- the '46 to '48 period is  
16 what we really -- and again, I think the method  
17 we have to handle '46 to '48 will -- would take  
18 that into consideration, so I agree that yeah,  
19 longer hours, we'd have to address that because  
20 the time-weighted average is on an eight-hours  
21 -- but I don't think that makes the time-  
22 weighted average a bad analysis.

23 **MS. ROBERTSON-DEMERS:** No, I just bring this up  
24 as --

25 **MR. RUTHERFORD:** Yeah.

1           **MS. ROBERTSON-DEMERS:** -- another element to  
2 consider.

3           **MR. RUTHERFORD:** Yes.

4           **MS. WESTBROOK:** This is Janet. Harshaw started  
5 in 1942 and so did Vitro, so three out of three  
6 of my sites all started up in 1942. I just  
7 offer that for what it's worth.

8           **MR. GRIFFON:** The other thing that strikes me  
9 when you say the dust studies and the  
10 differences in times in minutes, 525 to 4-  
11 whatever, it strikes me -- is that the -- the  
12 inspector's shift or the worker's shift? You  
13 know, that's a question I would have, the  
14 people making the measurements' shift or the --  
15 you know, the guy doing the survey might have  
16 just decided well, this is for the period I'm  
17 measuring over and I'm -- I'm leaving when I'm  
18 done or -- I mean I don't know if you've  
19 checked into that or asked about that or --

20           **MR. FLEMING:** This is Kenny. We looked at some  
21 of that data last week, Mark, and actually went  
22 up to 540 minutes. There was a consistent set  
23 of like nine hours 'cause I remember kind of  
24 looking at that and it -- it broke it down by,  
25 you know, the -- the dress-out --

1           **MR. GRIFFON:** Right, to the locker room.

2           Right? Or whatever --

3           **MR. FLEMING:** Yeah, all that sort of time and  
4           operational period and then it went through the  
5           afternoon that they did it, so they broke it  
6           down in each segment of time that they used  
7           and, you know, they went from anywhere from 480  
8           minutes to -- to 540 minutes as --

9           **MR. GRIFFON:** And the last task had -- had them  
10          going to the locker room and basically leaving.  
11          Right? So it's pretty clear it was the end of  
12          the shift.

13          **MR. FLEMING:** But there -- but there was  
14          typically concentration measurements that were  
15          assigned for -- for each one of those, because  
16          just because they, you know, took a break and -  
17          - and went someplace to take a smoke, in some  
18          cases they -- you know, the airborne  
19          concentration in those areas was as high, if  
20          not higher, than some of the production areas  
21          they found in some of the areas, so -- when was  
22          interesting when you looked at that.

23          **MR. GRIFFON:** Oh, no, I'm -- maybe I wasn't cl-  
24          - I'm just getting back to my previous issue,  
25          which was that maybe during the inspections

1           they weren't working these 14-hour days, but  
2           maybe other periods they were, you know. So I  
3           don't know how you can really resolve that. I  
4           don't know that you have records either way  
5           to...

6           **MR. FLEMING:** I'm just trying to be practical.  
7           I mean I -- you know, even though you've got a  
8           period -- I've thought through the process of  
9           14 hours a day at seven days a week. I'm just  
10          wondering how long a person can physically,  
11          mentally do a job. And I don't -- I'm not  
12          disputing that because there was one claimant  
13          in OCAS that made that same statement. There's  
14          multiple claimants in NOCTS that make the  
15          statement of 12-hour days seven days a week. I  
16          just -- I question, you know, physically,  
17          mentally how you could do that sort of -- sort  
18          of work for -- for a consistent period of time  
19          and not break down.

20          **MS. MUNN:** No, you don't. You do it for a few  
21          months.

22          **MR. GRIFFON:** And I think you might have -- you  
23          might have just answered the question on why it  
24          needs to be addressed, though. Because they're  
25          going to read this report and say eight-hour

1 days, we worked 14-hour days.

2 **UNIDENTIFIED:** They are --

3 **MR. GRIFFON:** And may-- and if you follow up,  
4 maybe it turns out it was only for these three  
5 months or for this one short period where they  
6 were getting up to production or whatever. You  
7 know, maybe you can narrow it down by going  
8 back to some of the interviewees.

9 **MR. FITZGERALD:** It almost would seem like it  
10 was campaigns that might have involved the --

11 **MR. GRIFFON:** Yeah.

12 **MS. MUNN:** Uh-huh.

13 **MR. BELL:** Just a suggestion -- this is Tom  
14 again. An awful lot of these people we talked  
15 to really did talk about 12-hour days at least  
16 five days a week. I mean there you're at a --  
17 at least a 60-hour week, and it seems to me  
18 that -- especially in the early period when we  
19 know they were under intense pressure to  
20 produce a lot of this stuff, that there ought  
21 to be some special consideration given to that  
22 early time period in terms of hours worked  
23 because I think it's realistic that they were  
24 being worked as much as they could push them to  
25 work, you know. And they were getting paid for

1           it, but you know, not too bad a pay, I guess,  
2           compared to other professions at the time, but  
3           still, they were getting pushed pretty hard to  
4           produce as much as they could.

5           **MS. WESTBROOK:** Well, I'd also like to add --  
6           this is Janet -- that they had shifts. And if  
7           the shifts were fully manned -- I mean if the  
8           equipment was fully manned on the shift, it  
9           wouldn't really make that much sense to have  
10          that many people carry over that many hours  
11          because they'd just get in each other's way  
12          when the -- you know, if two guys fit in front  
13          of a piece of equipment, what is the third one  
14          going to do? So in a certain sense I can  
15          understand. If they had fewer people, then  
16          they might need to fully get the -- to keep the  
17          equipment going at 100 percent production, then  
18          it would be credible that they would work those  
19          extra-long hours day after day, week after  
20          week, month after month, and not just  
21          periodically as somebody else was off on  
22          vacation or out sick. But -- but if it's a  
23          case, as I suspect might have been the case in  
24          the full -- especially the heavy production  
25          years, that they -- each shift had as many

1 people as it needed, then it wouldn't make that  
2 much sense to have all those people.

3 **MR. BELL:** This is Tom. You're talking about  
4 shifts of eight hours each, 24 hours a day?

5 **MS. WESTBROOK:** Uh-huh.

6 **MR. BELL:** Is that what you're assuming?

7 **MS. WESTBROOK:** Uh-huh.

8 **MR. GRIFFON:** Well, I guess this -- I mean it's  
9 -- I have other DOE analogies, but it strikes  
10 me that it might be a situation like an outage  
11 at a power plant. Everybody's working 12, 14,  
12 16-hour days for a short period of time. And  
13 when you interview them 30 years later, they  
14 might sa-- you know --

15 **MR. BELL:** Yeah, think it --

16 **MR. GRIFFON:** -- they might say oh, we worked  
17 ten, 12 hours every day, you know. That's what  
18 they remember. They don't remember, you know,  
19 the -- so -- so probing it more, you might find  
20 that it was for the more limited periods of  
21 time or something.

22 **MR. RUTHERFORD:** This is LaVon. I'd like to  
23 add -- I think it was brought up -- I think '42  
24 to '45 when they were doing a lot of the manual  
25 processes had that high pressure to produce for

1           the war effort and -- and clearly the manual  
2           processes and the changes in processes and the  
3           changes -- you know, the work force there -- I  
4           mean I could clearly see them working large  
5           period -- large number of hours. I think Janet  
6           makes a good point, and once the production  
7           became a -- you know, a -- a more of a  
8           continuous flow process, you know, your --  
9           because as long as your work force is  
10          established, that -- that your -- your number  
11          of individuals that are working over -- I mean  
12          you see maintenance personnel pulling -- you  
13          know, especially as new equipment's breaking  
14          down and things like that, you can see that.  
15          But I think that -- I guess, you know, the '46  
16          on, I think the data that we have -- especially  
17          -- once urinalyses were started, you know,  
18          whether they worked, you know, eight hours or  
19          12 hours, once -- and once film badges were  
20          started, it didn't -- you know, it doesn't  
21          matter. We have data. We can support it. So  
22          I -- I agree, you know, that we -- we need to  
23          probably address that, but -- in the TBD, the  
24          statement for individuals that worked a -- you  
25          know, or just -- you know, come up with

1 something to say about the number of hours.  
2 And clearly each dose reconstruction, every  
3 time we read -- read an -- a claimant  
4 interview, we have to evaluate that, so...

5 **MR. BELL:** I would think -- this is Tom again.  
6 I would think if you mention that -- that  
7 you're sensitive to that in looking at their  
8 CATI interviews and when they tell you that,  
9 then try to adjust that in somehow would be --  
10 would go a long way. The only other problem  
11 you have is there are a lot of survivors,  
12 people who don't understand those hours very  
13 well, and so they might not realize -- unless  
14 their husband was never home and -- or their  
15 wife's never home and, you know, they say he  
16 always worked and never came home sort of  
17 thing, but -- but anyway, it's an issue you  
18 should have some sensitivity to in discussion.

19 **MS. ROBERTSON-DEMERS:** That's just another  
20 factor that you need to fit into that  
21 uncertainty.

22 **MS. WESTBROOK:** Well, and that -- it seems to  
23 me to be a factor that would benefit by talking  
24 to a lot of former workers. I mean 'cause the  
25 more you interview, then maybe the more

1 balanced view or the more -- better  
2 recollection that would be --

3 **MR. RUTHERFORD:** We also have --

4 **MR. FITZGERALD:** Would there be any way to look  
5 into the payroll records as --

6 **MR. RUTHERFORD:** I was just getting ready to  
7 say that. We also have payroll records and  
8 things that we could review and look on --

9 **MR. FITZGERALD:** That would really nail this --

10 **MR. RUTHERFORD:** -- on hours that could --

11 **MR. FITZGERALD:** -- one way or the other.

12 **MR. RUTHERFORD:** -- could find some of those  
13 years.

14 **MR. FITZGERALD:** These are records that would  
15 go back to say the '40's?

16 **MR. RUTHERFORD:** Yes, and I've only looked at a  
17 few of those, so I can't say exactly how far  
18 they go back and -- but I do know that -- that  
19 some of that data is definitely available.

20 **MR. FITZGERALD:** Yeah, 'cause that would  
21 certainly be worth getting a perspective on.  
22 That would answer the question -- I mean would  
23 not be speculation then.

24 **MR. RUTHERFORD:** This is LaVon again. We may  
25 find it -- out it might be a certain group of

1 individuals, so...

2 **DISCUSSION TOPIC 9**

3 Okay. Okay, number nine, that was more of --  
4 was trying to figure out -- I mean there --  
5 there's a discussion on respirator use in  
6 5.2.2.3, and it's under the Findings section,  
7 and the TBD clearly doesn't use that, so...

8 **MS. ROBERTSON-DEMERS:** Yeah, we -- we're going  
9 to take it out.

10 **MR. BELL:** We understand that. We intended to  
11 move that somewhere else, and I forgot to do  
12 that before you got the draft.

13 **MR. RUTHERFORD:** That's fine.

14 **MR. BELL:** I mean I -- we're -- I'm thinking of  
15 putting it in the next section where we're  
16 dealing with blowouts and other things just to  
17 mention this problem, but --

18

19 **DISCUSSION TOPIC 10**

20 **MR. RUTHERFORD:** Okay. Number ten. This was  
21 the one -- we actually discussed this a little  
22 bit earlier. On page 37, the discussion on  
23 thorium -- thorium activities in 7E, and really  
24 this is -- you know, this is what we discussed  
25 earlier, that we feel like it's a comparison of

1 apples to oranges in that -- that the work that  
2 was done in 7E, comparing that to the Weldon  
3 Springs data wasn't really applicable.

4 **MR. FITZGERALD:** I think what we agreed on  
5 solving that issue was to add a little bit  
6 additional perspective so it's clear to anyone  
7 who reads that why there's -- mentioning both -  
8 - provide the context of why Weldon's  
9 mentioned.

10 **MR. RUTHERFORD:** That's fine.

11 **MR. BELL:** Merely that it should be considered  
12 in the total dose perspective?

13 **MR. RUTHERFORD:** Right.

14 **MR. FITZGERALD:** Yeah. So I think that'll take  
15 care of both.

16 **DISCUSSION TOPIC 11**

17 **MS. ROBERTSON-DEMERS:** Number 11, we believe we  
18 have the wrong building number.

19 **MR. RUTHERFORD:** Oh.

20 **MS. ROBERTSON-DEMERS:** And we'll clarify that  
21 for you at a later time.

22 **MR. RUTHERFORD:** Okay.

23 **MR. FITZGERALD:** Is that the issue of 201?

24 **MR. RUTHERFORD:** Yeah, yeah, we --

25 **MR. BELL:** That was all --

1           **MR. RUTHERFORD:** -- I believe 201 was -- Janet,  
2           correct me if I'm wrong, wasn't it 201?

3           **MS. WESTBROOK:** Plant five.

4           **MR. RUTHERFORD:** Yeah, that was work done --

5           **MR. BELL:** Well, the more I looked for 201 -- I  
6           couldn't find a building 201, either, and it  
7           wasn't (unintelligible) stuff so maybe it was  
8           an error or something, or it could have maybe  
9           been applied to Weldon Springs and the guy was  
10          talking backwards. I don't know.

11          **MS. WESTBROOK:** I think it -- this is Janet. I  
12          think it's plant five.

13          **MR. BELL:** It should be plant five, yeah. Or  
14          plant -- plant five or plant six?

15          **MS. WESTBROOK:** Plant five, therefore it's out  
16          of scope for the TBD.

17          **MR. BELL:** Well, I thought it might be plant  
18          six, building 105 where they had the ether  
19          house stuff. Isn't that...

20          **MS. ROBERTSON-DEMERS:** We're trying to clarify  
21          that.

22          **MR. BELL:** Well, it needs to be clarified.

23          **MS. WESTBROOK:** Okay.

24                                   **DISCUSSION TOPIC 12**

25          **MR. RUTHERFORD:** That's fine. Number 12, and I

1 wish Jim was here for this one. This was -- on  
2 page 48, this was kind of a discussion of --  
3 almost like a synergistic effect type --  
4 because they had -- had physical impairment  
5 from chemical exposures that, along with the  
6 radiological exposure, those needed to be  
7 evaluated, you know, together. And if you look  
8 on page 48 on the -- I think it was 48, let me  
9 look here. No, I'm missing this.

10 **MR. BELL:** I think it was somewhere else --  
11 yeah, it was later in the --

12 **MR. RUTHERFORD:** It was later -- later in the  
13 document.

14 **MR. BELL:** Yeah, I think it was, too.

15 **MR. RUTHERFORD:** Yeah, it was later. Hold on,  
16 I have to find it. I'm wrong.

17 (Pause)

18 **MR. BELL:** On 45 you talk about similarity in  
19 individuals with impaired renal --

20 **MR. RUTHERFORD:** Oh, that's it, that's it.  
21 Page 45.

22 **MR. BELL:** 45, I was going to say I think that  
23 sounds better.

24 **MR. RUTHERFORD:** And it goes into (reading)  
25 thus, for an example, a individual with

1           impaired respiratory function or epithelial  
2           integrity due to acid exposure could be subject  
3           to different biokinetic modeling than a normal  
4           individual. Similarly, an individual with  
5           impaired renal clearance would require a non-  
6           standard model for biokinetics.

7           And I guess what I took from that was that --  
8           that we were looking at individuals that had  
9           both a physical impairment from a chemical  
10          exposure and -- and -- and with a radiological  
11          exposure and looking at both of those, and  
12          which -- that's really outside the -- the rule.

13         **MR. BELL:** Well, we realized that when we said  
14          that, but I think we were -- were trying to  
15          point out that you've got -- you do have some  
16          synergism you're always picking up with your  
17          radiation dose, so -- where a person may have  
18          the damage. You can't assess it 'cause you  
19          don't -- you haven't done renal studies or --  
20          or other things.

21         **MR. GRIFFON:** Does that --

22         **MR. RUTHERFORD:** I'm going to let Jim -- when  
23          Jim gets back in here --

24         **MR. BELL:** All right. Yeah, he'll tear into  
25          that one, won't he?

1           **MR. RUTHERFORD:** -- we'll let him tackle this  
2           'cause this one is -- you know, this is more of  
3           a policy and rule issue that I think Jim would  
4           be better to address.

5           **MR. GRIFFON:** I'm curious, though. ICRP-66  
6           does have some correction factors that you can  
7           apply for calculating lung doses. I know  
8           there's at least some in there for smoking, and  
9           I think there might be some in there for  
10          certain exposures other than -- other than  
11          radiological. I'm not fam-- anybody know ICRP-  
12          66 better than I? I mean I -- just might point  
13          to that. That's the only thing I --

14          **MR. RUTHERFORD:** Well, I think taking into  
15          account smoking, IMBA already does that, you  
16          know. I mean -- not IMBA, I mean the --

17          **MR. GRIFFON:** IREP.

18          **MR. RUTHERFORD:** -- IREP already does that.

19          **MR. GRIFFON:** But that goes the other way.

20          **MR. RUTHERFORD:** But it -- it does, but you're  
21          -- you're -- you've also got to look at --  
22          you're -- you're identifying lung -- or  
23          reduction in lung performance from smoking, is  
24          that -- you know, and how -- increased  
25          breathing rates from a -- a smoker or --



1           **MR. FITZGERALD:** Minimum dose, that issue.

2           **MR. RUTHERFORD:** Okay, good. Good.

3           **MR. FITZGERALD:** Is this on page 48 or --

4           **MR. RUTHERFORD:** Yeah, 6.3, yeah.

5           **MR. FITZGERALD:** Okay. Okay, right. Right, we  
6 have agreed to amend the language to make that  
7 a little clearer.

8           **MR. RUTHERFORD:** All right, we'll --

9           **MR. GRIFFON:** Can I -- I'll wait, I was just  
10 going to -- are you -- are you through with  
11 these issues? 'Cause I was going to say on  
12 page 44, which I think falls under Finding 5,  
13 we went past it already, but SCA outlined a  
14 number of things I think where -- again, I read  
15 a lot of this this morning on the airplane on  
16 the way out here, but it seems that there's  
17 some question about whether the appropriate  
18 maximum values were used in -- in ORAU's  
19 establishment of their distributions for  
20 various jobs and things like that. And I just  
21 wondered if we hit on that fully or if SCA's  
22 satisfied with the --

23           **MR. BELL:** No, I'd like to get another look at  
24 that.

25           **MR. GRIFFON:** Okay, I...

1           **MR. RUTHERFORD:** Okay. All right.

2           **MR. BELL:** Janet, you can probably help me with  
3 this a lot more, but as I went through some of  
4 the dust studies, and I think the ones that I  
5 found most interesting were the '48, '48 ones,  
6 both April and January, that had summary--  
7 summarized tables in the front. And although  
8 they have the dust study data calibrated in the  
9 back, they provided some summaries of job  
10 categories and -- and I'm sure you're familiar  
11 with that kind of format -- with maximum,  
12 minimums and highs and lows. And the thing  
13 that bothered me and the reason I put the  
14 number of them in there -- and we did it during  
15 a teleconference call a little bit, too, some  
16 of the data -- is that there's a wide range of  
17 how high some of these values get for a job  
18 category. And they're certainly well, well  
19 above these average table values. And maybe  
20 the 95 percentile will solve it, but it just  
21 seems to me that we're kind of neglecting the  
22 fact that there's a -- there are some very high  
23 readings here for individuals or for groups of  
24 individuals that are not taken into account in  
25 the tables 21 through 24 summaries. And I

1 don't know how to deal with that. I mean I  
2 know that we've talked in the past about trying  
3 to -- the fact that it's all averaged, weight-  
4 averaged and, you know, the short time they  
5 breathed this and so forth, it's all going to  
6 come out in the wash and it's going to be much  
7 lower. And if you go back into the basic  
8 report and you look at some of the values for  
9 their average concentration, that's true. But  
10 I'm still not convinced that these higher  
11 readings don't have, for certain individuals, a  
12 meaning that's beyond just the average table  
13 that's being used, and I don't know how you're  
14 taking that into account.

15 **MS. WESTBROOK:** This is Janet. What do you  
16 mean by "a meaning"?

17 **MR. BELL:** Well, I mean how -- if -- if these  
18 kinds of high concentrations existed for a job  
19 category, a person working in a high-risk  
20 situation with higher dose samples, and yet  
21 that individual, as a general rule, is given an  
22 average dust -- weighted dust average based on  
23 not his dose but just general information, I  
24 think you're leaving out an element of  
25 potential dose that isn't captured,

1 particularly when you're talking about, you  
2 know, 100,000s or even millions of counts so  
3 dpm per cubic meter in some of these dust  
4 studies. It's just that the summary tables --  
5 and the others have seen these kinds of things  
6 indicates well, how can my dose be that low  
7 when -- when this thing says that it was that  
8 high. And I -- I don't know whether it has to  
9 be totally corrected or some new technique  
10 done, but I think it should be addressed in  
11 some way. Other words, how -- how does the  
12 process you have take into account that there  
13 are such high readings, and how does the  
14 averaging process bring those down to where  
15 they're not a problem? Maybe that's what needs  
16 to be done. Okay?

17 **MR. RUTHERFORD:** This is LaVon again. I -- you  
18 know, I think -- I think for the period where  
19 we have urinalysis data, it's kind of a moot  
20 point. And we have -- have external exposure  
21 monitoring data, we can look at those and we  
22 can make -- look at air dust data and -- and we  
23 can develop comparisons based on the urinalysis  
24 data and the workers, you know. But -- and I -  
25 - and I think what we're -- I'm pretty sure

1           what we're going to find is it's -- it's going  
2           to be comparable. But the '46 to '48 period is  
3           the only period where we don't have that early  
4           -- early data, that urinalysis data. And again  
5           -- and we've already identified how we can  
6           handle that. So you know, I agree that --  
7           that, you know, we need to look at these  
8           potential high exposures, but -- exposure  
9           areas, but if you've got other data, source  
10          data that you could compare it off of, I don't  
11          -- I'm -- I guess I'm not seeing the issue.  
12          **MR. BELL:** Well, these -- these were taken  
13          starting in September, October 1948, so  
14          obviously they're in the process during the  
15          1940 time frame when AEC and NYOO was beginning  
16          to make changes to the process.  
17          **MR. RUTHERFORD:** But we have data from January  
18          of '48 --  
19          **MR. BELL:** I haven't seen --  
20          **MR. RUTHERFORD:** -- prior to --  
21          **MR. BELL:** -- too much of that, but I don't  
22          know how it compares with this. But still, it  
23          seems to me that you're using primarily this  
24          time frame to do your table 21 where you say  
25          this applies to everybody back to the early

1 period. And I just am concerned when I see  
2 these kinds of higher levels, even when the  
3 averages are considerably higher, and they  
4 don't reflect anything in the tables 21 through  
5 24 that come anywhere near those averages, and  
6 yet you say those averages cover those kinds of  
7 ca-- job categories. And I think for people  
8 looking at these documents -- and they've got  
9 them -- they're having a hard time correlating  
10 that. And I -- unless we explain it better,  
11 unless you -- unless you present how -- how  
12 those things come out in the wash and that  
13 they're not a problem for the individual, they  
14 think they've been exposed to much higher  
15 levels than what you're telling them in table  
16 21 through 24.

17 **MR. RUTHERFORD:** Well, I -- Janet just handed  
18 me a very good table. I think the -- what may  
19 be -- it is just more of an explanation issue,  
20 because you could look at the early '48 data  
21 and you can look at the later '48 data and  
22 there are a considerable difference, and I  
23 think Janet's laid it out here on a number of  
24 them just that, you know -- you know, three --  
25 a factor of three or four, and that was just in

1           the implementation of administrative controls,  
2           you know, to -- to workers, dropping dust  
3           exposure levels there. And then after the  
4           engineering controls, you drop by a factor of  
5           30 or 40, you know, and some -- even higher in  
6           some cases, you know. And -- and I think our -  
7           - our point is is that early '48 data is  
8           indicative to what workers were seeing. I  
9           think we've also identified that -- that it  
10          made no sense for Mallinckrodt to try to reduce  
11          exposures in that early '48 period because  
12          they'd already identified problems to AEC and  
13          to -- to individuals that they needed to make  
14          changes to the facility, and so they needed  
15          their support in early '48. And we had data in  
16          '46 -- a small amount of data from '46, as  
17          well, you know. So I agree that there may be  
18          the -- a confidence level that we need to  
19          address on that -- on that data, to address  
20          those early '46 through '48 period of unknown  
21          from a coworker standpoint.

22          But beyond that, I think we're -- I think we --  
23          we're fine. We've got urinalysis data. We've  
24          got, you know, the air dust data.

25          **MR. BELL:** Well, let me see if I can clarify --

1           this is Tom again. You're saying that you have  
2           early '48 data. Is that -- is that on the site  
3           research --

4           **MR. RUTHERFORD:** Yes, it is.

5           **MR. BELL:** -- database, 'cause I haven't found  
6           that.

7           **MR. RUTHERFORD:** It's there.

8           **MR. BELL:** 'Cause I found an awful lot of dust  
9           studies but I didn't spot that one. Are you  
10          saying that your little chart there shows that  
11          -- that it's higher in the early '48 than it is  
12          later?

13          **MR. RUTHERFORD:** Uh-huh.

14          **MR. BELL:** High exposures.

15          **MR. RUTHERFORD:** I believe that's just a table  
16          -- and Janet, you just put that for talking.

17          **MS. WESTBROOK:** This is Janet. Yes, that was  
18          drawn from those papers that you all cited in  
19          here and so forth, and yes, that's just to kind  
20          of illustrate the point.

21          **MR. BELL:** So your contention is -- this is May  
22          of '48, that your contention is then that these  
23          May '48 days are more indicative of what the  
24          early period was like. Is that correct?

25          **MR. RUTHERFORD:** Well, I think -- this is LaVon

1           again, and there is a -- there is air dust data  
2           from January of '48, as well, that's not  
3           included on that report, on that table.

4           **MR. BELL:** And is that also on the site  
5           research --

6           **MR. RUTHERFORD:** Yes, it's on the site research  
7           database.

8           **MR. BELL:** Well, I'm still having a hard time  
9           stretching that back from even early 1948 to  
10          this period when nobody was around watching  
11          what they were doing, not making sure they had  
12          respirators on, no rad controls --

13          **MR. RUTHERFORD:** Respirators aren't an issue.  
14          We've already addressed --

15          **MS. WESTBROOK:** This is --

16          **MR. RUTHERFORD:** -- respirators are not  
17          considered in the TBD.

18          **MR. BELL:** Well, that's true, but I...

19          **MS. WESTBROOK:** This is Janet. That respirator  
20          issue, they were worn inconsistently, but it's  
21          not as though nobody ever wore them --

22          **MR. BELL:** That's true.

23          **MS. WESTBROOK:** -- but not as though  
24          frequently, even in the '40's, and they'd go  
25          there, you know, Captain This and Lieutenant

1           That would go visit and they'd say oh, yeah,  
2           well, you know, in this area we had to remind  
3           them to wear their respirators. But apparently  
4           in other areas they were wearing the  
5           respirators or they would have said --  
6           mentioned those as areas where they had to re--  
7           it's stuff like that that -- that makes one  
8           understand that -- that respirator-wearing was  
9           inconsistent, everybody says so, but it wasn't  
10          as though they were never worn at all.  
11          And as far as nobody was watching them so they  
12          were just slopping around and so forth, I think  
13          that's a little bit hyperbolic to say that. I  
14          -- I do believe that under the press of meeting  
15          the quota or whatever, meeting the production,  
16          they probably cut corners and so forth. But I  
17          don't think they were just willy-nilly, you  
18          know, workers and supervisors just letting  
19          everything go to hell.

20          **MR. BELL:** Well, let me take just something off  
21          your chart here and see if I can cross it with  
22          something I noticed here they have in ore  
23          production category here. What I'm looking at  
24          is you have at the bottom of this table a range  
25          of exposure for the ore room, cleaning ore

1 drums --

2 **MS. WESTBROOK:** Uh-huh.

3 **MR. BELL:** -- ranging from 1,710 to 127,000 dpm  
4 per cubic meter with an average of 64,400 dpm  
5 per cubic meter for 30 minutes. If I go into  
6 the table over here, which is supposed to be  
7 used --

8 **MS. WESTBROOK:** Which table?

9 **MR. BELL:** This is your table 21, which is to  
10 be used for the period 1942 to 1946, the  
11 highest value that I can find for anybody is a  
12 TA7 unloader operator at 13,000 dpm per cubic  
13 meter, and yet here's evidence of something,  
14 you know, three times or four times that. And  
15 the question is, why -- why aren't these  
16 reflected better in this table for the early  
17 period, because we know, from some of these  
18 things we've done, that those data are  
19 available and could be looked at and summarized  
20 maybe in a better fashion.

21 **MS. WESTBROOK:** This is Janet, and not all of  
22 the data -- that data, for example, I think  
23 came on the O drive late, so it may not be  
24 reflected in that table at all. I'm not sure  
25 whether -- how much I revised that table, but I

1 do know that I revised those tables when the  
2 new material came in the O drive in the spring  
3 of 2004. So you know, in answer to your  
4 question, you say why don't they reflect it,  
5 well -- but that's beside the point. Your  
6 point was why aren't we taking those maxima  
7 into account, and so --

8 **MR. BELL:** Well, even averages.

9 **MS. WESTBROOK:** -- I'll -- well, we'll re--  
10 double-check those things to make sure we took  
11 all those into account, but back to your point  
12 about the maxima, I still -- what would it --  
13 what would I need to do to the TBD to  
14 incorporate the maxima. I feel that they --  
15 they did that. They took an arithmetic average  
16 and they commented on why they did it.

17 **MR. BELL:** I'm not even talking about the  
18 maximum. Some of these are much larger. I'm  
19 talking about the average they have here. I  
20 mean here's a -- here's an average for dust  
21 from the slide valve on a hopper pulverizer.  
22 Now I may not be --

23 **MS. WESTBROOK:** That's one step for their --  
24 his whole day.

25 **MR. BELL:** I agree. I agree, but there is --

1           there's other ones, like dumping D-7 --

2           **MS. WESTBROOK:**   Dumping --

3           **MR. BELL:**   -- the average is 82 -- 823,000 dpm  
4           per cubic meter.  Now obviously that may not be  
5           a sustained thing, but it's there.  Okay?  
6           People look at that and they say well, you're  
7           telling me it's -- you know, it's a tenth of  
8           that, or something.  And this is supposedly an  
9           average.  I'm not talking about the max, which  
10          is 2,870,000.  But you know, it just doesn't  
11          jive as well.

12          **MS. WESTBROOK:**  This is --

13          **MR. BELL:**  It needs to be explained better.

14          **MS. WESTBROOK:**  This is Janet, and you're  
15          saying to it as though -- people will read  
16          this, people will not understand, although this  
17          is a technical document written for technical  
18          people.  Obviously an informed lay person could  
19          get a lot out of the TBD, but I don't  
20          necessarily think it should be written at the  
21          level that everybody could understand where the  
22          numbers came from, could look at one of those  
23          documents and say look at this big number, it's  
24          way higher than this number I see in the TBD,  
25          why is that?  I don't necessarily think that --

1           this is just my personal opinion now, that this  
2           TBD has to be accessible to every level.  Okay?  
3           It has to be intelligible to a reasonable  
4           level, but it doesn't have to be accessible to  
5           every level if it's --

6           **MR. BELL:**  Okay, I'm going to turn it around a  
7           little bit, then.  This is --

8           **MS. WESTBROOK:**  -- is my thought, as the  
9           author.

10          **MR. BELL:**  Okay.  My thought is, if I were a  
11          dose reconstructor working on this, and I went  
12          into your table and it said for this particular  
13          job, this is what I should use for '42 to '46,  
14          and I was not instructed to be cautious, that  
15          there might be variations in that, I would tend  
16          to use what's in your table.  I wouldn't be  
17          aware, and I probably wouldn't do the research  
18          to know that for dumping D-7 there's a  
19          potential for much higher dose, and -- and I  
20          should maybe consider that in my dose  
21          calculations.  And I don't know how to draw the  
22          dichotomy between the two, but as a dose  
23          reconstructor, somehow I should be made aware  
24          that in these tables there are potentials much  
25          higher than that and I should evaluate that in

1           some way.

2           **MS. WESTBROOK:** Tom, I -- this is Janet. I  
3           don't see how there being a momentary high,  
4           which when averaged into its step, comes down  
5           lower and then when averaged in -- weight-  
6           averaged -- weighted, averaged into his whole  
7           day, comes down lower, I don't see how that's  
8           inconsistent -- logically inconsistent.

9           **MR. BELL:** This doesn't say a momentary high.  
10          It says an average.

11          **MS. WESTBROOK:** Certainly, but they were taking  
12          multiple samples over the period of the  
13          procedure. See, they're doing one step there,  
14          and it lasted as long as it says. I think it  
15          says ten minutes.

16          **MR. BELL:** They took four samples or something  
17          --

18          **MS. WESTBROOK:** Okay.

19          **MR. BELL:** -- over a period of time.

20          **MS. WESTBROOK:** Okay, so one of them was way  
21          high and the other three weren't.

22          **DR. NETON:** Could I just intervene here 'cause  
23          --

24          **MS. WESTBROOK:** Absolutely.

25          **MR. BELL:** Okay. All right.

1           **DR. NETON:** I'm sorry, I stepped in the middle  
2 of this. I might not understand what this --  
3 it sounds like we're discussing the use of  
4 time-weighted averages versus instantaneous  
5 highs that were measured.

6           **MR. BELL:** Is that what those are,  
7 instantaneous highs?

8           **DR. NETON:** Not instantaneous, they are --

9           **MR. BELL:** It says an average of four samples.

10          **DR. NETON:** It's an average of four samples for  
11 that work activity, but a person's work  
12 activity -- I don't think you're going to find  
13 a guy whose job was dumb drummer -- drum dumper  
14 --

15          **MR. BELL:** Dumping drums of D-7.

16          **DR. NETON:** -- eight hours a day for five days  
17 a week. And so if -- if we are forced to use  
18 the highest value for the entire period, I  
19 think that would be an unreasonably high  
20 estimate.

21          **MR. BELL:** I'm only talking about the average,  
22 not the highest. The highest is 2,800,000.

23          **DR. NETON:** I'm talking about the average --  
24 what we're saying is -- and correct me if I'm  
25 wrong, Janet --

1           **MR. GRIFFON:** You're saying that -- you're  
2           saying that the average for that task --

3           **DR. NETON:** That task, but --

4           **MR. GRIFFON:** -- and the task is a five-minute  
5           task or something like that.

6           **DR. NETON:** Of a person's day to day  
7           activities, and I don't know what this job  
8           category is, but presumably some job where a  
9           person would do certain tasks. And so we've  
10          developed these distributions that say okay, if  
11          you are a -- a laborer, your job activities  
12          encompass these various tasks and here is what  
13          the distribution of your exposures are, which  
14          would include those things. I mean we -- we  
15          ran into this issue with Mallin-- at Bethlehem  
16          Steel, same thing, time-weighted averages  
17          versus instantaneous -- clearly those are  
18          instantaneous. You dump a drum, it's -- for  
19          uranium, it's going to last maybe a half-hour  
20          or an hour at the most at a high level. It's  
21          going to drop down and not be there. So I --

22          **MR. BELL:** Well, then explain that in your TBD.

23          **DR. NETON:** Exactly, that's what I'm saying --

24          **MR. RUTHERFORD:** We actually have air samples  
25          that show that. We have air samples that show

1           when it was dumped, the concentrations, the air  
2           samples --

3           **MR. BELL:** -- sampling and tell somebody that  
4           so they -- I'm still working towards a better  
5           understanding of what the data means.

6           **DR. NETON:** I totally -- and Tom, I think we're  
7           in total agreement that we probably need to  
8           better explain why --

9           **MR. GRIFFON:** To go back to --

10          **MR. BELL:** -- the new Rev. 1.

11          **MR. GRIFFON:** To go back to Janet's point  
12          before -- before you say it again 'cause you've  
13          said it several times, I think just -- just  
14          maybe an example of one of the higher averages,  
15          and show the different tasks that were involved  
16          and how that average --

17          **MR. BELL:** Comes out in --

18          **MR. GRIFFON:** -- was calculated in your table,  
19          'cause I know you're going to say I don't want  
20          to -- if I add an appendix, I have to show how  
21          all these job averages --

22          **DR. NETON:** And that sounds very reasonable.

23          **MR. GRIFFON:** -- I got this much data, but a  
24          couple of examples of how those were derived  
25          based on task data and the task samples are

1 very high, and use that 2,000,000 one in there  
2 or whatever to show that yes, we are  
3 considering this high data, we're not just  
4 disregarding it. It's in this overall eight-  
5 hour time-weighted average.

6 **DR. NETON:** That's not a problem.

7 **MR. GRIFFON:** You know, 'cause -- 'cause he's  
8 right that people know these --

9 **DR. NETON:** I know it adds a lot more work --

10 **MS. WESTBROOK:** No.

11 **MR. GRIFFON:** No.

12 **MS. WESTBROOK:** This is Janet.

13 **MR. GRIFFON:** That's why I said examples.

14 **MS. WESTBROOK:** All I'd need to do would be to  
15 copy something like that in there. But see,  
16 (a), I question the need to do so; (b), I  
17 question the interpretation that might be put  
18 upon it, no matter how I ring it around with  
19 explanations and interpretations. I think it  
20 would create more hassle than it would solve.  
21 And third, don't worry -- I mean, you know, if  
22 this thing came out at 350 pages instead of  
23 about 250 now, lots of pages don't bother me.  
24 I'm accused of being --

25 **MR. GRIFFON:** Job security.

1           **MS. WESTBROOK:** -- really wordy, you know, so -  
2           - oh, no, no. But it's just that everybody's  
3           worst fears about me would be confirmed if I  
4           add too much. But I really don't think it's  
5           necessary to give an example. If my peer  
6           reviewers understand the time-weighted average,  
7           and you guys -- you auditors understand the  
8           time-weighted average, and the Board  
9           understands the time-weighted average, why does  
10          it matter --

11          **MR. GRIFFON:** Well, your customer has to  
12          understand, yeah.

13          **MS. WESTBROOK:** Who is my customer?

14          **MR. GRIFFON:** The claimant.

15          **MS. WESTBROOK:** Oh, no. Oh, no. My customer -  
16          -

17          **MR. GRIFFON:** There's a lot of customers.  
18          There's a lot -- there's a lot --

19          **DR. NETON:** I'd like to intervene here and take  
20          executive -- but yeah, we have to address a lot  
21          of stakeholders, that's clear.

22          **MR. GRIFFON:** Yeah.

23          **MS. WESTBROOK:** Stakeholders, that's --

24          **DR. NETON:** Stakeholders, customers, whatever  
25          you want to call them, there are a lot of

1 people that need to understand what we've done.

2 **MR. GRIFFON:** Yeah.

3 **DR. NETON:** Advisory Board, claimants, DOL --  
4 everybody.

5 **MR. GRIFFON:** Right, right.

6 **DR. NETON:** And to the extent that we can  
7 document it a little better, I think it is --  
8 it is important for us to do that. I also can  
9 see Janet's point that we don't want to get  
10 down into the weeds on minutiae and explain  
11 fundamental health physics concepts because  
12 that --

13 **MR. BELL:** It's too hard to do.

14 **DR. NETON:** It would make it so unwieldy that  
15 we'd never get anything done. But -- but  
16 clearly an experienced consulting organization  
17 like SC&A and the SC&A team, if they go in and  
18 you guys have trouble understanding, as health  
19 physicists, that to me sends a flag that we  
20 need to do a better job explaining what's in  
21 there. So I don't -- I don't see that there's  
22 an issue here and we'll -- we'll...

23 **MS. ROBERTSON-DEMERS:** Can I add something to  
24 this example? It's not real clear to me when  
25 you start to condense the job titles, going

1 from the AEC data to the tables, the air sample  
2 tables, whether you've taken the average of  
3 those three job titles, whether you've taken  
4 the maximum 'cause it looks like in one  
5 situation you may have taken an average, in  
6 another situation you may have taken a maximum,  
7 when you're looking at more -- when you've  
8 consolidated to more than one job title.

9 **MR. RUTHERFORD:** Okay.

10 **MS. ROBERTSON-DEMERS:** And if you include that  
11 translation in your example, it might help us.

12 **DR. NETON:** Sure.

13 **MS. WESTBROOK:** This is Janet, and it was the  
14 maximum and I thought I said that in the  
15 footnote, but if that's not clear I'll  
16 definitely say that in the footnote. But I was  
17 told that we had too many categories, it was  
18 too lengthy, too bulky if I broke it down, so  
19 that's why I wedged some job titles, but I took  
20 the top number of the job title in each case.

21 **DR. NETON:** See, that -- that --

22 **MS. WESTBROOK:** So I figured it was bunched --  
23 if they were bunched, they were all bunched  
24 higher or the same as they were.

25 **DR. NETON:** And that's where we need to make

1           sure that that's communicated because clearly,  
2           you know, it does not convey that. I've seen  
3           that several times now where we -- we're so  
4           close to it, we feel we're being extremely  
5           claimant favorable in all these things and, you  
6           know, a person who is new to the document reads  
7           it and doesn't pick up on that, and that's  
8           fine. I just wish when we'd couched these  
9           issues we would have -- state them in that way.

10          **MR. FLEMING:** Can I add one thing? This is  
11          Kenny, and I -- this goes back to the Advisory  
12          Board meeting that took place in December,  
13          which I read some of the transcripts on. It  
14          sort of goes in the -- sort of hand-in-hand  
15          with the -- I think the urinalysis data that  
16          was discussed there, the 24, 240, what's  
17          maximum, what's average, what -- you know, you  
18          had a zer-- bunch of zeroes and you had 240.  
19          What I looked at in these DWEs, the daily  
20          weight average exposure information cards,  
21          which I'm sure you've looked at -- you may even  
22          have them there looking at -- that they would  
23          break down, you know, the different tasks. And  
24          they'd have three, four, five -- I never saw  
25          two, not to say there wasn't, but usually

1 three, four or five or more samples that were  
2 taken. And they took a -- just a raw average,  
3 raw mean --

4 **MR. BELL:** You talking about these kinds of  
5 sheets where they didn't summarize them to come  
6 up with an average?

7 **MR. FLEMING:** I guess so -- where they'd have  
8 the job title and then they'd have the  
9 different tasks that a person would do.

10 **MR. BELL:** Yeah, it's the TA-7 unloader  
11 operator kind of thing -- and at the very end  
12 they come out with an average alpha  
13 concentration --

14 **MR. FLEMING:** Correct, yeah, and then what  
15 you'd see is as you're looking at it you'd see  
16 a -- a mean that was --

17 **MR. BELL:** Which job?

18 **MR. FLEMING:** -- three or the four or the five  
19 different sample result mean, and typically  
20 what you'd see -- say for three samples that  
21 you'd see a mean that would be somewhere in  
22 between the maximum -- actually -- actually --  
23 sometimes it was sort of towards the min,  
24 sometimes it was towards the actual average,  
25 you know, and sometimes it was up towards the

1 top or towards, you know, the maximum level. I  
2 guess the point I'm trying to make is that  
3 typical air sampling is a lognormal  
4 distribution, typically, you know, and -- and  
5 what you see there is -- are raw averages or  
6 means, which are typically much larger than --  
7 than a lognormal distribution mean. So not to  
8 say -- there's claimant favorable what I saw in  
9 that, so if you look at those and each one of  
10 the tasks with sort of maybe six, eight, ten --  
11 all the way through each one of those tasks, I  
12 think there's -- there seems to be an awful lot  
13 of positive bias in the result that's given as  
14 an average, and I think we'd all agree upon  
15 that if we assume that lognormal distribution  
16 is -- is proper for air sampling. And overall  
17 that that's probably the case in most all  
18 cases. I don't know if you can, you know,  
19 validate it and put a stamp on it in every case  
20 that that's the case, but in most cases I  
21 believe that that -- there's a lot of positive  
22 bias in those results.

23 **MS. ROBERTSON-DEMERS:** This is Kathy. I was  
24 wondering how thorough or how complete the  
25 monitoring of the workers was, both from a

1 external and internal dosimetry point of view.

2 **MR. RUTHERFORD:** And what do you mean, how  
3 complete?

4 **MS. ROBERTSON-DEMERS:** Well, did they just  
5 monitor production workers, did they monitor  
6 everybody at the plant, that type of thing.

7 **MR. RUTHERFORD:** Janet, I think -- she's  
8 probably better at answering this.

9 **MS. WESTBROOK:** This is Janet. But in -- when  
10 I was looking at the ORAU database, they had  
11 some office workers in there, everybody from  
12 the office workers and -- I forget the word  
13 they used, but it was janitorial all the way up  
14 to process people. And apparently some of the  
15 managers were included, as well -- maybe all of  
16 them.

17 **MR. RUTHERFORD:** And from what I've read -- and  
18 I haven't looked at all the data, but what I've  
19 read is, you know, obviously beginning in '46,  
20 you know, you had a majority of the workers  
21 that began to have film badging, dosimetry.  
22 And then, you know, the breath analysis, from  
23 what I read, was only -- it was workers that  
24 were deemed that had a high potential for  
25 exposure to the pitchblende -- potential radium

1           uptakes. And then the urinalysis program when  
2           it began, all this began at a certain level, a  
3           certain amount of work force or number of  
4           workers, but then ramped up into where most  
5           workers -- and I can't remember the year 'cause  
6           I actually had a regular report and it was  
7           actually one of the -- either Eisenbud or Mont  
8           Mason reports that talked about a year that it  
9           reached a high, and actually you can see this  
10          in a data table that we developed later on. In  
11          '49 it reached -- '49 to '55 time period the  
12          data is -- it consistently follows with the  
13          work force, the amount -- you know, were  
14          virtually -- most -- most people -- I won't say  
15          everyone, but most people were monitored during  
16          that time period, so...

17          **MR. ADLER:** This is Tim. I believe Mont Mason  
18          said -- I could be wrong, but I think in '49  
19          and then on, at least externally, he claimed  
20          everyone was monitored.

21          **DR. NETON:** We have some numbers, and these  
22          numbers were actually put together for the SEC  
23          petition evaluation, I believe --

24          **MR. RUTHERFORD:** Yes.

25          **DR. NETON:** -- is that correct? But -- and we

1           could certainly provide this table for you  
2           because it's not secret. It just is a  
3           compilation of information. But in '49 there  
4           were, for example, 676 employees. There were  
5           373 of those employees monitored for  
6           urinalysis. That's not individual samples,  
7           that's workers monitored, with 835 samples.  
8           And 686 employees -- well, 505 were monitored  
9           out of 676 workers, employees, so a substantial  
10          portion. The majority of the workers were  
11          monitored after a certain point. The early  
12          years, of course, is much more spotty. And one  
13          would assume if you're monitoring 80 percent of  
14          the workers that you're not targeting people  
15          who weren't exposed. I mean that's sort of --  
16          you know, I think there's some inferences in  
17          the write-ups that I've read that talk about  
18          monitoring the more exposed work force, but I  
19          don't think we have a procedure that talks  
20          about, you know, who -- who should be selected  
21          and monitored and when and why. If you're  
22          monitoring the overwhelming majority of your  
23          work force, I would suspect that you're  
24          monitoring --

25          **MR. RUTHERFORD:** And I think if you look at --

1           there were like 15 -- this is LaVon again.  
2           There were like 15 different reports that were  
3           from that -- from the '40's up through the  
4           later '50's that we read that are on the drive,  
5           and also that ORAU guys had found, as well as  
6           later epidemiological studies -- reports that  
7           also addressed the same issue of the work force  
8           that was monitored and where the focus was.  
9           And all of those documents indicated that, you  
10          know, the early years the focus was on high --  
11          high exposure areas -- not necessarily high  
12          exposed people in the early '40's, but more of  
13          high exposure areas and where they had issues -  
14          - or higher exposure areas. And then as the --  
15          in the '46, you know, time period -- time  
16          period, we move towards more of individual  
17          exposures or exposure monitoring, you know,  
18          from the film badging, air sampling's starting,  
19          you know. And then that ramped up to its full  
20          level when the health and safety program really  
21          kicked in in '48 and '49 period and up to '55.  
22          And then after '55 it actually dropped off a  
23          little bit, from the data that we've seen.  
24          Some of the -- and that could have been a  
25          factor -- a clear factor of production dropping

1 off that had shipped over to Weldon Springs in  
2 '57, '58 time period.

3 **MR. BELL:** This is Tom here. I did a review of  
4 the urinalysis data just quickly, took each one  
5 and figured out about how many pages per report  
6 and figured how many urine samples they took,  
7 and I think I got up to about 36,000 urine  
8 samples, so --

9 **MR. RUTHERFORD:** 34,000, that's pretty good.

10 **MR. BELL:** Is that what you guys had? Okay.  
11 Well, I was -- I was -- anyway, it shows --  
12 yes, you're right, in that period and that's  
13 why I haven't worried so much about the latter  
14 period. There was -- there was good urinalysis  
15 data being collected and you can gain a lot  
16 from that whether they've got a problem or not,  
17 but -- and their film badge data.

18 **MS. MUNN:** This is Wanda. I have a question.  
19 Approximately how many claims do we have from  
20 this Mallinckrodt (unintelligible)?

21 **THE COURT REPORTER:** Could you repeat that,  
22 Wanda? I'm sorry.

23 **MS. MUNN:** Approximately how many claims do we  
24 have from Mallinckrodt?

25 **DR. NETON:** About 600 claims, I believe.

1           **MS. MUNN:** About 600 claims?

2           **MR. RUTHERFORD:** Uh-huh.

3           **DR. NETON:** Was that 600 at Mallinckrodt or  
4 Iowa? I was just upstairs. I wrote it down,  
5 but I didn't bring it with me.

6           **MR. BELL:** You mentioned 40 have been  
7 processed.

8           **DR. NETON:** Forty have been processed, and I  
9 stand corrected. I was upstairs talking about  
10 something else, and five actually have been  
11 done where the probability of causation is  
12 going to be less than 50 percent. The last  
13 database I looked at said one. I don't know  
14 whether we've done more --

15           **MR. RUTHERFORD:** We can tell you here in just a  
16 second. I can get on --

17           **MR. BELL:** Print it out.

18           **DR. NETON:** It's right on our web site. Run  
19 out there and print it --

20           **MR. RUTHERFORD:** 303.

21           **DR. NETON:** 303? That makes sense. Yeah, 300  
22 -- 600 at Mallinckrodt --

23           **MR. BELL:** 303?

24           **DR. NETON:** Right, claims.

25           **MR. GRIFFON:** I'm assuming a lot of these

1 people didn't start work during this period of  
2 question, '42 through '55 or so or --

3 **DR. NETON:** That's correct. I think about 50  
4 or 60 started work in that time period. If you  
5 -- you've got to be careful 'cause, you know,  
6 you say '40 -- early '40's, '42 to '45 there's  
7 about 15, but people who worked '42 to say '48,  
8 I think there's about 50 or 60, something like  
9 that.

10 **MS. MUNN:** That's okay, I just --

11 **DR. NETON:** So just in general terms, I think  
12 it's about 300 claims, maybe 50 or 60 in that  
13 early -- before '58 -- '48 time frame.

14 **MR. BELL:** I think I saw a summary somewhere  
15 where it said there were about 3,500  
16 Mallinckrodt employees altogether over time.  
17 Does that make sense?

18 **DR. NETON:** I wouldn't be surprised.

19 **MR. BELL:** Something like that, ball park?

20 **MS. ROBERTSON-DEMERS:** This is Kathy. In your  
21 table where you talk about the number of people  
22 who were monitored, did you define in there how  
23 many zeroes there were?

24 **DR. NETON:** Not in that table, no.

25 **MS. ROBERTSON-DEMERS:** Do you have a feel for

1           that?

2           **DR. NETON:** No, I don't. How many -- how many  
3           mon-- how many were zeroes on the monitoring?

4           **MR. RUTHERFORD:** External, internal?

5           **MS. ROBERTSON-DEMERS:** Both.

6           **MR. RUTHERFORD:** All? Yeah, I don't know.

7           **DR. NETON:** I think you're referring to the  
8           Mont Mason assertion that people were assigned  
9           zero when they weren't in fact monitored. Is  
10          that what you're getting at there?

11          **MS. ROBERTSON-DEMERS:** Actually I'm just  
12          curious.

13          **DR. NETON:** Well, I don't know. Given that  
14          Mont Mason assertion, I think we need to be  
15          careful in those cases, and I fully expect that  
16          if zeroes were assigned we would treat them as  
17          not having been monitored.

18          Now your question is, of those monitored  
19          employees how many were zeroes. Now what I  
20          recorded there was not the number of individual  
21          records, but the individuals that had a  
22          monitoring record.

23          **MS. ROBERTSON-DEMERS:** Okay.

24          **DR. NETON:** Of course there's more monitoring  
25          records --

1           **MS. ROBERTSON-DEMERS:** Right, okay.

2           **DR. NETON:** So if -- I don't know how many of  
3 those that I quoted have all zeroes, let's put  
4 it that way. I don't know.

5           **MS. ROBERTSON-DEMERS:** I just would be  
6 interested --

7           **MS. WESTBROOK:** This is Janet. I think you  
8 have to be kind of careful about just assuming  
9 that zeroes were not monitored because in the  
10 early years when they first started doing the  
11 film badging, I think they had a little  
12 notation down at the bottom telling what zero  
13 means, and what it means is it was below their  
14 detection level, so what that means is not they  
15 weren't monitored, obviously, but they didn't  
16 see anything.

17           **DR. NETON:** Well, this is where we have to  
18 couch it against historical documents like the  
19 Mont Mason write-ups who make these assertions  
20 and then what makes sense from a health physics  
21 perspective because, Kathy, you know many times  
22 zeroes were written down for people who were  
23 monitored. It's just below the detection  
24 limit. So I guess I mis-spoke when I said we'd  
25 always assume it, but in context of what Mont

1           Mason write-up said, we need to be careful  
2           (unintelligible) err on the side of the  
3           claimant.

4           **MR. RUTHERFORD:** And we actually talked about  
5           that earlier, that we would add a -- you know,  
6           that we thought it probably would be a good  
7           idea to add something to that -- that, saying  
8           to look for that and --

9           **DR. NETON:** Yeah, make sure one...

10          **MR. GRIFFON:** But how is that -- I -- I  
11          understand from the DR perspective, but how --  
12          going back to a question I asked this morning,  
13          I think, and not to be repetitious, but how is  
14          that handled if you have zeroes for like those  
15          table -- where you estimated the picocuries per  
16          year, your intakes.

17          **MS. ROBERTSON-DEMERS:** Yeah, for the averages.

18          **MR. GRIFFON:** You had the 21 cases. Did you --  
19          I don't think you dropped zero data or, you  
20          know --

21          **MS. ROBERTSON-DEMERS:** In terms of --

22          **MR. GRIFFON:** -- when urine data --

23          **DR. NETON:** Well, that's something we'd have to  
24          look at. I don't -- I don't think we did.

25          **MR. GRIFFON:** I don't know that it's going to

1           have a major effect, but just a -- just a  
2           question.

3           **DR. NETON:** 'Cause these are good points, valid  
4           issues.

5           **MS. WESTBROOK:** This is Janet -- well, I was  
6           speaking of the film badge records, of course,  
7           earlier --

8           **MR. GRIFFON:** Yeah, I know, right.

9           **MS. WESTBROOK:** -- but as regards the  
10          urinalysis, my supervisor told me, when I was  
11          doing the IMBA runs for that, to assume that  
12          the zero meant that it was like the limit of  
13          detection.

14          **MR. GRIFFON:** Detection, right.

15          **MS. WESTBROOK:** So it was assigned the limit of  
16          detection as a value and it wasn't thrown out  
17          as a zero.

18          **MR. GRIFFON:** Right. Right.

19          **DR. NETON:** I'm not sure that still answers  
20          your question because there's --

21          **MR. GRIFFON:** No, right.

22          **DR. NETON:** -- there's an issue of were these -  
23          - were these resolved with real monitoring data  
24          or not. We need --

25          **MR. GRIFFON:** That's certainly --

1           **DR. NETON:** -- we need to address --

2           **MR. GRIFFON:** -- more conservative than  
3 assuming zeroes there or whatever, yeah, so --

4           **MS. WESTBROOK:** Well, this is --

5           **MR. GRIFFON:** -- at least we know how it was  
6 handled.

7           **MS. WESTBROOK:** -- Janet. But -- but the  
8 experts on that would be those ORAU folks. Dr.  
9 Betsy Ellis could probably tell you chapter and  
10 verse on that, so at least on Mallinckrodt and  
11 the other, what, three sites they studied, they  
12 probably know the answer to that.

13           **DR. NETON:** We take that comment. Sounds good.  
14 Sounds like you guys made tremendous progress.  
15 Maybe it's because of me not being here -- in  
16 spite of or because of.

17           **MR. GRIFFON:** There was one -- did we skip  
18 eight or something --

19           **MR. RUTHERFORD:** We skipped six --

20           **DR. NETON:** There was one that I asked to be  
21 held because it was an issue that's also  
22 relevant to Bethlehem Steel.

23           **MR. BELL:** Yes, right.

24           **DR. NETON:** And I wanted to be part of the  
25 discussion so that I have a clear understanding

1 of what the comment really is. So is it okay  
2 to go back to six now, then?

3 **MR. RUTHERFORD:** Uh-huh, yeah.

4 **DISCUSSION TOPIC 6**

5 **DR. NETON:** It talks about further discussion  
6 with respect to nasal versus oro-nasal  
7 breathing. As I mentioned, this comment was  
8 also made in Bethlehem Steel. And we do  
9 increase the breathing rate for workers -- and  
10 I'm not exactly sure, I'll be honest, what we  
11 used at Mallinckrodt for the breathing rate,  
12 whether it was light activity or heavy work.  
13 But what I'm concerned about is I'm not sure I  
14 understand the comment, and that's what I'm  
15 trying to ask. One has to differentiate  
16 between light work and heavy work and light  
17 exercise and heavy exercise. They're two  
18 different things.

19 Heavy work, as defined by ICRP-66, is seven-  
20 eights light exercise, one-eighth heavy  
21 exercise. So that means that a person will  
22 breathe three cubic meters per hour for one  
23 hour at heavy work, heavy exercise, and 1.2  
24 cubic meters per hour for -- for light  
25 exercise, which is well and above what a person

1 would breathe sitting. Now if one takes the  
2 average of those two -- not the time-weighted  
3 average, but the weighted average -- you end up  
4 with 1.7 cubic meters per hour for heavy work.  
5 Now, that one hour of heavy breathing -- that  
6 one hour of heavy exercise at three cubic  
7 meters per hour, which is a very heavy thing.  
8 I mean that's sort of like jogging around --  
9 more than jogging, I think -- would -- assumes  
10 that a person is a mouth breather -- I've  
11 forgotten the number -- 40 or 50 percent of the  
12 time. So as the work activity increases, there  
13 is an assumption of mouth breathing in the  
14 heavy work category.  
15 Now, we have chosen to use heavy work for the  
16 maximum exposed worker. I'm not sure what the  
17 comment says then, because it says we should  
18 consider mouth breathing when heavy work does  
19 assume a certain fraction of mouth breathing.  
20 Are we to infer that SC&A says that we should  
21 go beyond what's considered heavy work and be  
22 ultra-heavy work or super-heavy work or hyper-  
23 heavy work? I'm not sure, there is no  
24 definition.  
25 And I would also point out that there is no

1 current commercial software available to go  
2 beyond that right now, if -- if not -- you  
3 know, there's two default assumptions we have  
4 in the ICRP-66, heavy work and light work. So  
5 I'm asking for some clarification on what the  
6 comment really is saying.

7 **MR. BELL:** Well, I -- I think that we -- you're  
8 -- you're providing more information than I  
9 think we had available when we brought this up,  
10 but we were just concerned -- it appeared there  
11 was -- they were using a rather -- kind of an  
12 average nasal breathing rate and not -- I  
13 didn't -- I didn't get from that -- and maybe  
14 we need a little bit closer -- that -- that you  
15 did actually have heavy exercise component  
16 there, because what we heard from the folks  
17 that we talked to was that there were  
18 situations where they were stressed pretty  
19 heavily and they were working strenuously, and  
20 obviously their breathing was labored and they  
21 were probably mouth breathing more than they  
22 were nasal breathing.

23 **DR. NETON:** And that is actually built into the  
24 heavy worker model, which is three cubic meters  
25 per hour, I think --

1           **MR. BELL:** You're saying three cubic meters is  
2           already built into --

3           **DR. NETON:** Yes.

4           **MR. BELL:** -- your process?

5           **DR. NETON:** Yes, if you say -- if you -- by  
6           definition, a person is a heavy worker, they  
7           breathe three cubic meters per hour for one  
8           hour of every shift and breath -- I think it's  
9           40 or 50 percent through their mouth. That's  
10          the differentiation between light exercise and  
11          heavy exer-- it's confusing, I'll admit. The  
12          ICRP model --

13          **MR. GRIFFON:** It's in there, yeah.

14          **DR. NETON:** -- but it's all in there and --

15          **MR. BELL:** Where is it -- where is it discussed  
16          in that, do you know?

17          **DR. NETON:** In ICRP-66?

18          **MR. BELL:** No, in your TBD.

19          **DR. NETON:** Oh, no --

20          **MR. GRIFFON:** It's by definition.

21          **DR. NETON:** -- we don't -- we assume by  
22          definition --

23          **MR. BELL:** Oh, by definition.

24          **DR. NETON:** -- it's a default ICRP --

25          **MR. BELL:** Oh, I see.

1           **DR. NETON:** -- value.

2           **MR. BELL:** Oh, I see. I see, okay.

3           **DR. NETON:** And I'm just asking, you know, for  
4           a little bit more guid-- are you saying that we  
5           should go outside of the standard default heavy  
6           worker model and go above and beyond that,  
7           which there really only two flavors in ICRP-66  
8           -- we could develop a custom model. That would  
9           require a substantial effort. I don't know of  
10          anyone in the world that has a production  
11          calculation that does that.

12          **MR. FITZGERALD:** Jim, you said one model is  
13          the seven-eighths versus one-eighth.

14          **DR. NETON:** That is the heavy -- the definition  
15          of heavy worker in ICRP-66.

16          **MR. FITZGERALD:** Seven-eighths and one-eighth.

17          **DR. NETON:** Correct, light exercise for seven  
18          hours, heavy exerci--

19          **MR. FITZGERALD:** The other -- the other model  
20          is -- that's heavy.

21          **DR. NETON:** Yeah, light exercise --

22          **MR. FITZGERALD:** Light worker.

23          **DR. NETON:** -- is -- a light worker is -- I  
24          don't have it on the tip of my finger, but it's  
25          so much light exer--

1           **MR. FITZGERALD:** Cubic per hour.

2           **DR. NETON:** -- so much light exercise --

3           **MR. FITZGERALD:** Right.

4           **DR. NETON:** -- and so much sitting, there's a  
5           certain portion for sort of standing around.  
6           And that equates -- that average comes out, the  
7           weighted average, to 1.2 cubic meters per hour  
8           for light exercise -- or light work -- I get  
9           confused myself -- and heavy work is 1.7 cubic  
10          meters per hour. They're both composites of a  
11          work profile.

12          **MR. GRIFFON:** Right.

13          **DR. NETON:** I hate to use that term, "profile,"  
14          but a work description, work process.

15          **MR. BELL:** And the heavy work is the same as  
16          this seven-eighth light, one-eighth heavy? Is  
17          that --

18          **DR. NETON:** That's correct, heavy exercise.

19          **MR. BELL:** These two.

20          **DR. NETON:** So you take three cubic meters per  
21          hour for one hour and 1.2 cubic meters per hour  
22          for seven hours, and the weighted average is  
23          1.7, which is what we use for the maximum  
24          exposed worker breathing 50 percent through  
25          their mouth for one hour of those eight,

1           because when you breathe at three cubic meters  
2           per hour -- there are people who are habitual  
3           nose breathers, by the way, who, no matter what  
4           work level, they'll breathe through their nose.  
5           I know more about this now than I ever cared  
6           to, but -- so I'm looking for some  
7           clarification as to what we're really trying to  
8           say.

9           **MR. FITZGERALD:** Well, I think there's some  
10          uncertainty about whether the one-eighth or 12-  
11          and-a-half percent of the work day is  
12          sufficient as a definition of heavy work and  
13          it's in the ICRP model, and certainly I think  
14          we wouldn't oppose trying to substitute it or  
15          do a custom for that model for a heavy  
16          industrial job category. I think it's the open  
17          question that we're still considering this is  
18          whether the one -- the one-eighth heavy versus  
19          seven-eighths light, does that characterize,  
20          for example, a steel worker.

21          **DR. NETON:** I can tell you in the world's  
22          greatest protection programs, I don't know of  
23          anyone who's gone outside of those paradigms,  
24          but --

25          **MR. FITZGERALD:** Okay. Well, I think we're,

1           again, thinking out loud as far as whether that  
2           characterizes a steel worker in a -- in that  
3           kind of a -- 'cause I think it's the closest  
4           analog, but we'll give it further thought, but  
5           -- I'm not sure we can decide at the table, but  
6           I think --

7           **DR. NETON:** I just bring that up, and for  
8           clarification, if you would clarify the comment  
9           in the report or to us what your thinking is  
10          there because it's -- it's confusing to me if  
11          we start modeling --

12          **MR. FITZGERALD:** Obviously the -- the specifics  
13          provided in the Bethlehem Steel report where  
14          this was actually given even more treatment, it  
15          is still not sufficient to resolve this.

16          **DR. NETON:** No, in the Bethlehem Steel report  
17          the maximum exposed worker was a heavy worker.

18          **MR. FITZGERALD:** Right.

19          **DR. NETON:** And I think you'll see that we're  
20          going to be modifying that to be full-time  
21          heavy work and not allow for the light exer--  
22          light worker, but -- different issue.

23          **MR. FITZGERALD:** This case, the default is the  
24          heavy worker as defined by the model.

25          **DR. NETON:** I'm not sure, is it? I don't know.

1           **MS. ROBERTSON-DEMERS:** Well, let me --

2           **MR. FITZGERALD:** I'm just try-- I think that --  
3           I think that's probably where we're having a  
4           little confusion over this.

5           **MS. ROBERTSON-DEMERS:** The breathing rate  
6           assumed was 1.4 meters cubed per hour.

7           **DR. NETON:** 1.4 in which document?

8           **MS. ROBERTSON-DEMERS:** In the Mallinckrodt  
9           document.

10          **MR. BELL:** That's your TBD.

11          **DR. NETON:** Okay.

12          **MS. WESTBROOK:** The old one.

13          **DR. NETON:** The old one, okay. But 1.4, I'm  
14          not sure how we arrived at 1.4 then.

15          **MR. GRIFFON:** That's kind of in between, yeah.

16          **DR. NETON:** It doesn't make -- it should either  
17          be 1.2 or 1.7.

18          **MR. BELL:** 1.7, yeah.

19          **DR. NETON:** Those are the two definitions of  
20          work.

21          **MS. WESTBROOK:** This is Janet. I put in the  
22          document the number that I was directed to do.  
23          Now the -- at some point there was a change  
24          made, so the new one and all the other TBDs  
25          I've written and know of use the other number

1 in them.

2 **DR. NETON:** 1.2 and 1.7 depending on --

3 **MS. WESTBROOK:** No, I had that as a two-tier,  
4 and I was told that -- our direction from NIOSH  
5 -- from NIOSH -- was to take it out, and so  
6 that's why you see only one number there. And  
7 -- and I forget what the number is, and I'm  
8 sorry, I'm just terrible with numbers, but --

9 **DR. NETON:** Okay.

10 **MS. WESTBROOK:** -- but whatever that is has  
11 been used -- I've been using consistently --

12 **DR. NETON:** I think I know --

13 **MS. WESTBROOK:** -- for my TBDs.

14 **DR. NETON:** I think I -- okay.

15 **MS. WESTBROOK:** I'm confused.

16 **DR. NETON:** I think I know what it's coming --  
17 that sounds to me like an amalgam of the 1.2  
18 and the 1.7.

19 **MR. GRIFFON:** Yeah.

20 **MR. RUTHERFORD:** Yeah.

21 **DR. NETON:** You've got 1.9 and 1.45, so it's a  
22 combination of 50-50.

23 **MR. BELL:** Yeah.

24 **DR. NETON:** Now what that does not consider,  
25 though -- this is -- this is, I think, true.

1           That intake rate that you put in the TBD was  
2           used based on either air concentration data and  
3           you believe the air concentration data and you  
4           can increase the intake to come up with a dose.  
5           But what that does not consider is the 50  
6           percent mouth breathing at 40 percent -- at the  
7           higher intake rate that really substantially  
8           increases the dose for that fraction, because  
9           you circumvent the nasopharyngeal passages and  
10          they act as a pretty efficient filter. So we  
11          need to -- we need to reconsider that and how  
12          we take these generic intake rates, breathing  
13          rates, and apply them to dose conversion  
14          factors without considering the deposition  
15          parameters unique to heavy mouth breathing.

16          **MS. WESTBROOK:** Obviously that's going to be an  
17          issue to be decided at the highest levels.

18          **DR. NETON:** Yeah, and I just have to say  
19          scientifically -- scientifically, one needs to  
20          make that adjustment. Now my question  
21          originally, though, was --

22          **MR. FITZGERALD:** Yeah.

23          **DR. NETON:** -- is heavy breathing an  
24          appropriate metric or are we to assume  
25          something else?

1           **MR. FITZGERALD:** No, and again, the question is  
2           how Bethlehem Steel -- is the heavy breathing  
3           ICRP model, the 1.7, I guess, is that an  
4           appropriate --

5           **DR. NETON:** Right, and that's a Bethlehem Steel  
6           issue, but I guess what I'm --

7           **MR. FITZGERALD:** What I'm saying is this sort  
8           of carries over and -- with 1.7 as the -- as  
9           the model here be appropriate.

10          **MS. ROBERTSON-DEMERS:** There is another element  
11          to this, and that is the element of ingestion.

12          **DR. NETON:** Okay.

13          **MS. ROBERTSON-DEMERS:** Okay?

14          **DR. NETON:** That's another question I had,  
15          actually. All -- all mouth -- all breathing  
16          mouth -- all breathing models assume ingestion.  
17          Anything that's deposited in the nasopharyngeal  
18          region, the upper airways, is all ultimately  
19          assumed to be ingested and that dose is  
20          considered in -- in the calculation. That's  
21          just part of the standard ICRP approach.  
22          Ingestion from inhalation is --

23          **MR. GRIFFON:** From inhalation.

24          **DR. NETON:** -- automatically considered.

25          **MR. GRIFFON:** Be clear with that. I think

1 she's talking about a separate route -- right?  
2 -- of ingestion --

3 **DR. NETON:** Well, we're talking about  
4 inhalation here, but --

5 **MR. GRIFFON:** Oh, okay.

6 **DR. NETON:** -- I mean inhalation models in ICRP  
7 automatically account for the amount that's  
8 swallowed --

9 **MR. GRIFFON:** That's right, and --

10 **DR. NETON:** -- and absorbed in the GI tract,  
11 automatically.

12 **MS. ROBERTSON-DEMERS:** Now is that the amount  
13 coming back up from the lungs --

14 **DR. NETON:** Well --

15 **MS. ROBERTSON-DEMERS:** -- or the amount going  
16 in?

17 **DR. NETON:** Well, there's a certain amount --  
18 there's an intake, right? You breathe a  
19 certain amount and so much gets deposited, the  
20 uptake. They will consider the uptake, they'll  
21 deposition all in ET-1, ET-2 and all the other  
22 airways, and then a certain percentage of that  
23 is cleared through the mucocilliary ladder and  
24 -- by swallowing from the upper airways,  
25 ingested, and then that dose is considered,

1 auto-- it's just a standard part of the model.

2 **MR. BELL:** ICRP-66, it does?

3 **MR. GRIFFON:** Yeah.

4 **DR. NETON:** In general. They always assume  
5 that -- that the ingestion -- ingestion due to  
6 inhalation is a standard part of mod-- I think  
7 that comment is in the -- in the review and I  
8 think that probably needs to be reconsidered.  
9 I mean it probably should be removed, but  
10 that's the comment. I think that was the  
11 comment. If that was the crux of it, it's  
12 automatically built into our calculation.

13 **MR. GRIFFON:** I thought you had another  
14 question about other ingestion doses for other  
15 --

16 **DR. NETON:** Well, there's another --

17 **MR. GRIFFON:** -- other avenues, from your hand,  
18 from your --

19 **DR. NETON:** Yeah, but that's a different issue  
20 and that's not on -- that section I believe is  
21 marked reserved, if I'm not mistaken -- is it  
22 not?

23 **MR. GRIFFON:** Okay.

24 **MS. WESTBROOK:** Well, in there.

25 **DR. NETON:** Right, we need to be --

1           **MR. FITZGERALD:** Section -- section eight.

2           **DR. NETON:** -- talking about Rev. 0. I mean  
3 let's be clear.

4           **MS. WESTBROOK:** Sorry.

5           **MR. FITZGERALD:** Section eight.

6           **DR. NETON:** It's marked reserved. It will be  
7 modeled explicitly in the next --

8           **MR. BELL:** Rev. 1?

9           **DR. NETON:** -- revision. We've -- as health  
10 physicists, we've sort of discounted ingestion  
11 as any serious pathway, but in the claimant  
12 dose reconstruction business, it needs to be in  
13 there, clearly, to demonstrate -- even if it's  
14 several millirem -- that we've considered it as  
15 a pathway. We learned that lesson early on in  
16 the Bethlehem Steel profile.

17           **MR. FITZGERALD:** Well, for issue six, it sounds  
18 like you may go back and revisit the -- the  
19 intake value you're using as far as --

20           **DR. NETON:** Yes.

21           **MR. FITZGERALD:** -- inhalation.

22           **DR. NETON:** I believe -- I believe we need  
23 to...

24           **MR. FITZGERALD:** And our -- from our stand,  
25 what we're going to do is sort of put our heads

1 together again on this question, particularly  
2 with Bethlehem Steel as a backdrop, really, on  
3 this particular question and clarify, you know,  
4 if not ICRP, then what and why -- okay? -- just  
5 to make sure that's very crisp before we put  
6 that out.

7 **DR. NETON:** And I think one thing you need to  
8 look very carefully at what three cubic meters  
9 per hour is. It's a fairly substantial  
10 inhalation rate.

11 **MR. FITZGERALD:** Okay.

12 **DR. NETON:** And 1.2 cubic meters is not what  
13 you used to think of as just sitting at your  
14 desk. It is light exercise.

15 **MS. ROBERTSON-DEMERS:** Like sweeping?

16 **DR. NETON:** Yeah, it could be sweeping, sure.

17 **MS. ROBERTSON-DEMERS:** Or something like that?

18 **DR. NETON:** I mean it's in the default  
19 descriptions and I think you guys --

20 **MR. FITZGERALD:** Yeah.

21 **DR. NETON:** -- also quoted the supplement,  
22 which has all kinds of neat information about  
23 how they arrive at those -- what I couldn't  
24 find in there is a real flesh-out of does it  
25 apply to steel workers.

1           **MR. FITZGERALD:** Right.

2           **DR. NETON:** And clearly they weren't intending  
3 to discuss all occupations, but heavy work is  
4 heavy work, and I don't know whether we want to  
5 define steel workers as ultra-heavy work or  
6 not. I just want -- I'd like to get some  
7 clarification on that, and particularly for  
8 Bethlehem Steel because I need to get some  
9 issues resolved fairly quickly -- I know we're  
10 here to agree about Mallinckrodt, but since  
11 it's relevant, I brought it up today. I didn't  
12 think that you were going down another path,  
13 but --

14           **MR. FITZGERALD:** No, I think it's a similar  
15 path, but it raises a similar issue which is,  
16 you know, steel workers, does this capture the  
17 level of, quote -- and heavy work is such a  
18 judgmental thing. I mean I guess --

19           **DR. NETON:** Right.

20           **MR. FITZGERALD:** -- that's why I'm going back  
21 and trying to figure out what the analog is  
22 from the actual sampling.

23           **DR. NETON:** Steel workers, I mean do -- do --

24           **MR. FITZGERALD:** I would think that's a pretty  
25 heavy job.

1           **MS. MUNN:** It is a pretty heavy job.

2           **DR. NETON:** I've worked at a steel mill. I  
3           didn't move the steel, but clearly there are a  
4           lot of cranes. There's a lot of manipulative  
5           devices -- I mean -- so I've no doubt that  
6           there's hard work involved. If it exceeds the  
7           ICRP default for heavy work, I really don't  
8           know.

9           **MR. FITZGERALD:** If any -- if any job category  
10          comes close, I would think a steel worker would  
11          be sort of up in that realm, but I don't know -  
12          - that's sort of like how many -- I have no  
13          idea.

14          **DR. NETON:** Right, and -- and where we draw  
15          that line.

16          **MS. MUNN:** It's certainly good to be hearing  
17          this discussion because one of -- one of my  
18          specific questions I had written down is on  
19          page 34, which is, you know, this oro-nasal  
20          breathing thing. Who decides what "fully  
21          addressed" means? What does "fully addressed"  
22          mean? When is it "fully addressed" and how?

23          **DR. NETON:** Well, and you know, to our -- I  
24          won't say defense, but to our thinking, you  
25          know, we assumed the ICRP defaults, unless

1           there was some compelling reason otherwise --  
2           and I guess we just felt in the early process  
3           that heavy breathing -- heavy work was heavy  
4           work, and it -- we -- this should not be  
5           weighed in the consideration, but if we have no  
6           software model to do dose reconstructions for  
7           anything outside heavy work at this point. I  
8           mean there just -- standard -- I mean the DOE  
9           bought into this, we bought into this. You  
10          know, the ICRP defaults fit the workers, and if  
11          we needed to go and go beyond that, it would  
12          require substantial modification to our  
13          software because you get into more deposition  
14          and breathing and -- I'm not -- I'm not  
15          suggesting that that should even weigh into  
16          consideration. But I think it does speak to  
17          the fact of how much -- how the -- how those  
18          two default parameters have been used  
19          consistently in most workplaces and -- and  
20          appear to cover -- cover the workers' exposure  
21          scenario.

22          **MS. MUNN:** But Jim, I think what my question  
23          was really trying to point out to me, in my own  
24          thinking, is is this not a policy issue that we  
25          need to resolve? Because it doesn't apply

1           simply to the Mallinckrodt issue that we're  
2           dealing with.

3           **DR. NETON:** No, it sounds like the heavy work  
4           definition maybe is a Bethlehem Steel issue.  
5           And going beyond heavy work for Mallinckrodt  
6           may or may not be an issue, I don't know. It's  
7           not clear from --

8           **MR. FITZGERALD:** Well, yeah, I guess it really  
9           goes back to -- you know, it's a subjective  
10          thing. How is heavy work defined. Is there an  
11          analog for the type of work that we're talking  
12          about. I personally wouldn't know if it was  
13          one-eighth or would one-fourth be closer. I  
14          think it goes back to how the -- how the ICRP  
15          default fractions were put together.

16          **DR. NETON:** Well, I tried to come up with that,  
17          but as you know, reading those documents, they  
18          stop short --

19          **MR. GRIFFON:** It's right here, yeah.

20          **MR. FITZGERALD:** But I do think the burd-- the  
21          burd-- I think it was a burden for us to at  
22          least be able to frame this up and provide some  
23          -- some basis for saying that --

24          **DR. NETON:** Well, that's right.

25          **MR. FITZGERALD:** -- they may not -- they may

1 not be adequate, and I think we need to think  
2 about that a little harder.

3 **DR. NETON:** And I guess to our way of thinking  
4 --

5 **MS. MUNN:** They may be.

6 **MR. FITZGERALD:** They may be.

7 **MS. MUNN:** They may be quite adequate.

8 **MR. FITZGERALD:** Right, I understand.

9 **DR. NETON:** It's one thing to raise the issue  
10 and say what-if's, but without having any real  
11 substantial thing other than a supposition  
12 makes it difficult for us. We end up chasing  
13 down issues that -- you know, we believe we've  
14 done a reasonable dose reconstruction and we  
15 could what-if a lot of these things to death.  
16 And it would be nice, if SC&A were to make  
17 assertions, that they would back them up and  
18 say it -- in -- we -- in our experience, the  
19 steel workers breathe eight cubic meters per  
20 hour or something like that, and that NIOSH has  
21 not considered that, rather than say this is --

22 **MR. FITZGERALD:** Yeah, and I don't disagree. I  
23 think -- you know, this question of burden, I  
24 think in some cases our review should provide  
25 sufficient substantiation, even if it's the

1                   baton passing to you, to do the heavy lifting  
2                   of further research.

3                   **DR. NETON:** Exactly.

4                   **MR. FITZGERALD:** In other cases, clearly, you  
5                   know, we may just have some feedback from  
6                   workers or what-have-you, but would expect that  
7                   that should be investigated further. I think  
8                   in this case we should give more substantiation  
9                   why the ICRP default mechanism may not fit --

10                  **DR. NETON:** Right.

11                  **MR. FITZGERALD:** -- than I guess just  
12                  conjecture that, you know, the one-eighth may  
13                  not be adequate. So I think we need to look at  
14                  that a little further and maybe we can pick up  
15                  on this once we get a little bit more  
16                  information.

17                  **DR. NETON:** That's great. That's fair.

18                  **MS. ROBERTSON-DEMERS:** This is Kathy. I just  
19                  want to give you a heads-up. I do have a very  
20                  hard-to-read document from Mallinckrodt that  
21                  says that they assumed in their time-weighted  
22                  averages ten meters cubed per day.

23                  **MR. GRIFFON:** Ten meters cubed.

24                  **DR. NETON:** Well --

25                  **MR. RUTHERFORD:** Well, that --

1           **DR. NETON:** -- that's right, 'cause we -- you  
2 know, light exercise is 9.6 cubic meters.

3           **MR. GRIFFON:** Oh, yeah.

4           **MS. ROBERTSON-DEMERS:** So you may have to think  
5 of -- if you're going to adjust to heavy work,  
6 you may have to take that into account.

7           **DR. NETON:** Well, heavy work would exceed that.

8           **MS. ROBERTSON-DEMERS:** In the time-weighted  
9 average.

10          **MR. BELL:** He's saying heavy work --

11          **DR. NETON:** Oh, I see what you're saying in  
12 terms of -- well, no, it'd be proportionate.  
13 Right? I mean --

14          **MR. RUTHERFORD:** Yeah, it'd be --

15          **DR. NETON:** If you breathe the same -- you just  
16 scale the time-weighted average --

17          **MS. ROBERTSON-DEMERS:** Right, right, and that's  
18 what I'm saying.

19          **DR. NETON:** Sure. That would be -- yeah, that  
20 would be automatically adjusted for --

21          **MR. GRIFFON:** Yeah.

22          **DR. NETON:** -- based on Janet's breathing rate.  
23 Now we do have this little disconnect where you  
24 just can't scale it. You have to scale it for  
25 mouth breathing, which creates a higher

1 deposition, but yeah, I could -- I'm encouraged  
2 to say that -- 'cause that was pretty standard  
3 back in those days.

4 **MR. GRIFFON:** Which is actually --

5 **MR. RUTHERFORD:** Well, I was just laughing  
6 because how could someone remember that that  
7 was standard back in those days.

8 **DR. NETON:** I'm a walking encyclopedia of  
9 trivia at this point.

10 **MR. GRIFFON:** Actually for light work you were  
11 pointing out 9.6 was right.

12 **DR. NETON:** For light -- yeah --

13 **MR. GRIFFON:** Yeah.

14 **DR. NETON:** -- that's about right.

15 **MR. GRIFFON:** Right, yeah.

16 **DR. NETON:** Light -- light work. I keep  
17 forgetting that light work and light exercise  
18 are two totally different issues and they --  
19 they should have named them something else.

20 **MR. BELL:** They sure should have.

21 **DR. NETON:** Now I understand -- is that -- I  
22 think that's --

23 **MR. FITZGERALD:** I think -- yeah, I think --  
24 well, we'll take that one and look at that  
25 further and come back.

1           **MS. WESTBROOK:** This is Janet. I just wanted  
2 to ask Kathy what document said they used the  
3 ten cubic meters per day. I seem to remember  
4 that myself.

5           **DR. NETON:** 9.6?

6           **MS. ROBERTSON-DEMERS:** I have it with me and  
7 I'll let you see it. It's really dark, though,  
8 so you may not be able to read it real well.

9           **MR. FITZGERALD:** It's been copied a number of  
10 times.

11 I think number 12 we deferred to your coming  
12 back, just because it gets into an issue that  
13 actually we -- we had a lot of inquiry in the  
14 original procedures, if you remember back in  
15 the spring when we were going to look at the  
16 synergy issue because it was cited in the  
17 original reg, but I think decided to take that  
18 out -- that was one of the comments that we  
19 responded to -- and procedures, but this was --  
20 this sort of came in a back doorway. I'll let  
21 you describe it 'cause I don't know if I could  
22 give it justice, but in terms of why we  
23 mentioned this as a sidebar.

24           **MR. BELL:** Well, I think it started with our  
25 teleconference call. We were discussing dust

1 concentrations being 200 milligrams per cubic  
2 meter and the fact that that would be a point  
3 where it would cause chemical toxicity to the  
4 kidneys. And obviously we found probably the  
5 levels were lower than that. We discussed they  
6 probably were much lower than that, but still  
7 it brought up the issue -- well, if they were  
8 breathing heavy dust, then maybe there were  
9 some chemical toxicity problems. And although  
10 that's not -- that's not necessarily what we're  
11 dealing with here -- I mean in the law and  
12 everything -- people could sustain renal damage  
13 and nobody knows about it till later on in life  
14 when they have problems and, you know, go into  
15 renal failure and other things. It was just --  
16 it was kind of oh, by the way, rather than  
17 something you've got to pursue in great detail.  
18 But there -- as -- as I think Kathy mentioned  
19 earlier, in the very early period their main  
20 concern was the chemical reactions, the  
21 chemical problems they were dealing with. And  
22 the controls of radiation was poorly understood  
23 and they were mainly controlling a lot on the  
24 chemical toxicity issues. And so it's -- it's  
25 kind of a hard situation where you've got that

1           -- not to ignore it completely, but -- and we  
2           just felt we needed to say something about it.  
3           How effective we've done it or whether we need  
4           to modify it, we can certainly discuss that.  
5           But it's certainly -- kind of outside the realm  
6           of this, but it's a concomitant problem that  
7           may occur with heavy dust situations with  
8           uranium and people that look at it wonder why  
9           you haven't addressed it in some way. So I  
10          guess we need to think about an effective way  
11          to do that, you know.

12          **DR. NETON:** I can think of two organs where  
13          this is an issue, kidney, as you pointed out,  
14          and lung.

15          **MR. BELL:** Yeah, lung.

16          **DR. NETON:** And I guess my off-the-top-of-my-  
17          head thoughts on this are that if renal  
18          toxicity occurred because of the kidney  
19          plugging up -- the tubules plug up with uranium  
20          precipitates in there -- I suspect that the  
21          guy's going to get paid. I mean I don't think  
22          compensation's going to be an issue. And if  
23          anything, it would discourage clearance -- I  
24          guess it would tend to increase the dose a  
25          little bit if clearance were impaired, but

1 doses that would be high enough to cause kidney  
2 damage like that, I can't imagine --

3 **MR. BELL:** Pretty -- pretty ser-- yeah.

4 **DR. NETON:** I suppose what we could do is some  
5 sort of bracketing calculation would show as  
6 the concentration went up and kidney damage was  
7 more likely -- what is the dose and is that  
8 threshold exceeded by almost any -- any  
9 conceivable --

10 **MR. BELL:** Kind of rule it out?

11 **DR. NETON:** Yeah, rule it out based on that.  
12 Now the lung -- the lung damage I think  
13 actually works in favor of the claimant. If  
14 you load up the lung so much that the clearance  
15 is impaired, and we assume class M, then if we  
16 assume standard metabolic clearance, then your  
17 dose to the kind-- dose to the other organs  
18 would actually go down if we took into account  
19 the clearance impairment.

20 **MR. BELL:** Right.

21 **DR. NETON:** On the other side of the coin, if  
22 it was so high that it was plugged up that your  
23 clearance was impaired, I'm very certain -- 100  
24 percent certain, almost -- that all those cases  
25 would be paid for lung cancer using class Y.

1           It takes very little uranium in the lungs to  
2           get above a couple hundred rem. So I take the  
3           comment to heart. It's something that we can  
4           probably address with some bracketing  
5           calculations.

6           **MR. GRIFFON:** Just looking quickly at ICRP-66,  
7           I mentioned modifying factors before you got  
8           here, and I think I agree that the -- you know,  
9           it would increase the lung doses, but that  
10          really doesn't mat-- you know --

11          **DR. NETON:** It doesn't really matter.

12          **MR. GRIFFON:** -- it's not going to matter for  
13          many cases.

14          **DR. NETON:** And then it would decrease --

15          **MR. GRIFFON:** And all the modifying fac--  
16          almost all the modifying factors are less than  
17          one, meaning inhibiting the clearance.

18          **DR. NETON:** Right.

19          **MR. GRIFFON:** Sulfuric acid is listed, though,  
20          just to say I thought acids were listed on this  
21          table, and that is one -- and bronchitis --  
22          chronic bronchitis is listed as a modifying  
23          factor, just FYI.

24          **DR. NETON:** But that being said, I think that  
25          we're aware of some very unique situations. We

1           have one case where I believe we did a thyroid  
2           dose calculation -- no, we used the thyroid as  
3           the highest non-metabolic organ. It turns out  
4           that the person had a thyroidectomy several  
5           years prior, so it really wasn't relevant that  
6           we calc-- we used the thyroid as a surrogate  
7           for the highest exposed organ, and he  
8           rightfully complained that I don't have a  
9           thyroid. So you know, we need to -- you know,  
10          it didn't change the compensability decision.  
11          And I'm not making light of his thyroidectomy,  
12          but we do need to take into consideration, you  
13          know -- we need -- if a person has one lung,  
14          for example, you know, then certainly if they  
15          had an inhalation, we need to account for how  
16          that may have changed.

17          **MS. WESTBROOK:** This is Janet. You know, Mont  
18          Mason pointed out in his retrospective look in  
19          HASL-58. He said that albuminuria in 18 cases  
20          has been followed up and in every case the  
21          causative agent was found to be something other  
22          than the occupational environment. However --  
23          however, you might be able to find those in the  
24          records if you wanted to compare them to the  
25          best levels at the time, and also -- just in

1 case somebody wanted to do a study -- you know,  
2 in Harshaw they actually took some of the  
3 workers over to a New York hospital and studied  
4 them there in addition to -- so there's  
5 probably a lot of medical records for these I  
6 think five people. So again -- and then they  
7 have the dust studies for that time, as well.  
8 That was US6 on Harshaw and this is other  
9 stuff. But anyway, just for your future --

10 **DR. NETON:** Right.

11 **MS. WESTBROOK:** -- consideration, that might be  
12 possible just to do a spot check for a site  
13 based on who they found those early kidney  
14 symptoms in.

15 **DR. NETON:** I think it might -- might -- that's  
16 a reasonable suggestion, but from a practical  
17 dose reconstruction perspective, if we did come  
18 up with a dose and -- you know, if we came up  
19 with an intake that was huge and it could  
20 likely impair kidney function, we could look at  
21 it. If it didn't for some reason go over 50  
22 percent, we could certainly try to accommodate,  
23 to the extent possible, what that may have  
24 meant, that lack of clearance and that sort of  
25 -- that makes some sense.

1           **MS. WESTBROOK:** This is Janet. I just wanted  
2 to mention, they did regular urinalysis where  
3 they like checked for albumin or whatever, long  
4 -- like from 1943, say, on -- before they --  
5 maybe even '42 on -- before they started the  
6 radioactive urinalysis. So if you wanted like  
7 an early indicator of levels, like -- like just  
8 to see if you had a bunch of workers who were  
9 showing signs there, those records might be  
10 available.

11           **MR. BELL:** Where would they be?

12           **MS. WESTBROOK:** I do not know, but I assume  
13 they might be submitted by a claimant or, if  
14 you ever found the medical records of Harshaw,  
15 they --

16           **MR. BELL:** Oh, I see.

17           **MS. WESTBROOK:** -- paid for these --

18           **MR. BELL:** So they'd be in their individual  
19 file.

20           **DR. NETON:** The problem with those protein  
21 albuminuria --

22           **MS. WESTBROOK:** Right, right.

23           **DR. NETON:** -- I think results, they're quite  
24 variable and is that really the ultimate  
25 endpoint of kidney dysfunction. There are many

1 other, more sensitive indicators nowadays that  
2 look at enzyme function impairment and that  
3 sort of thing. So this has been a debate in  
4 the uranium toxicology business for decades as  
5 to what is the -- what is the right method to  
6 look at kidney impairment. What is the no-  
7 effect ratio. What should that be based on.  
8 You kind of get into a very spotty realm there  
9 and I'd rather stay away from trying to  
10 redefine that.

11 Well, great progress, I guess. That begs the  
12 question, is there a reason to convene tomorrow  
13 to wrap up a few points? I mean everybody's  
14 probably stuck here for the night anyway.

15 **MR. FITZGERALD:** Yeah, we're stuck here for the  
16 night. What I would propose is -- there's  
17 probably a couple of clarifying discussions  
18 that we still need to have as we finalize the  
19 report. You may, in the course of trying to  
20 characterize the meeting, what have you -- may  
21 want to likewise contact, so why don't we  
22 assume that's going to happen.

23 **DR. NETON:** Right.

24 **MR. FITZGERALD:** We may want to talk further on  
25 the nasal clearance issue, the breathing rate,

1           tomorrow. We're going to, I suspect, be stuck  
2           here anyway.

3           **DR. NETON:** That's fine.

4           **MR. FITZGERALD:** We may want to either call or  
5           swing by -- I guess either way, depends on  
6           what's easier, and we'll certainly call you in  
7           any case if we need to do that, just to keep  
8           things moving along, if we can do that.

9           **DR. NETON:** Okay, let me see if I understand  
10          what you --

11          **MR. GRIFFON:** What does this mean for Ray?

12          **DR. NETON:** You want to reconvene here tomorrow  
13          morning?

14          **MR. FITZGERALD:** I would suspect -- no, we  
15          don't need to have everybody be in sort of a  
16          cap-- a captive audience for a continued  
17          discussion on breathing rate, no. But if we  
18          have further questions or want to, you know,  
19          try to reach closure on that, then we might  
20          want to have additional discussion, but not  
21          anything that would affect the record, but just  
22          simply to clarify what -- we're probably going  
23          to need to, I think, close out on that  
24          particular point as part of the process of  
25          responding to your characterization of this

1            thing. So we're going to have to -- you know,  
2            we're not going to leave it unresolved, but I  
3            think we don't need to have a -- you know,  
4            convene the whole group just to close on that  
5            one issue. It may take a little longer than  
6            tomorrow I guess to even settle that out from  
7            our standpoint. So we'll use the -- I think  
8            use the -- the piece that you're writing and  
9            we're responding to as the means to close that  
10           out, and that'll be certainly available to the  
11           Board before the St. Louis meeting, I would  
12           hope. Is that kind of the plan?

13           **DR. NETON:** That's the plan.

14           **MR. FITZGERALD:** Okay. So I think that's the  
15           way we can at least reflect on that.

16           **DR. NETON:** We're going to try our best to get  
17           that.

18           **MR. FITZGERALD:** Because we would want to have  
19           the report finalized and we need to at least  
20           have that issue addressed somehow, so we're  
21           going to have to close on that, one way or the  
22           other.

23           **DR. NETON:** Okay.

24           **MR. FITZGERALD:** I think on -- my sense is  
25           that's the one -- if -- if -- unresolved

1 question of the whole project. I think the  
2 rest of them I think we've pretty well -- one  
3 way or the other have a pathway and -- and  
4 either in clarify information, you know, change  
5 things around one way or the other. But I  
6 think that's one issue, if I can say, is  
7 unresolved in this discussion.

8 **DR. NETON:** Okay. So do you want to use our  
9 conference room tomorrow or do -- are you guys  
10 going to meet at the hotel?

11 **MR. FITZGERALD:** I mean I think we can probably  
12 just stay at the hotel. I don't think -- I'm  
13 just saying physically we don't have to get  
14 everybody together --

15 **DR. NETON:** Okay.

16 **MR. FITZGERALD:** -- for that one single issue.  
17 I think we pretty much understand -- or -- am I  
18 right? Or maybe -- do we need any more  
19 clarification on that one point?

20 **DR. NETON:** I guess I should ask the rest of  
21 our group here, does anybody feel the need to --  
22 -- some of their issues have not been discussed  
23 today or issues raised that need to be raised?  
24 No? Okay. Well, then --

25 **MS. WESTBROOK:** I did have one question. One

1 generic question that I had back as a result of  
2 reading all this was -- you know, this is a  
3 philosophical question. How detailed should  
4 individual recon-- dose reconstruction go?  
5 See, because that influences my TBD where I'm  
6 sitting there trying to tell the dose  
7 reconstructors everything you absolutely need  
8 to know about the site, but then so much has to  
9 be left to their discretion. See? So I'm  
10 trying to hit the happy medium between way too  
11 much information and not enough information,  
12 and so if y'all would kind of maybe think of  
13 this philosophical question. You know, when a  
14 dose reconstructor is doing a tailored,  
15 individual dose reconstruction, either only  
16 external, only internal, both or whatever, how  
17 much -- not -- not in time, like in hours, but  
18 I mean how much level of effort is that  
19 conceived to be, in -- just in your sort of  
20 view, because that kind of influences what we  
21 think of as realistic amount of time that we're  
22 going to be expected to spend in order to  
23 satisfy ET4.

24 **MR. FITZGERALD:** Well, I guess two observations  
25 -- I think Kathy and Tom would have much more

1 hands-on perspectives -- but one perspective is  
2 I think, as Tom mentioned earlier, perhaps in  
3 terms of a hands-off -- one comment I thought  
4 was particularly important was the dose  
5 reconstructor having a clear understanding of -  
6 - in this case it was a table, but you know,  
7 just really being able to interpret the  
8 information before them and sort of having the  
9 qualifications and -- as well as the  
10 application be clear. And I think that's a --  
11 that's a subjective thing. And I think the job  
12 that's been done has been a real good job. I  
13 think what we're pointing out is some areas  
14 where the understanding could be clearer. Not  
15 so much for the lay person, but even -- and  
16 more importantly, for the dose reconstructor to  
17 interpret and to carry forward. I think that's  
18 one thing that we're particularly in tune with.  
19 Can a health physicist take this and, from a  
20 self-evident standpoint, know what to do with  
21 it. In some case, and I think the point was  
22 very well raised by Jim, that if -- if one of  
23 us couldn't figure out how to take that  
24 information and convey it into perhaps a dose  
25 reconstruction, maybe that would be an issue as

1 far as the clarity and detail of the  
2 information in the TBD, without pushing the TBD  
3 to be something that it shouldn't be. And so  
4 there's a bit of a judgment involved in that.  
5 The other thing is a question of perhaps being  
6 too generic in terms of the -- of the  
7 information, the model, whatever that would be  
8 applied. It may not -- and again, we've gone  
9 back and forth. There's no magic formula. We  
10 don't want to tailor this to the extent that  
11 it's going to become so complex and so arduous  
12 that it can't be applied readily.

13 On the other hand, if it's overly-generic and  
14 overly one-size-fits-all, then I think there's  
15 a chance that there's going to be groups of --  
16 or workers missed, perhaps, and I think that's  
17 something that everyone's vigilant over and,  
18 you know, this question of how conservative  
19 does one need to be to do that, I think that's  
20 always going to be something to look at. And  
21 we'll be certainly challenging that thesis all  
22 the time, but I think that's a fundamental  
23 question. You know, it sort of gets down to  
24 the point that was discussed before, the  
25 efficiency and ease of application,

1           understandability versus tailoring, and where  
2           is that happy balance point.

3           But those are my two observations and I think  
4           that's going to be two running themes that you  
5           might glean from our discussion is that, you  
6           know, we're kind of looking into trying to look  
7           at the balance between what's trying to be  
8           accomplished and the efficiency and the ease of  
9           application versus does it in fact envelope  
10          what it should cover or not. And there's no  
11          format. I mean I think it's always going to be  
12          one of judging the information and figure out  
13          the pragmatic part of it, and making sure that  
14          we're not, you know, coming up with something  
15          that sure looks good, but it's not practical or  
16          pragmatic at all. And that's -- that's  
17          something we'll I think continue to go back and  
18          forth on.

19          I don't know if Tom or --

20          **MR. BELL:** That's a good summary.

21          **MR. FITZGERALD:** Okay. Well, thank you very  
22          much. As I felt last week, these have been  
23          very fruitful exchanges. It certainly has  
24          pushed our work forward a lot faster and more  
25          efficient, I might add, and will enable us to

1 provide what we need to provide to the Board  
2 and keep pace with their schedule. So I think  
3 everybody wins.

4 We will try to turn around whatever you send us  
5 as far as representing what's happened here as  
6 fast as we can so that that can also get on the  
7 record. Probably need to give this -- the  
8 inhalation issue more thought. It's one that's  
9 got some policy implications associated with it  
10 and we need to think that thing through. The  
11 rest of it I think, if I might characterize,  
12 some of it's representational, how we represent  
13 the adequacy of data without inadvertently  
14 getting into SEC territory. I think that's a  
15 legitimate issue and we're going to have to  
16 look at that. I think a lot of it's how we  
17 present our conclusions and our findings versus  
18 the substance. I think we need to say what  
19 we're going to say, but I think we've got to be  
20 careful how we say it. I think we also  
21 addressed that as a -- there's a couple of  
22 other places, so we'll go back and take a look  
23 at how that's represented and be careful about  
24 that. And that follows through for future --  
25 future reviews. I think that has some value as

1 we go along.

2 I think that's about it. Is there anything  
3 else that --

4 **MR. BELL:** I can't think. You covered it  
5 pretty well, thank you.

6 **MS. HOMOKI-TITUS:** Jim?

7 **DR. NETON:** Yeah, Liz.

8 **MS. HOMOKI-TITUS:** I want to talk about  
9 tomorrow. Is Ray supposed to be there to  
10 transcribe tomorrow, as well?

11 **DR. NETON:** I don't believe -- well, he is  
12 supposed to be, that's --

13 **MS. HOMOKI-TITUS:** I'm a little concerned about  
14 not having this as a meeting that's transcribed  
15 since we've made a commitment now to transcribe  
16 all these work group meetings, all that kind of  
17 stuff.

18 **DR. NETON:** Well, we're not meeting tomorrow.  
19 There is no formally planned meeting tomorrow.  
20 There may be a discussion on one isolated  
21 issue, which is an interpretation issue. We'll  
22 do whatever makes --

23 **MR. FITZGERALD:** But it's not going to be an  
24 issue that's going to add to or interpret  
25 what's already been said on the record. We're

1 going to be thinking about this and if -- you  
2 know, if we need to ask for further  
3 clarification, we may do that, but it won't  
4 change anything for the record.

5 **DR. NETON:** For the record, we've identified  
6 the issue. SC&A is going to back -- to get  
7 clarification, and then if anything, they'll  
8 provide that clarification to us.

9 **MR. FITZGERALD:** We will provide the issue for  
10 closure as a validation of the position piece  
11 or -- that represents what happened at this  
12 meeting that NIOSH is going to develop and send  
13 to us for review. And within that review we  
14 can go ahead and resolve that issue as to where  
15 it stands, if we haven't done so before then.

16 **MS. HOMOKI-TITUS:** That's fine.

17 **DR. NETON:** Okay, good.

18 **MS. HOMOKI-TITUS:** I just wanted to make sure  
19 if you guys were going to have any kind of  
20 lengthy discussion that we were not being  
21 untransparent.

22 **DR. NETON:** No, we will not do that. I guess  
23 from my end, I'd like to thank everyone for  
24 coming, and the Board in particular, I think.  
25 I hope that it's been useful for the Board

1 members to participate. From our perspective,  
2 it's very valuable. I'd like to thank the ORAU  
3 folks for coming and the SC&A folks. I think  
4 from our perspective, we're going to have some  
5 kind of minutes of the meeting put out to you,  
6 and hopefully within a short time frame, like  
7 the next couple of days, if we could do that.  
8 These are not going to be extensive, verbatim  
9 minutes, but merely just the discussion topic  
10 with maybe, you know, general points of  
11 agreement, disagreement, and some action items.

12 **MR. FITZGERALD:** That'd be very helpful.

13 **DR. NETON:** Just so that we can get that  
14 feedback going so that if there is a big,  
15 outstanding disagreement we have on what we  
16 agreed to, we'll get that on the table.

17 **MR. GRIFFON:** Are you going to circulate that  
18 to the Board?

19 **DR. NETON:** And we'll circulate that to the  
20 Board, as well, for comment. I mean we'll put  
21 them out for comment -- yeah, because the Board  
22 -- certainly they were participants.

23 **MR. GRIFFON:** Right.

24 **DR. NETON:** And then following that, we'll have  
25 our formal comments on the --

1           **MR. FITZGERALD:** Okay, so that would be an  
2           intermediate product --

3           **DR. NETON:** Yeah, the intermediate product is a  
4           quickly -- get out to you in a few days time  
5           frame and I have some people cringing here, but  
6           we'll try in good faith to get this out to you  
7           so that, you know, we can identify any --  
8           quickly any issues where we just really didn't  
9           understand each other.

10          **MR. FITZGERALD:** Okay.

11          **DR. NETON:** And then we'll get the formal  
12          responses out the door as soon as we can.

13          **MR. FITZGERALD:** Okay.

14          **DR. NETON:** And with that, I think we're done.  
15          (Whereupon, the meeting adjourned at 4:45 p.m.)

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C E R T I F I C A T ESTATE 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 18<sup>th</sup> day of January, 2005; 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 31st day of January, 2005.

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STEVEN RAY GREEN, CCR

CERTIFIED MERIT COURT REPORTER

CERTIFICATE NUMBER: A-2102